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The Role of Financial Resilience Aided by Fintech in Limiting the Community Spread of Covid-19: International Evidence

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Abstract

Using evidence obtained during 2020, we observe an inverse trend between country level uptake of Fintech practices and regulations and intensity of Covid-19 infections and fatalities. We observe an increase in use of digital payments, e-wallets, and a reduction in use of cash, a suspension of fees relating to monetary transfers particularly in countries that have more rigorous controls relating to Covid-19 during the first six months of 2020. Fintech increases financial resilience in countries which enables people to withstand short-term and temporary loss of income. Lockdowns and stoppage of economic activities induced short-term hardships on the population. Consequently, populations with higher financial resilience were better equipped and able to bear the unexpected and sudden economic hardships and abided by those. Complying with strict lockdown measures limited the community spread of Covid-19. Hence, we hypothesize that countries with higher adoption of Fintech in their lowest socio-economic strata will have lower cases of Covid-19 infection cases and deaths.

Keywords: Covid-19, Fintech, Financial Resilience, Globally, Mobile Payments
JEL: G21, G28, I18, O33, E42

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1. Introduction

This paper adds to the growing body of research that studies how different aspects of internet-usage, patterns and the extent of penetration in the society can be used to track, predict and prevent the spread of infectious disease (Aiello et al 2020). This stream of research has operationalized Google searches (Ginsberg et al 2009), Twitter posts(Garzón-Alfonso & Rodríguez-Martínez, 2018), Facebook likes (Gittelman et al. 2015), Wikipedia searches (Generous et al. 2014) and Instagram posts (Correia et al. 2016). In this study, we investigate the impact of Covid-19 pandemic in use of financial technologies (Fintech) globally. In particular, many electronic transaction and payments, including mobile banking and other Fintech facilities are important social distancing mechanisms designed to facilitate business transactions at the same time as minimizing the risk of increasing infections (Aditya et al. 2019, Baker 2018). Aprigliano, Ardizzi and Monterforte (2019) argue that electronic payments are a unique source of information for short-term forecasting and can be used to assess the impact of Covid-19 on spending patterns of consumers.

In this paper, we provide evidence on the acceleration of digital transformation by documenting the early impact of Covid-19 on Fintech adoption worldwide. Moreover, the nature of the Fintech market generally gives providers greater flexibility to quickly deploy new products and services or adapt or scale existing ones, in response to shocks (Fuster et al. 2019). We extract information pertaining to seven Fintech announcements from the World Bank from January 1st 2020 to July 30 2020 for 130 countries. The countries in our sample cover all global regions and account for approximately 80 percent of the global population and over 90 percent of the world economy in terms of nominal GDP.

We are motivated in this study to examine the relation between the spread of the Covid-19 pandemic and use of Fintech for several reasons. The pandemic is likely to lead to significant changes in the provision and use of financial technologies. The demand, necessity and regulation of Fintech will change as a consequence of Covid-19. For instance, the development and application of new financial technology will enhance digital business strategies when it is not possible to conduct conventional face to face business. Fintech is likely to assist with the timeliness and provision of better-quality information which is likely to generate a whole range of financial reporting benefits.

Fintech increases financial resilience in countries which enables people to withstand short-term and temporary loss of income. Lockdowns and stoppage of economic activities induce short-term hardships on the population. Consequently, populations with higher financial resilience are better equipped and able to bear the unexpected and sudden economic hardships and are better able to abide by those. Compliance with strict lockdown measures limited the community spread of Covid-19. Hence, we hypothesize that countries with higher adoption of Fintech in their lowest socio-economic strata will have lower cases of Covid-19 infection cases and deaths. Using evidence obtained during 2020, we find that there is an inverse relation between country level uptake of Fintech and intensity of Covid-19 infections and fatalities.

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We contribute to the literature in a number of important ways. To the best of our knowledge, this paper is the first that shows recent trend of using of Fintech during the Covid-19 Pandemic. Second, we contribute to the literature by investigating whether societies with greater penetration into information age fared better in dealing with the spread of the pandemic. We use adoption of Fintech as a proxy to ascertain individual's ease of access to real-time information, and the society's ability to harness the power digital technology in instituting data-based sound policies. We use measure of how the pandemic spread and how quickly was it isolated and controlled as a measure of the effectiveness of government response to the crisis. Third, the current literature on the benefits of Fintech adoption has been limited to financial benefits in terms of reduction of fees and penalties paid to banks. Our study is unique in that it measures indirect and unintended benefits on how the infrastructure supporting Fintech and the consequent change of individual behaviour may help societies and individuals abate the spread of the pandemic in those societies.

2. A Primer on Fintech

Fintech comprises of companies that use technology to make financial services more efficient. Fintech is broadly defined as any innovation in financial services, from mobile banking to crypto currencies. Alt and Puschmann (2012) define Fintech as new solutions which demonstrate an incremental or radical / disruptive innovation development of applications, processes, products or business models in the financial services industry.

Broadly the Fintech products include: 1) Innovations in the banking sector that facilitates internet banking, cashless transactions and mobile banking. 2) Innovations in the insurance sector related to obtaining remote insurance quotes, filing of claims on internet and automated settlement of damages. These are also referred to as "InsurTech". 3) Technological innovations to facilitate investment advisory services and wealth management services. 4) Remote and contact-less applications and approval of credit and loans. 5) Crowdfunding and crowd sourcing applications. These include business-to-business (B2B), business-to-consumer (B2C) or consumer-to-consumer (C2C) products (Amini, 2023; EY, 2019).

Fintech has emerged in every major regions of the world in both developed and developing economies. The rate of adoption, or widespread use, of Fintech differs considerably. While Fintech remains a small proportion of any country's GDP, in some economies the growth in Fintech has been significant and it is moving into the mainstream of financial services. Demographics play a critical role in the popularity of Fintech in a society. Younger generations are more likely to adopt Fintech services.

One of the areas in which Fintech has grown significantly is in mobile payment for retail purchases. However, there is great disparity in its usage. For example, mobile payments constituted 16% of GDP in China, but less than 1% in United States, Brazil and India. Regulation in the country could aid or hinder the growth and adoption of Fintech. Consequently, growth of Fintech in a particular country may be indicative of flexible and adaptable regulatory structure, an infrastructure for quickly responding to the pandemic.

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Fintech services are faster, more efficient, and typically cheaper than traditional financial services and, therefore, increasingly reaching lower-income households and small- and medium-sized enterprises (SMEs). Regions where digital financial inclusion is advanced, efficient and quick deployment of government support measures are facilitated. Fintech has helped people and firms to maintain and increase access to financial services during lockdowns and the reopening of businesses. Thus, an unintended positive consequence of Fintech was in limiting the community spread of Covid-19 in low-income countries by enabling cashless and contact-less transactions.

3. The Spread and Containment of Covid-19

The virus, which causes the respiratory infection Covid-19, was first detected in the city of Wuhan, China in late 2019. The outbreak spread quickly across the globe and on March 11, 2020 the World Health Organization declared it a global pandemic—implying that the disease was infectious and communicable with the potential of simultaneously spreading across many parts of the world.

Though the virus started in China and initially spread to other parts of Southeast Asia, it soon spread to Europe, then to North America, South America and the Indian sub-continent. The containment of Covid-19 in these regions has varied widely. The nations initially affected by Covid-19, China and other Southeast Asian countries, responded promptly and effectively to contain the virus. However, the nations affected subsequently, in Indian subcontinent, North and South America, were unable to contain the spread and the cases of infections and deaths grew in these countries. As of end of August 2020, there are around 25 million confirmed cases of Covid-19 in 188 countries with about 850,000 deaths.

The spread of Covid-19 has been uneven across various regions of the world. While some of the earlier affected countries were better able to contain the spread, the countries that were impacted later had a much higher community spread. Some countries have experienced a second surge of the virus, seemingly having controlled the initial outbreak. Notably Australia, Israel, South Korea have experienced second surge which surpassed the initial peak. Parts of Europe, particularly Spain, Greece, Czech Republic, Italy and France, that were affected early and had contained the spread are experiencing a second surge as of end of August 2020.

The growth rate of infection has been exponential. As can be seen in Figure 1, while it took 38 days for infections to increase from five million to ten million globally, and it took only 20 days to increase from 15 million to 20 million.

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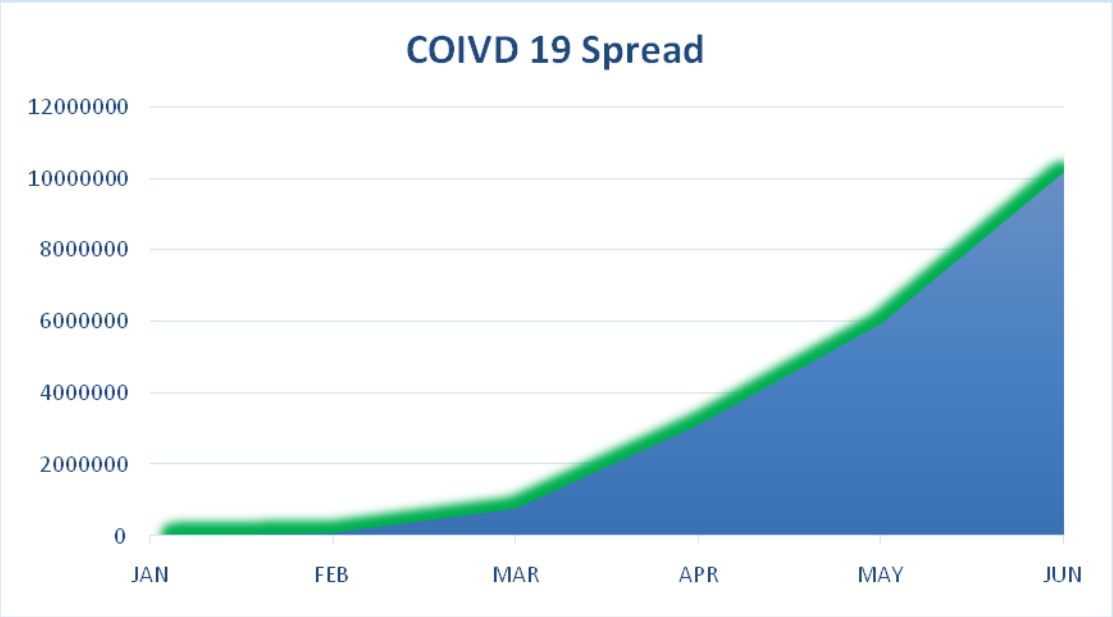
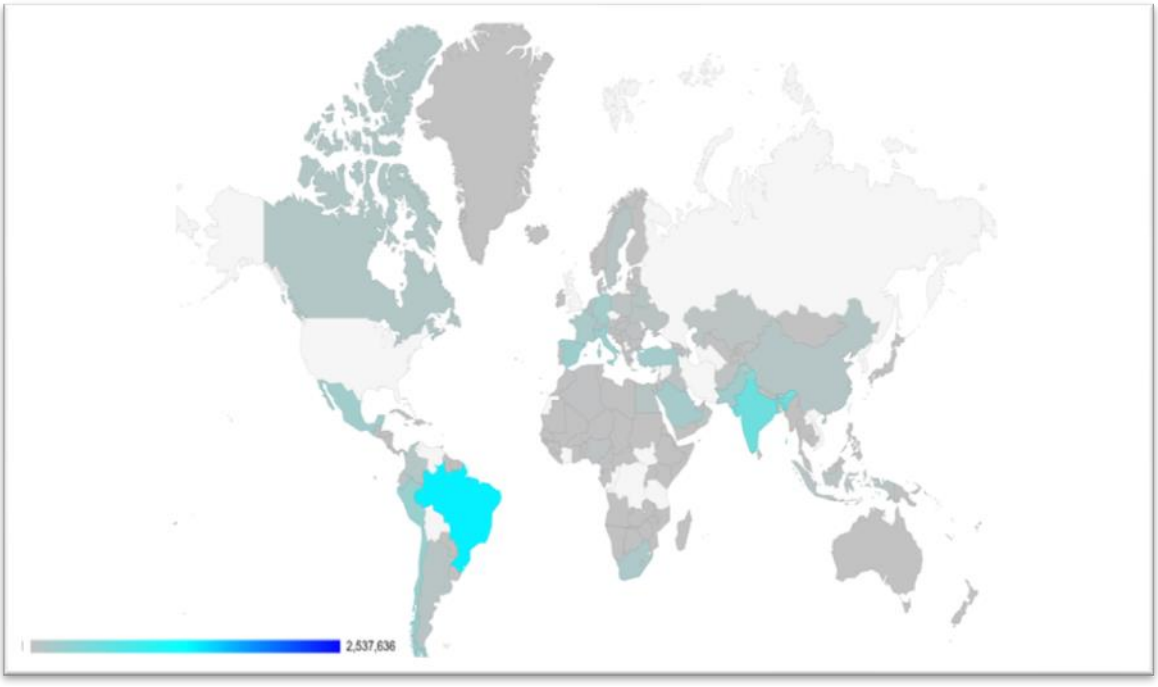
Figure 1: COVID 19 Spread From January to End June 2020



(Source: WHO 2020)

Figure 2: COVID 19 Spread End June - Worldwide



In every region of the world, except for the source China, the first cases of infection were those of overseas travellers, that is, the person was infected while traveling overseas. These overseas

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travellers, if asymptomatic and hence not quarantined, spread the virus with those they came in contact with leading to community spread. The infection was soon locally acquired, that is the infected person had not travelled overseas and was infected in their home country by having come to contact with someone with the virus who also had not travelled abroad. The countries that were able to effectively contain community spread of the virus were those that instituted effective quarantine of overseas travellers thereby minimizing the possibility of interaction between local populace and potentially infected travellers. The Covid-19 spread as at June 2020 end is depicted as Figure 2.

To forecast the geographic spread of communicable disease such as Covid-19, it is beneficial to know which individuals are likely to physically interact, this is known as 'contact tracing' (Aleta et al., 2018). Generally, people interact within their social networks, hence the infection is expected to spread through socially tight-knit communities. Kuchler, Russel and Stroebel (2020) aggregated data from Facebook to measure 'social connectedness' between geographic regions. They showed that this measure helped in the forecast of the geographic spread of Covid-19 around the New York metro area as well as through Italian provinces. Regions connected through many friendship or social network links, increased potential of interactions between residents, thereby providing more opportunities for the spread of the virus.

Our study takes a different slant to the above stream and we investigate a different motivation for people to congregate and intermingle—trade and commerce. We study the mitigating effects of technology that obviates the need of physical interaction in order to transact. Fintech enables one to reap benefits of trade of commerce while avoiding physical interaction or proximity. In fact, studies show that there was a spike in electronic commerce and Fintech in many regions across the globe. For example, there is empirical evidence that number of mobile banking agents increased by 10% in Kenya from March to May 2020, suggesting that Covid-19 pandemic has facilitated consumers' on-boarding into the Fintech space. Estimate increases in mobile banking transactions were observed as well as value per transaction (Tut 2020).

At the onset of Covid-19, the precautionary measures included social distancing, limited interactions and cashless transactions. In low-income countries large proportion of population deprived of traditional banking, hence there is a predominance of face-to-face commerce transacted in cash. In these societies, most notably Brazil and India, it has been difficult to enforce and implement effective social distancing leading to widespread infections that have travelled all over the populous countries. Thus it is interesting to note that the spread of Covid-19 was limited in Sub-Saharan Africa despite the poverty, inaccessibility to banking channels and strong social networks. Coincidentally, the Fintech penetration in these regions are substantive which potentially enabled the populace to promptly resort to social-distancing protocol while still engaging in essential commerce such as purchasing of food, medicine and other essentials. Furthermore, Fintech potentially enhances financial resilience in communities by encouraging savings and also providing easily accessible credits. Enhanced financial resilience allows populations to better withstand temporary loss of income and thereby increases compliance with lockdown and other restrictions to curb the spread of this communicable disease.

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4. Covid-19: A new Global Path of Fintech Development

During the pandemic many countries have promoted the use of Fintech by introducing measures to lower cost and increasing the limits on transactions for digital transactions. These developments could help accelerate the shift toward digital financial services. For instance, the severe acute respiratory syndrome (SARS) epidemic in 2003 accelerated China's launching of digital payments and e-commerce. By reducing or eliminating the need for physical interactions and the need for cash, Fintech is helping governments reach—quickly and securely—people and businesses with various forms of income and liquidity support for example mobile networks are used in Uganda and Zambia.

For many years, regulators and policymakers found themselves unable to achieve the right balance between enabling Fintech and safeguarding the financial system. This balance has been considered a priority after the spread of Covid-19. Fintech's potential to enable innovation and efficiency by ensuring business continuity, prevent service disruptions, and increase financial and economic stability while keeping risks in check is being widely recognized. Fintech and digital payment systems offers rapid and secure way for governments to disburse funds tounder-served entities. Disruptions caused due to Covid-19 has fast tracked reforms pertaining to Anti-Money Laundering and Counter-Terrorism Financing (AML\CTF).

Covid-19 is changing the evolution of the Fintech industry. Given the extreme focus on cashless payments and digital identification methods to avoid human interaction, countries are promoting digital payments, signatures and remote identification. Several central banks and monetary regimes in Europe, Africa and Middle East have announced reforms to facilitate and promote the use of digital payments. UK Financial Conduct Authority has asked firms to accept selfies for client identification. The Financial Action Task Force is also promoting the use of digital ID technology to securely enable remote on boarding and financial services. Similar reforms have been applied in Spain.

Fintech has been widely adopted in parts of Africa. By some estimates, 80 percent of its population uses mobile banking for obtaining loans and peer-to-peer lending (Jack and Suri 2014). In response to Covid-19, Kenya and Uganda cut mobile money fees, increased limits on various transactions. Likewise, The Bank of Zambia announced monetary policy measures to safeguard financial system stability and promote the greater use of digital financial services. In Nigeria, the central bank has urged the public to limit the use of cash and instead use digital means, including mobile money.

In Asia, the central bank of the Philippines encouraged the use of e-payments amid enhanced community quarantine (ECQ) to minimize face-to-face transactions and suspended fees for standard services. Bank Indonesia (BI) has waived and reduced various transaction fees, particularly those impacting micro-business. Thailand announced stimulus which will remit social security fund either via direct transfers or through electronic wallets, including Prompt Pay. Pakistan promoted use of digital channels through social, print and electronic media and are conducting tax waivers strategy in order to incentivize remote banking. Bangladesh has

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instructed Mobile Financial Service providers to offer free cash-out for nominal and medical expenditures.

Similar measures related to Fintech have been undertaken in Middle East & North Africa. Saudi Arabian Monetary Authority required its financial institutions to encourage their customers to conduct financial transactions through digital channels. , Jordan, promoted entrepreneurship in Fintech by establishing a Fintech Regulatory Sandbox 2020. Egypt increased transaction limits for mobile financial services and cancelled fees to achieve higher rates of financial inclusion.

5. Research Design

5.1 Data and Sample

We obtain data on seven Fintech variables (see Appendix A) based on government circulation obtained from World Bank data catalogue entitled "COVID-19 Finance Sector Related Policy Responses". We read each circular regarding the Fintech then we categorise them into main 7 variable in Appendix A. The Fintech circulations usually announced by Central Banks around the world covering more than 130 countries over the period 1 January 2020 to 30 July 2020.

5.2 Results

We analyze the adoption of Fintech innovations during the substantive Covid-19 infection period of 2020 to assess the relation between Fintech adoption and its relation to geographical domains infected by Covid-19. The Fintech innovations under examination are: use of digital payments, use of e-wallets, relative cash use, suspension in fees relating to payment transfers,

biometric verification, use of mobile transactions and easement of transaction limits. We provide Figures that map the countries that have implemented each of the aforementioned Fintech innovations over the 7 months ending July 2020 coinciding with the time over which the bulk of the infections were recorded. The uptake of each of these Fintech innovations is discussed as follows. We divide the announcement into two types of announcement. First Fintech e-payment incentives and second Fintech restriction removal.

5.3 Central Bank circulars on Fintech e-payment incentive

Table 1 and Figure 3 maps three types of government circulars based on Fintech e-payment incentives comprising digital payments, use of e-wallets and cash reduction based on country income type categories (GDP).

Table 1: Fintech circulars-based e-payment incentive

Income Category	Digital Payment	e-Wallet	Cashless	Total
Low income	54	5	8	67
Lower middle income	46	3	11	60
Upper middle income	32	7	3	42
High Income	15	1	3	19
Total	147	16	25	188

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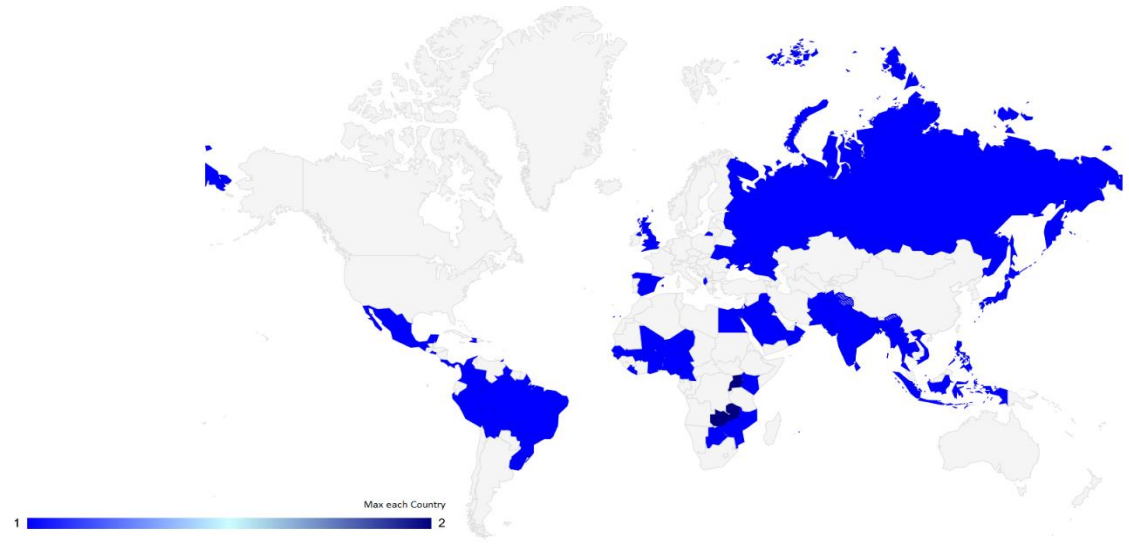
Figure 3: Distributions of Fintech e-payment incentives Worldwide.



5.3.1 Use of Digital payments

Globally, the geographic domains where higher levels of digital payment announcements are evident are Russia and Eastern Europe, South Africa, Middle-Africa, the Middle East South-East Asia and Central and South America and in particular Brazil.

Digital Payment announcements relative to average national income category during the period from February 2020 to 31 Jun 2020 are provided in. Globally, the geographic domains where higher levels of digital payment announcements based on income payments are evident are Russia and Eastern Europe, South Africa, Middle-Africa, the Middle East South-East Asia and Central and South America and in particular Brazil.

5.3.2 Central Bank circulars on use of e-wallets

Use of e-wallets during the period from February 2020 to 31 June 2020. Globally, the geographic domains where higher levels of e-wallet use are evident in Saudi-Arabia and central Africa. Use of e-wallets scaled over income category during the period from February 2020 to 31 Jun 2020. Globally, the geographic domains where higher levels of e-wallet use based on income category are evident in Saudi-Arabia and central Africa.

5.3.3 Central Bank circulars on cash reduction

Central Bank circulars on cash reduction during the period from February 2020 to 31 Jun 2020 are provided in Table 1 and Figure 3. Globally, the geographic domains where higher levels of cash reduction use are evident in Egypt, central Africa, Western Europe, the UK, the Sub-continent and Southeast Asia. Central Bank circulars on cash reduction usage based on country level income category.We observe a similar pattern in countries that have announced a reduction in cash, and they largely include lower income countries in the subcontinent, Africa and Southeast Asia.

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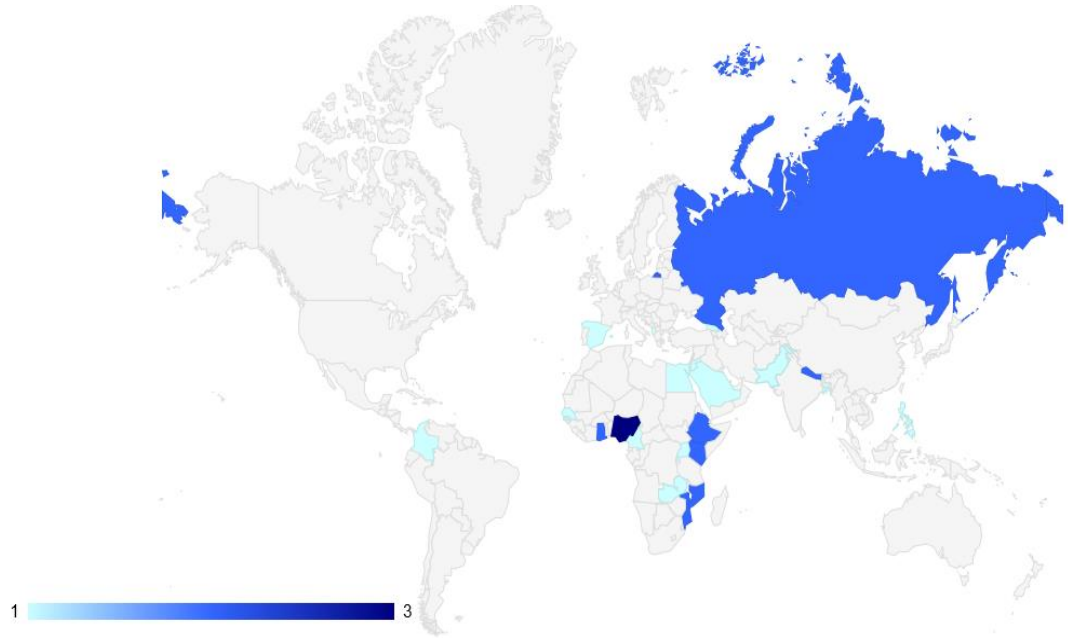
5.4 Fintech improvement and restriction removal

Table 2 and Figure 4 shows government announcements related to Fintech improvement policy and restriction removal. This includes policy related to money transfers/waived fees for platform and mobile payments (Suspend Fee Transfer). Circular policy relates toencouragement of use Raise Mobile Transaction (Mobile Transaction), easing the limits on transactions for corporate and agents (Ease Limit), and biometric verification/customer authentication (Biometric verification). Upper middle-income countries record 36 circulars designed to improve Fintech practices and to remove money restrictions followed by lower middle income countries.

Table 2: Fintech improvement and restriction removal

Income Category	Suspend Fee Transfer	Mobile Transaction	Ease Limit	Biometric verification	Total
Low income	5	4	0	0	9
Lower middle income	7	2	1	1	11
Upper middle income	19	13	4	2	38
High Income	2	0	1	0	3
Total	33	19	6	0	61

Figure 4: Distribution of government announcement related to Fintech improvement policy and restriction removal worldwide.



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5.4.1 Fee suspension on money transfer

Globally, the geographic domains where higher levels of fee transfer suspension are evident in Russia, Eastern and northern Europe, Central andAfrica and Egypt.

5.4.2 Mobile Transaction

In Figure 5 shows circulars relating to mobile transactions are limited to Central Africa and Central America. No countreis from high income and only Jordon and Columbia that circulate a policy for Encouraging the use Raise Mobile Transaction. Most of Raising Mobile policy are coming from lower and lower middle income countries such as Bangladesh, Gaza, Kenya, Mozambique, Nigeria, Nepal, Rwanda, Ghana and Ethiopia.

Figure 5: Govement Mobile Transcation Ciculars worldwide during COVID19

5.4.3 Ease Limit

We can also observe the only Saudi Arabia (from high income category) that circulate a policy relates to easing the limits on transactions for corporate and agents, and Russia (from Upper middle-income category) while the remaining circulars are announced by African countries (Kenya, Cameron, Zimbabwe, and Zambia).

5.4.4 Biometric verification

Untabulated resutls also show 3 circualrs announced relating to biometric verification are limited to Pakistan, Philipine and Gorgeia.

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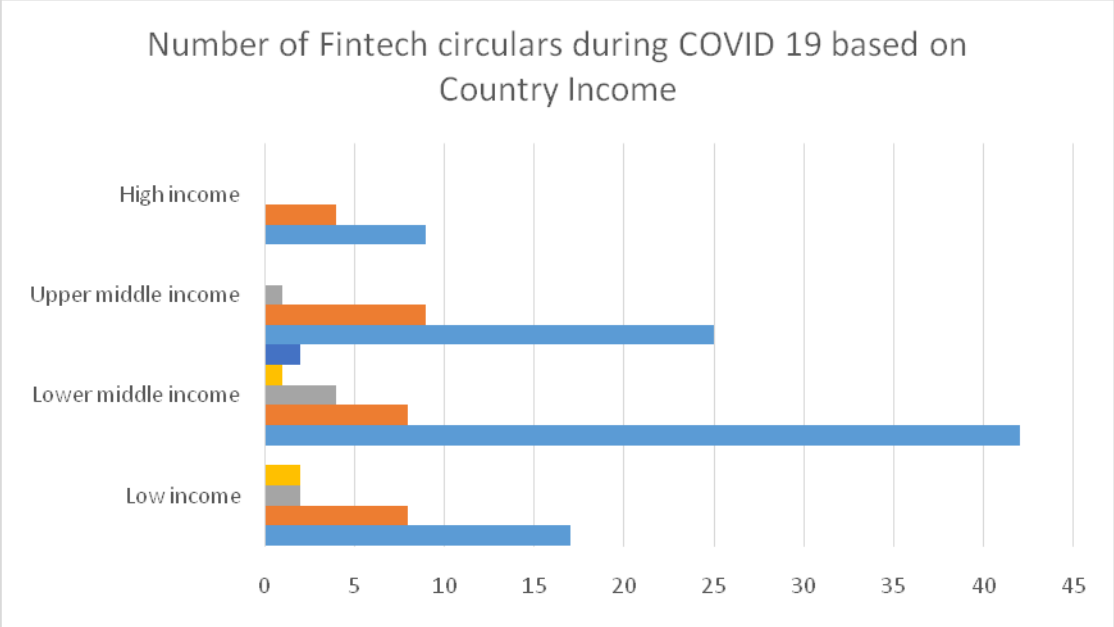
Figure 6: Number of Fintech circulars during COVID 19 based on Country Income



In Figure 6, we observe more Fintech circulars for lower income countries relative to higher income countries during the period from February 2020 to 31 Jun 2020. Overall, we find that the Covid-19 pandemic during 2020 had an important impact on lower income countries adoption of Fintech. We find that the pandemic had a favourable impact on Fintech adoption in Central African countries, Russia, South-East Asia and Eastern Europe in particular. Higher population levels in these lower income countries appear to have driven the adoption of Fintech because these countries tend to have weaker health care systems and the demographics pertaining to age and population density have pushed dissidents to use Fintech.

5.4.5 Global personal remittances relative to population dynamics and technology exports

In Figures 7 to 11, we map personal remittances received (% of GDP), population dynamics and technology exports. We observe that countries with higher Fintech, as measured by greater levels of personal remittances have younger populations and are not exporters of high technology. This demonstrates that countries with higher level of Fintech during the Covid-19 pandemic have younger populations and are reliant on these forms of technology to sustain their welfare.

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Figure 7: Personal remittances, received (% of GDP)- World Bank

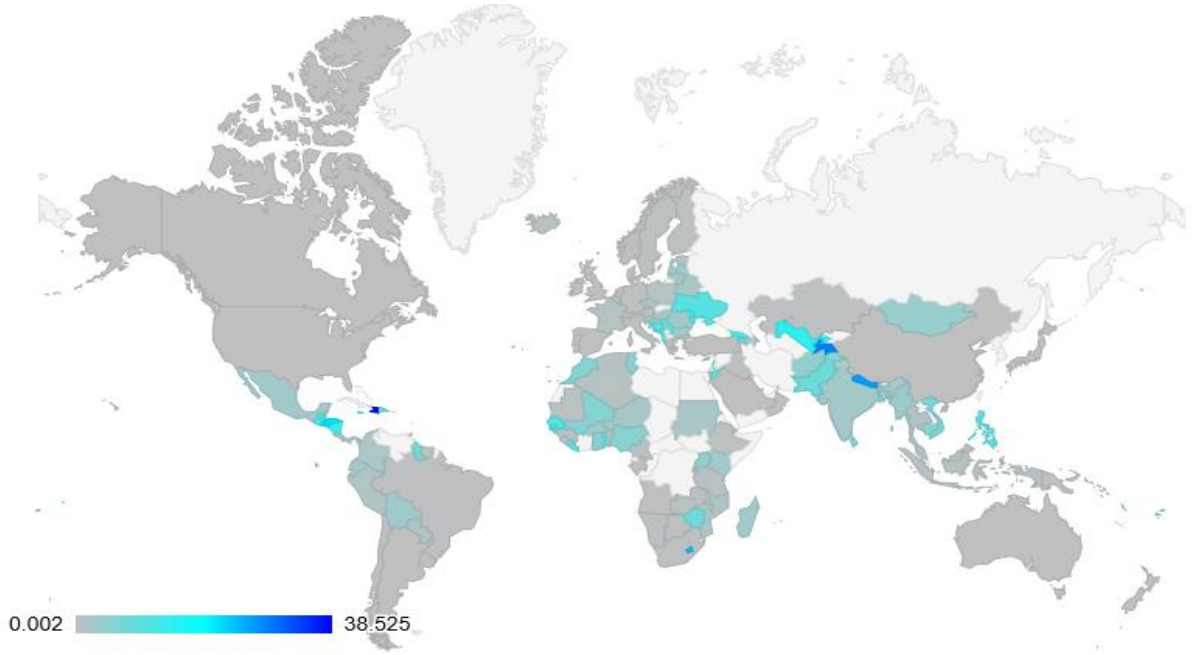

Figure 8: Female Population age 60-64 World Bank Jan 2020

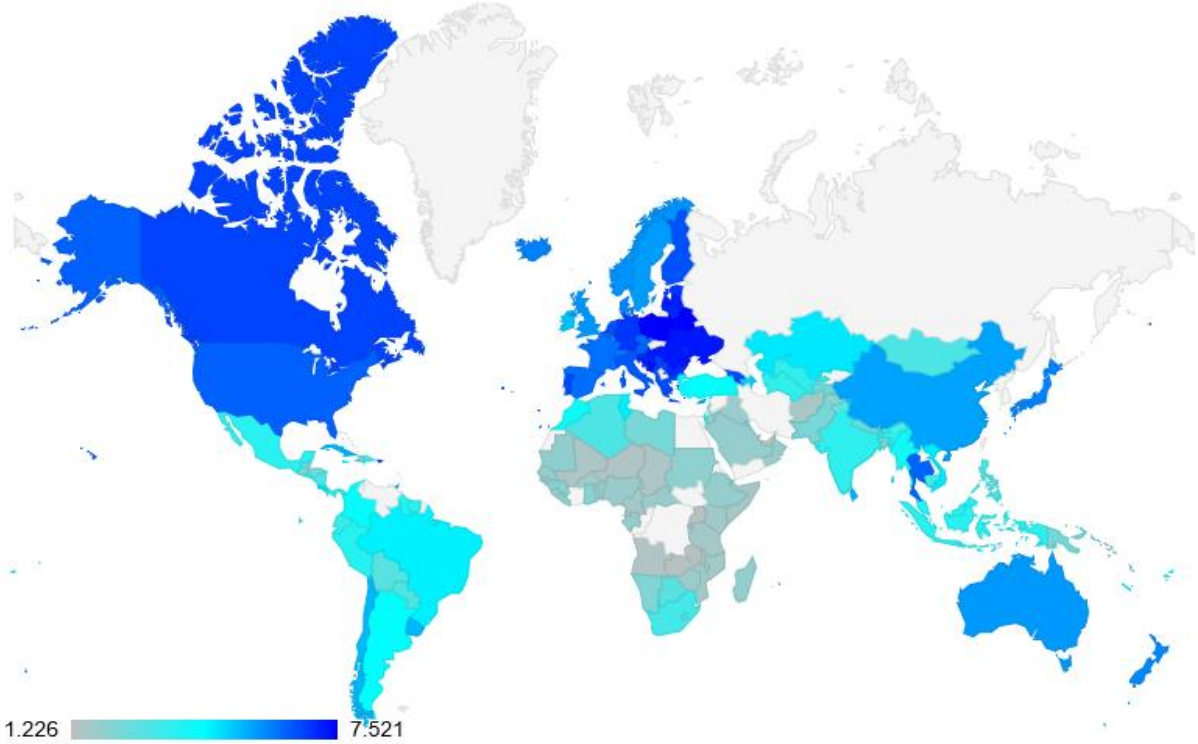

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Figure 9:Male Population age 60-64 World Bank Jan 2020

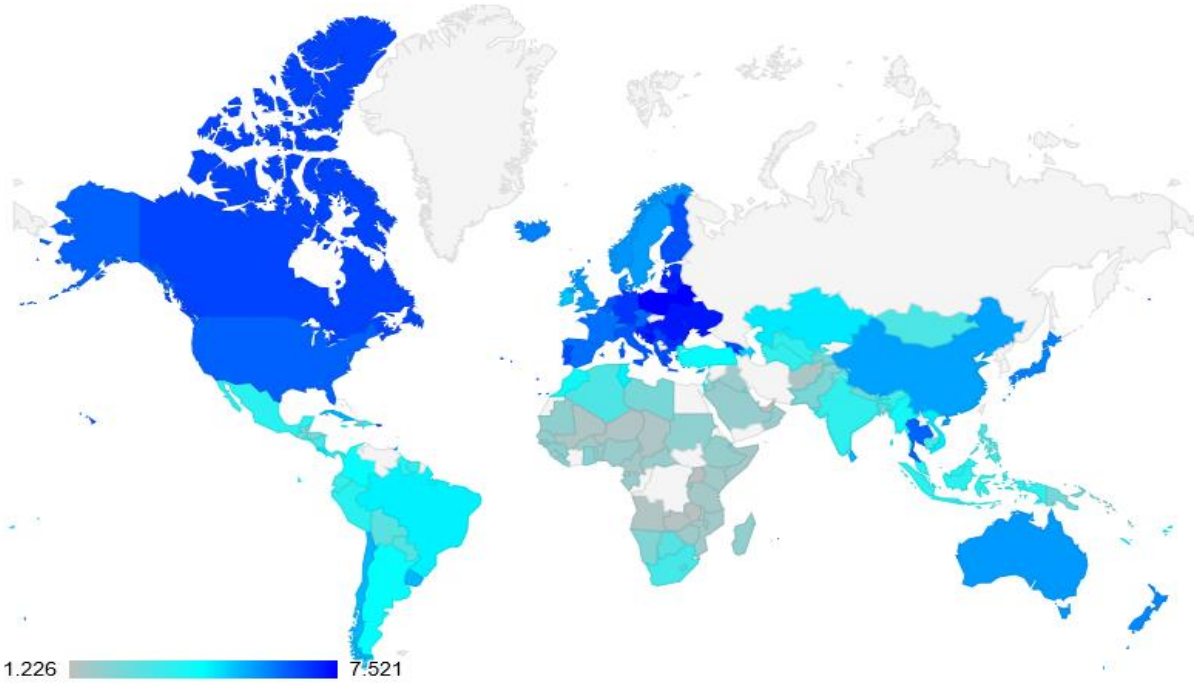

Figure 10: Age dependency ratio - young (% of working-age population) World Bank Jan 2020

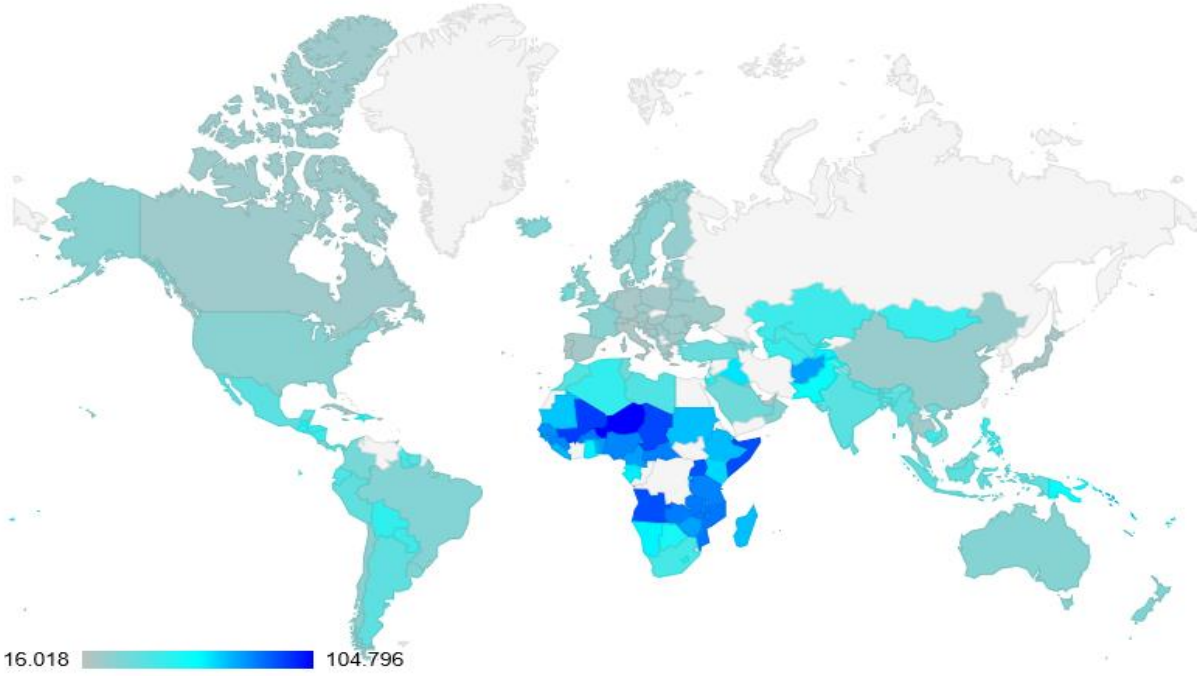

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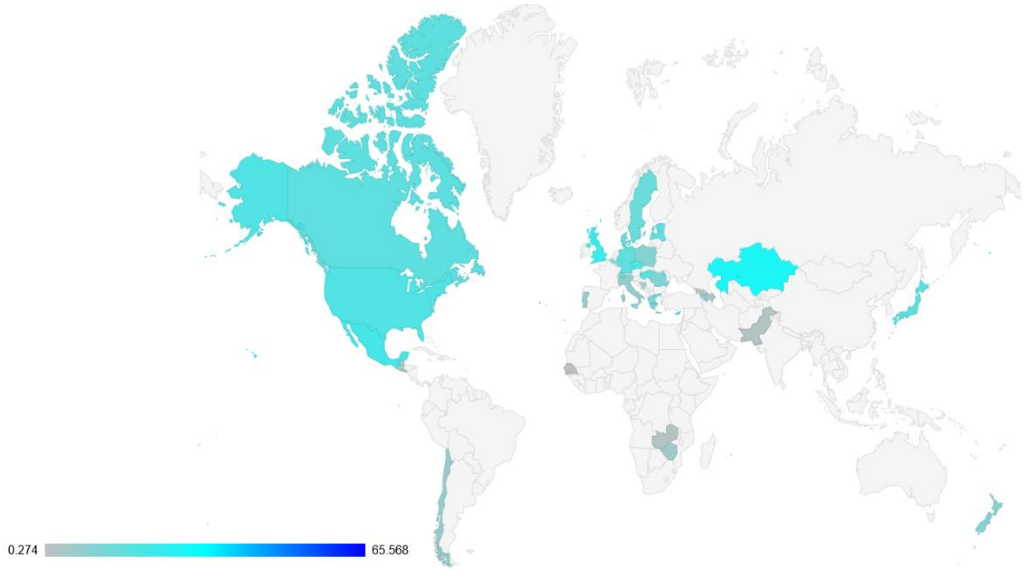
Figure 11: High-technology exports (% of manufactured exports)



6. Conclusions:

We examine whether the Covid-19 pandemic affects financial technology (Fintech) use decisions. Using evidence obtained during 2020, we find that there is an inverse relation between country level uptake of Fintech and intensity of COVID-19 infections and fatalities. We observe an increase in use of digital payments, e-wallets, and a reduction in use of cash, a suspension of fees relating to monetary transfers particularly in countries that have more rigorous controls relating to covid-19 during the first six months of 2020. Fintech increases financial resilience in countries which enables people to withstand short-term and temporary loss of income. Lockdowns and stoppage of economic activities induced short-term hardships on the population. Consequently, populations with higher financial resilience were better equipped and able to bear the unexpected and sudden economic hardships and abided by those. Complying with strict lockdown measures limited the community spread of COVID. Hence we hypothesize that countries with higher adoption of Fintech in their lowest socio-economic strata will have lower cases of COVID infection cases and deaths.

We contribute to the literature in a number of important ways. To the best of our knowledge, this paper is the first that examines the use of Fintech and Covid-19 infection rates. Second, we contribute to the literature by investigating whether societies with greater penetration into information age fared better in dealing with the spread of the pandemic. We use adoption of Fin-Tech as a proxy to ascertain individual's ease of access to real-time information, and the society's ability to harness the power digital technology in instituting data-based sound policies. We use measure of how the pandemic spread and how quickly was it isolated and controlled as a measure of the effectiveness of government response to the crisis. Third, the current literature on the benefits of fin-tech adoption has been limited to financial benefits in terms of reduction of fees and penalties paid to banks. Our study is unique in that it measures indirect benefits on how

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the infrastructure supporting fin-tech and the consequent change of individual behaviour may help societies and individuals abate the spread of the pandemic in those societies. Overall, we find that the Covid-19 pandemic during 2020 had an important impact on lower income countries adoption of Fintech. We find that the pandemic had a favourable impact on Fintech adoption in Central African countries, Russia, South-East Asia and Eastern Europe in particular. Higher population levels in these lower income countries appear to have driven the adoption of Fintech because these countries tend to have weaker health care systems and the demographics pertaining to age and population density have pushed dissidents to use Fintech.

Appendix A: Variables Definition

Digital payments	=	Dummy variable equal 1 if the policy Encouraging the use of Digital payments, and 0 otherwise.
Cashless	=	Dummy variable equal 1 if the policy provide encourage reduction in physical cash usage, and 0 otherwise.
e-Wallets	=	Dummy variable equal 1 if the policy Encouraging the use of e-wallets, and 0 otherwise.
Suspension fees for money transfers	=	Dummy variable equal 1 if the policy suspend the payment of fees for money transfers/ waived fees for payments related to platforms and mobile, and 0 otherwise.
Mobile Transaction	=	Dummy variable equal 1 if the policy Encouraging the use Raise Mobile Transaction, and 0 otherwise.
Easing Limits	=	Dummy variable equal 1 if the policy Easing the Limits on transactions for corporate and agents, and 0 otherwise.
Biometric verification	=	Dummy variable equal 1 if the policy require more Biometric verification/ customer authentication, and 0 otherwise.

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