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G20 Digest

EDITORIAL

ARTICLES

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IMPORTANT NEWS

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Indian G20 Presidency: High Hopes in Turbulent Times

India formally assumed G20 presidency at the G20 Leaders' Summit in Bali, Indonesia on 16 November 2022. While the official business of Indian presidency effectively started from 1 December 2022, it was loud and clear from the Indian side in advance that the presidency values collective growth and prosperity for the entire world, and would be inclusive, ambitious, decisive and action-oriented. While accepting the G20 baton from the President of the Republic of Indonesia, Prime Minister Modi emphasized on the theme of Indian Presidency i.e. "Vasudhaiva Kutumbakam" or "One Earth, One Family, One Future". He further alluded to finding solutions to existential challenges facing the world through the sense of trusteeship. Further, Indian Presidency attached significant importance to the critical areas of development with an aim to strengthen the G20 Development Agenda. As 'Mother of Democracy' India believes that the benefits of development should reach all the human beings equitably. Moreover, women-led development, greater participation of MSMEs, and promoting entrepreneurship through start-ups are some of those thrust areas which would govern the deliberations and commitments of India during the year-long presidency in 2023.

While the Indian presidency shines with a rich and inclusive agenda at hand leaving much to the happenings in subsequent months, this issue of 'G20 Digest' covers three important areas that are likely to get substantive attention in the deliberations of various Working Groups and Engagement Groups. The paper on debt is a burning issue necessitating coordinated action by the G20 countries. Enhanced implementation of Common Framework and mobilizing external financing could help support the debt-affected economies particularly in Africa in resolving the mounting debt service burden.

As we know geo-political tensions in the past few months have caused serious disruptions in supply chains, the G20 deliberations can take cognizance of this issue in the trade and investment vertical. Investment in infrastructure that facilitates supply chain linkages would address inefficiency and ensure resilience. The paper on infrastructure and supply chain resilience goes into these details. Fintech platforms and solutions are increasingly gaining popularity among firms and customers worldwide for provision and access to various financial services. While speed, ease and paperless format are major attract points of fintech, it is proving to be a significant technological breakthrough having enormous developmental spinoffs. The paper on fintech highlights some of those aspects in detail.

We hope our readers will find this issue of G20 Digest informative and useful.

Enjoy reading it.

Priyadarshi Dash
Managing Editor

Research Article

G20 Solutions for Mounting Debt Crisis: An African Perspective

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Yesuf Awel[a], Stephen Paduano[b], Dobrina Poirier[c], Sweta Saxena[d] and Sophia Schneidewind[e]

Abstract: India's G20 presidency offers a historic moment of Global South leadership on a wide range of global economic issues. It also comes amidst a series of economic shocks and pressures that are particularly acute for African economies. This research note discusses the opportunity created by India's G20 presidency and the African challenges to which the G20 should attend. It then advances proposals for the G20 to consider regarding: strengthening the global debt architecture and expediting Common Framework restructurings, strengthening the SDR system and allowing for SDR rechanneling to multilateral development banks, providing fair financing and support for low-income countries' energy needs and energy transition, and tending to longer-term priorities such as domestic resource mobilization and digitalization.

Introduction

As India assumed the presidency of the G20 in December 2022, it marked a historic moment for developing countries of the Global South. For the first time, the Troika will be comprised of three emerging market economies: Indonesia, India and Brazil. This provides a unique opportunity to look at development and formulate outcomes and deliverables from the perspective of developing countries. This is a huge victory for the Global South, as the agenda has generally been set by the developed countries at the G20.[1] Additionally, in this role, India has stated that it seeks to find pragmatic global solutions in the spirit of "*Vasudhaiva Kutumbakam*" or "*The World is One Family*."

This concept suggests that it is high time to address the needs of neglected members of the global "family." For

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The views expressed are those of the authors and do not necessarily carry the endorsement of the United Nations.

a region that houses more than 80 per cent of the global poor, has immense investment needs, and is a victim of climate change when it has not contributed to the problem, Africa requires massive financing to fulfil the Goals of the 2030 Agenda for Sustainable Development as well as the 2063 Agenda: The Africa We Want. With fiscal space squeezed due to concomitant shocks—the pandemic, the Ukraine war, global monetary tightening—as well as declines in official development assistance and private sector financing, it is important to lay out how the G20 can help African nations recover.

This research note first evaluates recent global events, their impact on Africa, and how financing needs are rising just as fiscal space is shrinking. The issue of unsustainable public and publicly guaranteed debt is then analyzed, and attention is given to how the changing creditor landscape requires a rethinking of the global financial architecture by the G20.

The Quadruple Crisis and Its Impact on African Economies

Since the beginning of the new decade, Africa and the world have been hit by a series of shocks including the Covid-19 pandemic, the cost-of-living crisis fueled by the war in Ukraine and tightening global financial conditions as major central banks raise interest rates to fight inflation. When adding the escalating climate crisis, these developments constitute a quadruple crisis threatening to lead to a lost decade for Africa.

On the eve of the pandemic in 2019, 35 per cent of the African population was living in extreme poverty, down from 55 per cent in 2000. This was possible due to the high economic growth over that period. However, the pandemic has threatened to reverse more than two decades of development on the continent and push some 55 million people into extreme poverty.[2] With over 80 per cent of African employment in the informal sector providing no social security or healthcare coverage,[3] a distressing percentage of households on the continent has been vulnerable to the loss of lives and livelihoods due to Covid-related disruptions.

As the region was recovering slowly from the pandemic, war broke out in Ukraine, which increased the price of food, fuel and fertilizers. The hike in prices is affecting the 667 million people (39 per cent of the population) that are still living in poverty as they spend about 40 to 60 per cent of their incomes on food. Moreover, 310 million Africans are experiencing some form of food insecurity and 6 million Africans are facing extreme hunger in 2022.[4] Climate-related extreme events further exacerbate this: it is projected that by 2030 up to 118 million Africans facing extreme poverty will also be exposed to droughts, floods and extreme heat.[5] The cost of these crises is high, as they have pushed close to 80 million people into extreme poverty. Relief for the vulnerable is far from sight due to the deteriorating macroeconomic situation.

Against this backdrop, governments across the continent face pressure to increase spending. However, they are constrained given rising interest rates, the reversal of global capital flows, and the loss of market access. In addition, GDP growth on the continent is projected to decline to 3.5 per cent in 2022 from 4.7 per cent in 2021, leading to a decline in tax revenues that further constrains fiscal space.[6] In light of these monetary and fiscal pressures, government debt has

risen from 61 per cent in 2019 to 67 per cent in 2022, while the fiscal deficit has risen from 2.7 to 4 per cent of GDP over the same period[7]. All of these difficulties will be compounded so long as food and fuel prices continue to rise and continue to push up global inflation, which creates further financing squeezes and further tax revenue declines.

Financing Needs

Africa's financing needs for growth, poverty reduction, climate adaptation, infrastructural development and more were enormous and unmet prior to the pandemic; the quadruple crisis has raised them further. Drawing on the estimates for 10 sectors related to the SDGs by Kharas and McArthur (2019)[8] and recent estimates from the Climate Policy Initiative (2022), Africa needs a minimum of $850 billion for the SDGs annually. Further, for Africa to put "the people and planet" first, the tasks are vast. Achieving climate change targets requires an annual investment of $300 billion in mitigation and adaptation in order to implement its nationally determined contributions as per the Paris Agreement on climate change[9].

Financing needs increased following the outbreak of the Covid-19 pandemic: Africa now needs an additional $154 billion annually to achieve the SDGs, and an additional $285 billion for the next five years to ensure an adequate response to COVID-19.[10] Rising financing needs significantly constrain the continent's ability to meet its development targets in critical areas such as infrastructure, health, education and climate. Overall, the annual financing needs for SDGs and achieving the climate target in Africa is estimated at $1.3 trillion. Based on the historical averages of savings, foreign direct investment and official development assistance flows for the last two decades in Africa, we estimate the annual financing gap[11] for Africa to be nearly $500 billion. These figures are only reflective of the magnitude of current financing needs and gaps; however, more research is required to yield precise country-, region, and sector-specific figures for the African continent.

Mounting Debt Challenges and Limited Access to Finance

Mounting Debt Challenges

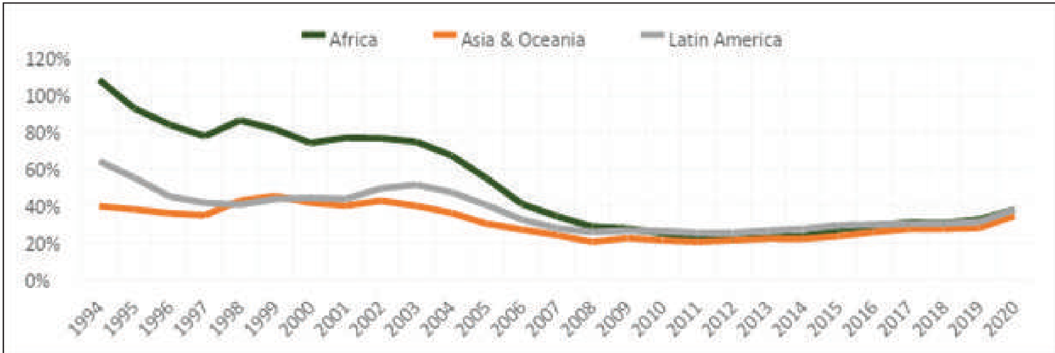
The average external debt-to-GNI ratio declined during the 1990s and 2000s across today's low-and middle-income countries (Figure 1). Important factors behind this development were debt relief through the Heavily Indebted and Poor Countries (HIPC) program and Multilateral Debt Reduction Initiative (MDRI) as well as economic growth. The decline was particularly pronounced in Africa, the region home to nearly all HIPC participating countries, where the average external debt-to-GNI ratio dropped from 109 per cent in 1994 to 22 per cent in 2011. After reaching the lows in the early 2010s, debt-to-GNI ratios started to increase, especially after the COVID-19 pandemic. In 2020, the average external debt-to-GNI ratio stood at 38 per cent in Africa, 35 per cent in Asia & Oceania, and 38 per cent in Latin America. Overall, low- and middle-income countries' average external debt-to-GNI ratio increased rapidly from 22 per cent in 2011 to 37 per cent in 2020.

These recent increases in debt levels are reflected in the number of countries that find themselves in or at risk of debt distress based on the LIC Debt Sustainability Analysis conducted by

the IMF and the World Bank. As of November 2022, eight countries in Africa and one in Latin America are in debt distress. 14 countries in Africa, 11 in Asia & Oceania and 3 in Latin America are at high risk of debt distress. Debt relief and restructuring are urgently needed to prevent another large-scale debt crisis.

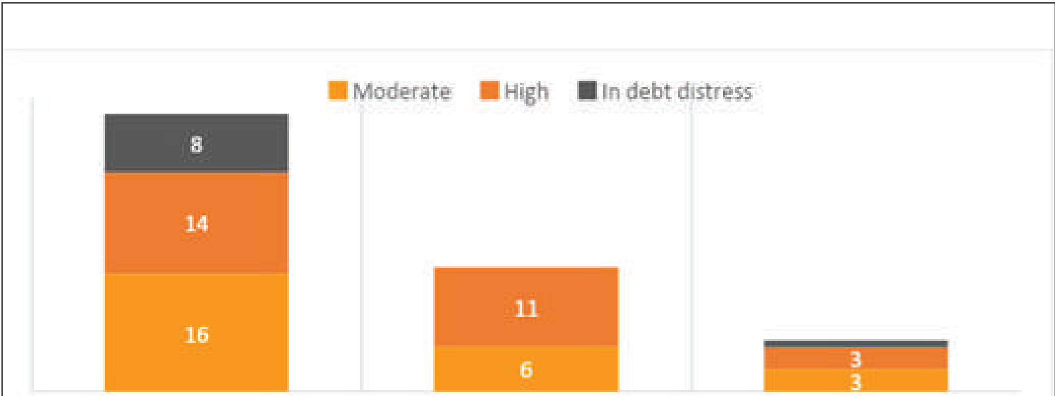
However, one of the key challenges in debt management currently is the change in countries' creditor profiles since the 1990s, which has not been accompanied by the necessary reform of the global architecture for sovereign debt restructurings. While the share of debt owed to multilateral organizations remained constant over time (24 per cent in 1994 and 2020), there have been three important developments (Figure 3). *Firstly*, the importance of the Paris Club, whose membership consists of 22 predominantly "Western" countries,

Figure 1: Low- and Middle-income Countries' Average Public and Publicly Guaranteed (PPG) Eternal Debt-to-GNI Ratio by World Region



Source: World Bank International Debt Statistics, November 2022.

Figure 2: Number of Countries at Risk of Debt Distress by Risk Category and Region



Source: IMF & World Bank LIC Debt Sustainability Analysis, Nov 2022.

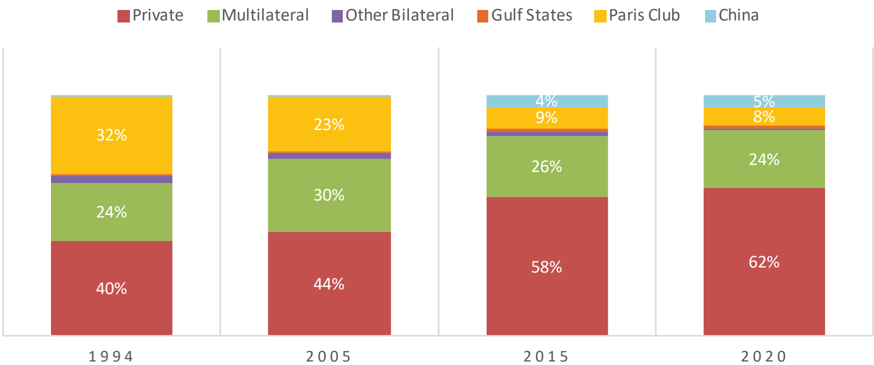
Note: The LIC Debt Sustainability Analysis is only conducted for PRGT-Eligible countries. Market-Access Countries are not included in the analysis.

has decreased substantially over time. *Secondly*, new bilateral creditors, such as China, have emerged. *Thirdly*, a much larger share of debt is owed to the private sector.

In the case of Africa, these same trends are even more pronounced (Figure 4). While 44 per cent of African countries' debt was owed to the Paris club in 1994, this share had dropped to only 8 per cent by 2020. China's share increased to 12 per cent in 2020, and the one of the private sector to 41 per cent.

Such profound changes in the creditors' profiles create a serious coordination challenge: a country facing a debt crisis can no longer act through the singular forum of the Paris Club to seek relief and restructure its debt. Now there must be significant coordination between

Figure 3: Low- and Middle-income Countries' Public and Publicly Guaranteed (PPG) External Debt by Creditor

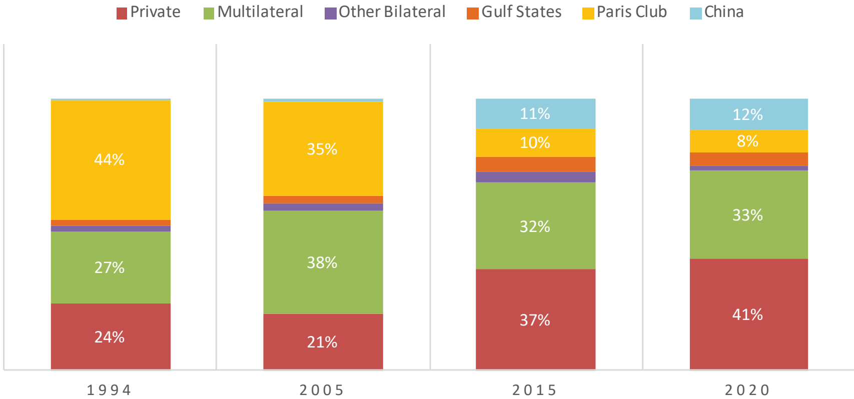


Source: World Bank International Debt Statistics, November 2022.

Note: Gulf States include Saudi Arabia, Kuwait, Bahrain, Qatar and United Arab Emirates.

Note: Low- and middle-income countries in Africa, Asia & Oceania, and Latin America are included

Figure 4: African Countries' PPG External Debt by Creditor



Source: World Bank International Debt Statistics, November 2022.
Note: Gulf States include Saudi Arabia, Kuwait, Bahrain, Qatar and United Arab Emirates.

non-Paris Club creditors and the Paris Club.

Limited Access to Finance

After more than a decade of a low interest rate environment in developed economies, financial conditions have been rapidly changing with interest rate hikes in the United States, the United Kingdom and the euro area adversely affecting access to finance for the developing world. With global recession in sight, the outlook is less favorable for African economies which are dependent on exports from outside the continent. Moreover, the recession could mean lower FDI and remittance flows into Africa, further challenging the financing conditions at home.

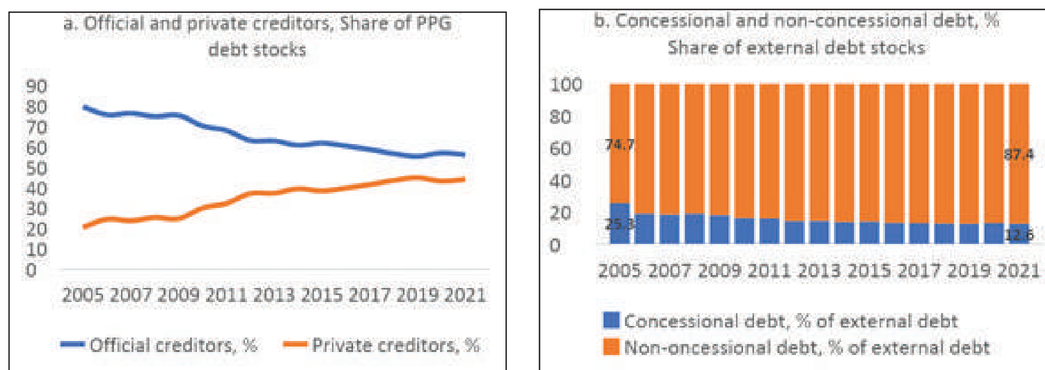
Diminishing Concessional Financing and Market Access

There is no denying that the developed world has not fulfilled its Addis Ababa Action Agenda commitment on aid. At the time, countries recommitted to achieve the target of 0.7 per cent of gross national income (GNI) for official development assistance, and 0.15 to 0.20 per cent for least developed countries. However, so far only a few countries (e.g., Denmark, Germany, Luxembourg, Norway, Sweden and Turkiye) have fulfilled their commitment.

Additionally, the share of debt from official creditors has been on a decline (Figure 5a), signaling that concessional financing is becoming less available (Figure 5b.). However, this trend is not surprising since African countries have been steadily gaining market access which has allowed the choice to finance their development by borrowing from the global capital markets. This is an aspiration which every African nation strives to achieve. Between 2007 and 2020, 21 African economies have accessed the markets, many of which as first-time borrowers, with the stock of outstanding Eurobonds, amounting to $140 billion as of 2021 (IMF 2021).[12] The downside of this trend has been rising debt service burdens and debt sustainability difficulties, given that the average lending rates of official creditors for the period 2015-2019 was 1.66 per cent compared to private creditors' 3.93 per cent average.

As global shocks continue to worsen the economic situation across the globe, African economies fortunate to have market access find themselves in a precarious situation. It is reflected in credit rating downgrades and double-digit interest rates which in most cases are

Figure 5: Africa's External Debt by Creditors



Source: World Bank International Debt Statistics database, November 2022

not predicated on market fundamentals and public policies but rather "perception premiums." At a time of dwindling fiscal resources, this puts additional strain on borrowing to recover. The spillover effects of these prohibitive market borrowing conditions have been felt across the board, with countries finding themselves shut out of the markets at a time when concessional financing is limited to low-income countries and ODI is at an astonishing decline.

Lack of Fiscal Space

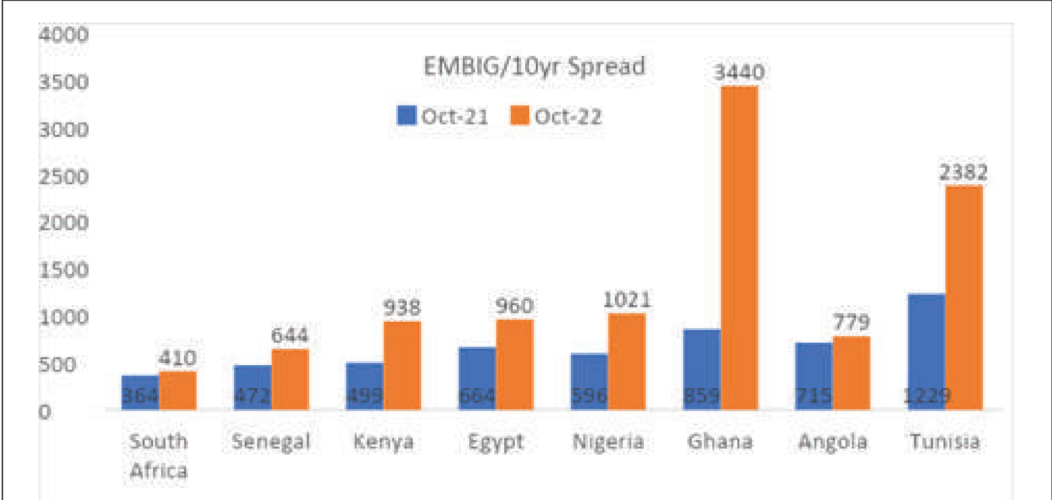
The recent crises will leave long-term scars on multiple economic, social and environmental factors of African states. One of the more pronounced and protracted difficulties will come from the vicious cycle of lower economic activity reducing tax revenues, which reduces public spending, which further reduces economic activity, which further reduces tax revenues, and so on – creating a steep and entrenched impediment to Africa's economic recovery. This vicious cycle threatens to be accelerated and exacerbated as inflation, monetary tightening, and exchange-rate depreciation continue to constrain the ability of African economies to implement sustainable countercyclical monetary and fiscal policies.

In the context of high indebtedness, and with the risks of refinancing far from over, the way out of the crisis is fraught with pitfalls unless a renewed support from the international community is available.

Solutions at the G20 level

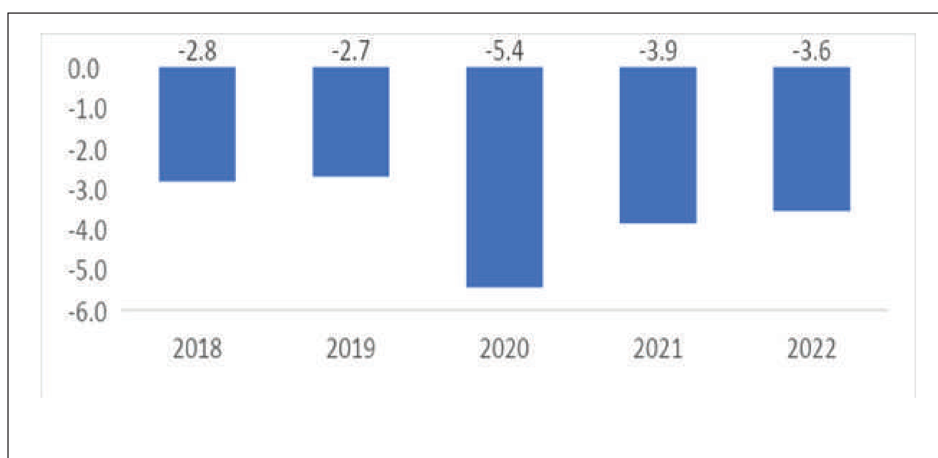
As mentioned, the fiscal needs to fight the pandemic led to a rise in debt levels that create the specter of an emerging-market debt crisis on the scale of the 1980s and 1990s. Thus far, two important debt-related initiatives have been rolled out: the Debt Service Suspension Initiative (DSSI) and the G20 Common Framework. However, they have not proven sufficient to help developing countries efficiently restructure unsustainable debts or tackle their fiscal space problem. We offer a few suggestions that can help the developing

Figure 6 : Yield to Maturity on Eurobonds with ~10 Years to Maturity



Source: Bloomberg, November 2022

Figure 7: Africa's Fiscal Balance (% of GDP), 2018-2022



Source: IMF WEO, October 2022

world and Africa address these debt issues in a way that will help them find financing and recover from the recent and ongoing shocks.

Enhance G20 Common Framework and Re-envision its Mandate to Ensure Against Future Shocks

The mechanism deployed by the G20 to deal with debt restructuring issues – the G20 Common Framework beyond the DSSI – has unfortunately struggled to deliver a timely and orderly debt resolution process. Four countries have applied for Common Framework Restructurings— Zambia, Chad, Ethiopia, and Ghana —and all have faced delays and uncertainties (UNECA, 2023).[13] Nearly two years since its launch, the Common Framework has only announced its first deal for the restructuring of Chad's debt – and this restructuring is notably not quite a "Common Framework" restructuring as it revolved around a resolution with one creditor, Glencore, rather than engaging all of Chad's bilateral creditors.[14]

The issues underpinning the scheme's inefficiencies are many. *First*, the current debt restructuring architecture does not reflect the rise in complexity of creditors. Both the composition of the creditor base and that of debt instruments in developing countries need to be taken into consideration in the debt restructuring process. *Second*, participation in the G20 Common Framework is on a voluntary basis and the G20 does not have the capacity to enforce the participation of private sector creditors, which are expected but not legally bound to provide debt relief on comparable terms to those granted by bilateral creditors. *Third*, there are significant coordination challenges between Paris club and non-Paris club creditors, which cause delays in the formation of creditor committees. *Fourth*, a lack of positive incentives for debtors to participate in restructuring (e.g., a debt service standstill) as well as certain stigmas associated with participation (e.g., risk of downgrades, loss of market access, etc.) deter countries from applying. *Lastly*, debt transparency issues further delay the restructuring process.

The G20 must Introduce Reforms that Strengthen and Expedite Common Framework Restructurings.

At the onset of any restructuring, the G20 should establish "Expanded Creditor Committees" to incorporate private sector creditors, which will help to smooth coordination challenges. The G20 should also suspend debt service for all countries applying for Common Framework restructurings, which will incentivize debtor countries to undertake restructurings earlier, provide those debtor countries the relief they need during these difficult times, and incentivize creditors to act more expeditiously during restructurings in order to recommence the collection of interest payments. The Common Framework should also be extended to a wider pool of countries, including heavily indebted middle-income countries.

Furthermore, the G20 should Engage in Close coordination with multilateral institutions, such as the IMF and the World Bank in creating pathways for overcoming the gaps between traditional and non-traditional creditors. For example, the IMF is best placed to serve as the technical secretariat in coordinating Common Framework restructurings and address the divisions that currently exist between different creditors, namely, Paris and non-Paris Club creditors. Reflecting on the defining moments of the Fund's history can help the institution rise to the challenges of the 21st century. Perhaps the most catalytic moment, described as the "coming of age" or "eclipsing" of the institution, came after the debt crisis of the 1980s. The Fund played a central role in devising and implementing a debt reduction strategy that involved coordination between a diverse set of creditors, most notably private banks and indebted low and middle-income economies. The efforts placed the Fund at the center of the international monetary system and earned its title as the manager of international financial crises. As history has shown, the IMF can and should play a more prevalent role in supporting current debt restructurings and strengthening the coordination of the G20 Common Framework. In its role as the technical secretariat of future Common Framework restructurings, the IMF would also be able to help develop a "multilateral legal framework" that supports the Common Framework – namely revolving around enhanced collective action clauses that allow for more rapid restructurings, enhanced force-majeure clauses that can suspend or reduce debt obligations in the event of natural disasters, and anti-vulture fund measures that can eliminate costly and vexatious litigation against low- and middle-income countries (UNECA 2023).

As the quadruple crisis of the last three years have proven, low and middle-income countries can suffer catastrophic consequences from a single exogenous event that is beyond their control. In that sense, establishing a multilateral legal framework remains critical for preventing liquidity crunches from metastasizing into insolvency issues. For this reason, developing and adopting clauses into bond and loan contracts that ensure against major natural disasters and pandemics can provide countries with critical liquidity at a time when they need it most. Recent progress on these efforts have come from Barbados, which has piloted the insertion of a 'natural disaster clause' in a sovereign bond issue that would suspend debt service payments in the event of earthquakes, tropical cyclones, and earthquakes. Future work can be expanded in the direction of state-contingent debt innovations (SCDIs) that account not only for climactic and

health events (e.g., pandemics), but also for fluctuations in GDP, exchange rates, or the prices of key commodities — thereby making debt contracts smarter, and attracting creditors with equity-like returns in strong years while insulating debtors from financing squeezes in difficult years through reductions or suspensions in debt service burdens.

Mobilize External Financing for Developing Countries to Meet Short-term Liquidity and Long-term Development Needs, including the SDGs by Accelerating SDR Rechanneling and Replenishing Concessional Lending Facilities

The current state of the world calls for urgent action in mobilizing financing to address both short-term liquidity needs and long-term development goals. Especially when concessional financing is less accessible, access to markets is prohibitive for those who are fortunate to have it. This is exacerbated by the fact that official development assistance is in sharp decline for both technical and political reasons – reductions in GNI have led to reduced total ODA spending at the same time that certain governments (e.g., the United Kingdom) have also elected to cut their aid budgets from 0.7 per cent to 0.5 per cent of GNI. In this new reality of chronic insecurity and shrinking policy space to respond, developing countries need urgent assistance from the IFIs and G20 countries.[15]

Accelerate SDR on-lending and replenish concessional lending facilities. The G20 pledged to on-lend $100 billion SDRs equivalent of developed country SDRs in May 2021. The IMF is on track to meet its $44 billion target for funding the Resilience & Sustainability Trust (RST), however subsidies resources are lacking for the $19 billion funding strategy for the Poverty Reduction & Growth Trust (PRGT). The Fund is trying to mobilize SDR 12.5 billion for the PRGT loan account and SDR 2.8 billion for the subsidy and reserve accounts. Without these funds the PRGT is in danger in the immediate future. Loan target resources are three-fourth met, while only about a third of the Subsidy Account has been raised. This is substantially lower than the anticipated amounts. The G20 should call on all countries to support the on-lending effort by firming up their pledges to the Trust. Furthermore, the G20 needs to call on developed countries to step-up their commitments in subsidy resources for the PRGT, which are key to ensuring the concessionally of lending.

Support MDB Rechanneling. Multilateral development banks (MDBs) and advanced economies should move expeditiously to allow for the rechanneling of SDRs to prescribed holder MDBs. The IMF's rechanneling trusts (the RST and PRGT) can only absorb $63 billion in SDRs, which is insufficient to meet the G20's commitment to rechannel $100 billion in SDRs. MDBs will be able to bridge this $37 billion gap in the near-term while also creating a robust SDR rechanneling architecture in the long-term. Two proposals have been made for this effort: the African Development Bank and Inter-American Development Bank's "hybrid capital proposal" and the "SDR bond" (Setser and Paduano 2023). The hybrid capital proposal entails direct SDR contributions to the AfDB and IDB, which are scored as equity and can be leveraged 3-4 times, and are encashed with a "liquidity support agreement." This may work for some IMF members—such as China, Japan, South Korea, and Saudi Arabia—however it faces technical, legal, and political difficulties for other IMF members. These countries—the

United States, the Eurozone countries (chiefly France and Spain), the United Kingdom, and Canada—should therefore consider calling for the issuance of and pledging to purchase an SDR bond. Such a bond would be denominated in SDRs but settled in hard currency, allowing it to trade in the secondary market as a normal security—boosting its reserve asset status and making it easier for technically, legally, and politically constrained finance ministries and central banks to purchase. The G20 should call on multilateral development banks to adopt such SDR rechanneling mechanisms and on advanced economies to support them.[16]

Improve SDR utilization. At present, the total outstanding SDR market amounts to $935 billion. Given that allocations are delivered predominantly to advanced economy members, which generally neither need nor use their SDRs but nonetheless face various institutional difficulties in their efforts to on-lend or grant SDRs to other members and prescribed holders, the vast majority of SDRs are sitting idle on the balancing sheet of higher-income countries. This problem is reflected in the divergent SDR utilization rates of developed and developing economies—just 5.9 per cent for developed economies versus 42.9 per cent for developing economies and Africa at 52.4 per cent (ECA and ECLAC, 2022).[17] The technical and political difficulties encumbering SDR rechanneling should be addressed as an urgent matter by the IMF Board (Paduano 2022).[18] This may start with loosening the "reserve asset characteristic" requirement, which will facilitate SDR rechanneling towards critical but not-entirely-liquid investments. In the medium-term, the IMF should also improve the SDR interest rate system, which presently discourages SDR utilization by only introducing an interest rate cost once holdings dip below allocations, which is to say once SDRs have been used. This can be achieved by raising the allocation rate above the holding rate in order to discourage idle SDR accumulation; replacing the existing dual-rate system with a single negative SDR interest rate that only charges countries for holding SDRs; or by bringing the SDR interest rate to zero while simultaneously increasing the IMF's 'SDR levy' (its operational charge on SDR holdings).

Support a Transparent Market Mechanism for Carbon Pricing, Gas as a Transition Fuel, Ensure Enough Resources to Finance Climate Action

An urgent, massive and sustained investment push is needed to drive a strong and sustainable recovery out of current and recent crises, transform economic growth, and to deliver on shared development and climate goals. Key investment priorities and spending priorities must encompass the transformation of energy markets, which is vital for both energy security and climate, investing in biodiversity and sustainable agriculture to strengthen food security.

The G20 countries have a crucial responsibility from the standpoint of climate justice, given historical responsibilities and the need to act in their self-interest. Securing a fair energy transition is not only the responsibility of developing countries alone. In the case of the African continent for example, it is worthwhile noting that having contributed negligibly (less than 4 per cent) to global emissions, the region is the hardest hit by climate change. And while a low-carbon and climate-resilient growth is an avenue that provides an opportunity for leapfrogging in

advancing the climate and development agenda, it will remain an unattainable dream without massive international financial support.

In that respect, as we reflect on the recently concluded COP27, we ask the G20 to support a transparent market mechanism for carbon pricing. It is time for the developing world to capitalize on decarbonization: Africa is developing a Carbon Registry and will work with international organizations to help build more transparency in the Voluntary Carbon Market. As Africa looks to increase domestic resource mobilization, transparent market mechanisms to price carbon will be an important element of Africa's strategy.

Global Climate Goals must factor in the principles of common but differentiated responsibility and leaving no one behind. To advance Africa's climate goals, global policy makers must acknowledge that while the continent has made negligible contributions to global emissions, its energy needs are immense. In fulfilling its obligation to provide access to energy to its people and invest in green industrialization, African policy makers will need to create the space that is needed to transition their economies, in many cases by moving from inefficient and long-term costly energy sources such as biomass fuels and coal, to more efficient ones that may also include liquefied natural gas. In this regard, this paper calls on the G20 to recognize gas as an important transition fuel for African economies, one which is needed to help the continent transition away from less economically and environmentally efficient fossil fuels and build a green economy. As previously mentioned, most countries on the African continent are low emission, energy poor countries, with only about 31 per cent of the population having access to electricity. Even if electricity consumption is trebled solely through natural gas, it would add just 0.6 per cent to global emissions. At the same time, use of gas can enhance health-related goals, as over three million people die in a year from poor cooking stoves. Hence, the development benefits of using gas are tremendous, without contributing much to global emissions.

Support National Policies Focused on Domestic Resource Mobilization and Address Concerns on Digital Taxation

Even with the availability of concessional and non-concessional financing, the conditionalities and the unjustifiably high rates may hamper African countries from accessing finance as shown in the historical average change in debt contracted estimated at 2.8 per cent of GDP over the period 2015-2019, far from covering the financing gap of these economies. Hence, domestic resource mobilization efforts should also be strengthened and improved. The average tax to GDP for African economies hovers around 15 per cent. This is lower than the average for Asia and Pacific countries (21 per cent), Latin America and Caribbean countries (22.9 per cent) and almost more than half below the OECD average of 33.8 per cent.[19] G20 countries should support developing economies with improving their tax administration through technical assistance, sharing best practices in tax administration and digitalization of the public infrastructure.

The growing importance of the digital economy is apparent with global value of e-commerce sales estimated at $26.7 trillion, about 30 per cent of global GDP in 2019.[20] In Africa, e-commerce is expanding with nearly 30 per cent of Africa population engaged in online shopping in 2019.[21] The growing digital economy has attracted countries'

attention for widening their tax revenue sources through direct and indirect digital taxation. While taxing the digital economy could generate additional public revenue, it may also result in double taxation and tax administration challenges, especially for low-income economies. Though efforts are on-going by the international community to address the digital taxation challenges, countries have also introduced unilateral measures to tax revenues from digital services offered in their jurisdiction. By December 2022, 31 countries already enacted direct digital taxes while 100 countries enacted digital indirect taxes.[22] We call on G20 countries to accelerate the consensus building on digital taxation and its implementation. Consensus building on digital taxation is vital and it should address the concerns of countries and multinational companies. Otherwise, the unilateral measures taken by different countries threaten global trade, innovations and international tax scenarios.

Conclusion

As we celebrate the Troika consisting of emerging markets, this marks an appropriate occasion to ensure that the G20 works towards policies that help the developing world. Currently, developing countries are facing four major crises – namely, the pandemic, the cost-of-living crisis fueled by the war in Ukraine, tightening global financial conditions and climate change – none of which have been of Africa's own making. Even so, the devastating effects of these four external shocks have left many African countries among the most vulnerable in the world. It is time that developing countries recover and recover more equitably, inclusively, and sustainably. Such a recovery and a development path require financing. In this respect, the G20 can help in creating fiscal space through reforming the G20 Common Framework, redirecting SDRs towards developing countries, and supporting a transparent market mechanism for carbon financing. The G20 can also provide a voice to the developing world on tax issues – especially on taxing the digital economy.

Endnotes

1. Some of the focus areas during the next year include inclusive, equitable and sustainable growth, women's empowerment, digital public infrastructure, and tech-enabled development, climate financing, global food security and energy security, among others.
2. See Economic Report on Africa (2021).
3. See ILO (2022).
4. See FAO (2022).
5. See WMO (2021).
6. IMF WEO October 2022 database
7. IMF WEO October 2022 database
8. See Kharas, H. and McArthur. 2019.
9. See Climate Policy Initiative (2022).
10. See Georgieva. 2021.
11. The financing gap is computed as the estimated required financing less the available financing based on historical trends.
12. See IMF. 2021.
13. See UNECA. 2023.
14. Reuters. 2022.
15. See ECA.
16. Setser and Paduano. 2023.
17. See ECA and ECLAC. 2022.
18. See Paduano. 2022.
19. OECD/AUC/ATAF. 2021. Revenue Statistics in Africa 2021. OECD Publishing, Paris.
20. See UNCTAD. 2021.
21. See RetailX and Linnworks. 2021.
22. See KPMG. 2022.

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Research Article

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Planning and Investments in Infrastructure and Supply Chains: G20 Must Converge Trade and Investment with Infrastructure and Development Track

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Abstract: The Covid-19 pandemic has exposed the necessity for building resilience in global value chains (GVCs). For this investment in supply chain infrastructure is of critical importance. Existing ongoing projects underway in Asia are facing challenges in terms of planning and investment. This paper focuses on the role the G20 Working Group on Trade and Investment in developing infrastructure to boost resilience in trade and GVCs, and addressing further challenges in this context in the G20 economies, especially in Asia.

Infrastructure for Trade and GVC Resilience

Trade & investment and global value chains (GVC) resilience require investments in supply chain infrastructure. Infrastructure development is important for developing efficient and inclusive supply chains in Asia, especially developing Asia, to promote trade and investment. The COVID-19 pandemic has exposed urgency for GVC resilience everywhere, particularly in Asia. Any new threat to the connectivity of production networks or supply chains is now under the policy watch of Asia to ensure resilient supply chains that do not fall prey to disruptions. This includes accelerated planning and investments in alternate and/or new connectivity infrastructure plans. It also means that the connectivity plans are to be implemented not just as infrastructure plans but as the conduit of supply chains – for both goods and people – in Asia. Some connectivity plans can provide alternative supply chains during a crisis like the Covid-19 pandemic.

Several infrastructure projects are underway in Asia, but these face impediments in planning and investment.

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Countries will face an investment crunch in the times ahead as their financial resources have been dispensed in managing the twin health and economic crisis. Acceleration in the implementation of connectivity infrastructure is also being influenced by trade tensions between the United States and China. These trade disputes are prompting new supply chain connectivities, where new centres of production and consolidation of existing supply chains are emerging in Asia, Africa, and Europe. The emergence of the new supply chain linkages in Asia is an important addition to the existing connectivity plans in Asia. The rise of new sectors and modes of delivery will further impact the connectivity plans. The digital economy and demand for environmental products will favour a shift towards connectivity plans that will help Asia, especially developing Asia, to take advantage of these opportunities in high-income markets.

How can G20 influence the infrastructure development for trade and GVC resilience positively? What grounds are left uncovered in the Trade and Investment Working Group (TIWG) and the Infrastructure Working Group (IWG) and what are the options before the G20 economies, especially in Asia?

Planning for Infrastructure Projects that Facilitate the Supply Chains

Infrastructure projects face planning and investment bottlenecks, and these have been aggravated during and after the Covid-19 pandemic. Asia is one of the most dynamic and productive regions. Still, it is held back from realizing its full potential by huge constraints in crucial infrastructure caused by lack of investment. ADB has estimated that developing Asia will need to invest $26 trillion in infrastructure from 2016 to 2030, or $1.7 trillion per year. This would allow the region to maintain its growth momentum, eradicate poverty, and respond to climate change. Without climate change mitigation and adaptation costs, $22.6 trillion, or $1.5 trillion per year, will be needed (ADB, 2017).

ASEAN and East Asia are manufacturing hubs with close trade relations within the region and essential markets in the EU and the United States. Such trade integration has been achieved through supply chain efficiencies and market demands in which seamless connectivity plays an important role. In ASEAN and East Asia, supply chains rest on a stable trade and investment links. To the extent that there are risks, they are primarily at a micro-level.

Repeated natural disasters and the ongoing COVID-19 pandemic have reminded the world of the vulnerability of supply chains and risks to connectivity (Kimura, Umezaki, and Prakash, 2020). In this context, the potential of infrastructure plans such as the Trilateral Highway (TLH), the Asian Highway (AH), the Greater Mekong Sub-region (GMSR) lies in providing resilience to connectivity and supply chains once these are well connected to other road networks and the networks of different modes of transportation (e.g., railways, waterways, maritime, and air). The three plans are expected to deepen the existing supply chains in Asia and facilitate new routes for investments in and production and consumption of goods and services.

Projects like Asia Africa Growth Corridor (AAGC) envisage infrastructure planning and investment partly to provide new supply chain linkages in

Asia. More recently, Australia, Japan-India (AJI) Supply Chain Resilience Initiative, signed on 27 April 2021, was launched to minimize supply chain disruptions and diversify trade and investment, with a provision to expand the initiative to other regions (MOCI, 2021). The AJI is expected to create sustainable GVCs for the three countries and the region as a whole. The renewed emphasis on the Mekong Subregion in these new supply chain initiatives leads to new infrastructure drives in Asia with trade integration at the core and inclusive growth as the objective.

Asia risks taking its eyes off the ball in the continued planning and investment in infrastructure projects during and after the COVID-19 pandemic. A pandemic can set the prioritization better to develop the infrastructure. Governments can identify how to fill the gaps of infrastructure in several sectors like healthcare, telecommunications, and specifically in this matter—logistics.

In Asia, land, and sea infrastructure plans are to be implemented not just as infrastructure plans but as the conduit of supply chains – for both goods and people. The prioritization of infrastructure development should be given to the critical supply chain infrastructure. During the COVID-19 pandemic, it will advance the deliverable of necessary healthcare and basic needs amenities, such as vaccines, foods, and healthcare products.

Financing of Infrastructure Projects

Infrastructure development has not kept pace with demand. The McKinsey report of 2016 estimated the value of the world's existing infrastructure at $50 trillion, and the global market for new infrastructure up to 2030 could amount to more than $90 trillion. Current infrastructure spending of $2.5 trillion to $3 trillion a year is only half the amount needed to meet the estimated $6 trillion of average annual demand over the next

Table 1: Infrastructure Investment Needs by Sector (45 DMCs) 2016-2030 ($ Billion in 2015 prices)

Sector	Baseline Estimates			Climate-adjusted Estimates			Climate-related Investments (Annual)	
	Investment Needs	Annual Average	Share of Total (%)	Investment Needs	Annual Average	Share of Total(%)	Adaptation	Mitigation
Power	11,689	779	51.8	14,731	982	56.3	3	200
Transport	7,796	520	34.6	8,353	557	31.9	37	-
Telecommunications	2,279	152	10.1	2,279	152	8.7	-	-
Water and Sanitation	787	52	3.5	802	53	3.1	1	200
Total	**22,551**	**1,503**	**100**	**26,166**	**1,744**	**100**	**41**	**200**

Source: ADB Estimates, 2017

ten years. More than 60 per cent of this financing gap is likely concentrated in middle-income countries and more than 50 per cent in the power sector. Given this vast demand, capital markets will be pivotal to financing investment, particularly the banks, pensions, and insurance companies that hold more than 80 per cent of institutional assets under management (AUM) in middle-income countries (McKinsey, 2016).

As per ADB estimates, infrastructure investment needs vary considerably by sector (Table 1). The power and transport sectors require the most significant investments. Telecommunications, water, and sanitation are no less critical for an economy or individual welfare and direct investment. Each sector has varying regulatory, governance, and sustainability challenges in different countries. It includes inadequate capacities and skills to identify project opportunities, evaluate projects, prepare feasibility studies;

The Global Infrastructure Outlook – a G20 initiative - provides an indication of relative infrastructure investment needs, taking into account each country's stage of development. It estimates that Asia alone requires $51 trillion investments in infrastructure across all sectors. At current investment trends, this is expected to translate into a cumulative investment gap of between $4.6 trillion until 2030 (GIF 2022). This gap is expected to rise when the achievement of sustainable development goals (SDGs) is taken into account. Global funds are available for investment. A small fraction of more than $100 trillion in assets managed globally and low-yield resources would be enough to plug the financing gap and finance productive and profitable infrastructure. Issues of infrastructure project pipelines, feasibility assessment, and national budget commitments are important factors that inhibit domestic and global savings to plow funds into infrastructure projects.

Infrastructure projects are an international strategy for growth. These are recognized pathways for economic growth, trade enhancement, and narrowing development gaps among regions. Planning for quality infrastructure is indispensable for achieving Agenda 2030 and its 17 Sustainable Development Goals (SDGs). Investing in infrastructure helps integrate national markets and connect global value chains. Infrastructure growth is trade-enhancing and enables direct investments in countries. Moreover, planned infrastructure development improves the economy's productive potential but requires careful calibration of cost and benefit, quality infrastructure, land acquisition, sustainable financing, and transparency of the projects. Regulatory policies and capacity issues add to the list (Prakash, 2020). Promoters of infrastructure projects and prospective investors are usually left on their own to achieve this objective and resolve the difficult triad of attracting investments that promise returns, project governance, and sustainability.

Connectivity-related infrastructure plans that cater to new supply chain linkages, whether for trade in goods or services or the digital economy, will be subject to efficiencies and markets. At the same time, the global discourse on balanced, sustainable, and inclusive growth shifts the emphasis on economic corridors that can stimulate two-way trade between economic agglomerations within Asia and between Asia, Africa, and Europe. International Cooperation among

governments for such infrastructure promotion is now more important than ever. The Australia-Japan-India Supply Chain Resilience Initiative, the Australia-Japan-US linkages, the Asia Africa Growth Corridor (AAGC) are examples of infrastructure planning and investments where government cooperation is the primary impulse. The G20 principles of quality infrastructure are important tools in this cooperation. More wide-ranging investment cooperation among G20 members is the need, especially in the post-pandemic rebuilding phase when financial liquidity is an important concern for all members.

Multilateral Cooperation for Investment in Infrastructure Projects

The general principles of multilateral cooperation for investment in infrastructure are already available in the G20. The G20 Principles of Infrastructure Project Preparation have introduced robust and transparent infrastructure planning and pipelines, improved business cases and project stage gate controls, and the development of business case methodologies (G20, 2018). The G20 Principles for Promoting Quality Infrastructure stresses the need to scale up infrastructure investment and provides the impetus for sound governance and transparency in infrastructure projects.

These principles reflect the global consensus on quality infrastructure planning and investment but are voluntary. Connecting the diverse requirements or managing the complex triad of finances (investments and returns), governance (planning, implementation, and maintenance), and sustainability (environment, resilience, and inclusiveness) of infrastructure projects requires multilateral cooperation mechanisms to ensure prompt compliance. Collective decision-making is especially needed when an infrastructure scheme spans national boundaries, and the alignment of cost and benefits may be contested (Hawke and Prakash, 2016).

Funding infrastructure around the world should not be an issue when financial resources are available. Apart from the public sector and central banks in advanced economies, institutional investors such as insurance companies, pension funds, and sovereign wealth funds have around $100 trillion in assets under management globally (Arezki et al., 2017). Mobilizing these finances for investment in infrastructure is a critical issue. There are institutional issues, too, arising from managing the interaction of international pressures on national autonomy. There are practical aspects of the unified or standard regime for the movement of goods, services, and people. The governance mechanisms and standards would also include technical specifications, safety management frameworks, the social and economic well-being of workers in the sector, competition policy, customs cooperation, etc (Prakash, 2019).

With governments as the main drivers of multilateral cooperation, the critical role of Multilateral Development Banks (MDBs) and other Development Finance Institutions (DFIs) in blending public and private finance to scale up financing for infrastructure will be necessary. The Hamburg Principles have welcomed the role of the MDBs in mobilizing and catalysing private capital and endorsed a target of increasing mobilization by 25 per cent to 35 per cent by 2020.

Policy solutions for the planning of land connectivity projects through cooperation among governments

can create global standards and governance rules for infrastructure-related connectivity plans. Employing good governance and accountability as drivers, the plans must work towards the goals of sustainable development and inclusive growth. When connectivity plans converge with regional, national, and global development priorities, implementing and monitoring programs become easier.

Finally, the monitoring and regulatory mechanisms must ensure that connectivity plans are not used as a foil for regional leadership – nor can they be used to export debt problems in the promoter country or group of countries. Policymakers are working towards global standards on contemporary issues such as taxation, digital finance, internet, data ownership and transfer, and artificial intelligence. A global consensus around climate change, the Sustainable Development Goals, multilateralism, and international trade is also being renewed. Logically, global (and regional) mechanisms for monitoring and regulating connectivity plans should ensure that these plans enhance economic and social well-being amongst people and create trust amongst partners. (Prakash, *ibid*.)

Centralized infrastructure development planning can align different stakeholders' interests, budgets, and resource availability. A specific example of port infrastructure is four main stakeholders whose interests and capabilities should be examined: public policymakers, internal stakeholders, community groups, and market players. Establishing a task force under a presidential regulation is necessary to integrate different stakeholders. A cloud-based common data environment should assist the task force as a communication management platform and as the only source of truth.

Several schemes of sea toll subsidies cover operational ship subsidies, container subsidies, and cargo subsidies. Each type of subsidy has advantages and disadvantages associated with the level of effectiveness and efficiency that can be achieved. It is necessary to have a just, effective, and efficient subsidy mechanism in the future. In other countries, subsidies are applied to increase operator income, for example, direct subsidies, tax reductions, risk transfers to the government, and indirect transfers. In addition, it can also be done in the form of subsidies for production factors, such as labor, capital, energy, infrastructure, and knowledge transfer (OECD, 2019). One of the proposed subsidy programs that can be implemented on sea toll is a subsidy to reduce double handling, especially in the hub and spoke operation scheme.

Conclusion

The G20 is mandated to promote mechanisms for cooperation among governments. The rebuilding of economies and infusion of financial liquidity into infrastructure development are important concerns of the G20 for the next few years. A framework for government cooperation to facilitate infrastructure investment is essential for regional and inter-regional connectivity and new supply chains. The G20 encompasses member countries and financial institutions promoting several infrastructure plans in Asia, Africa, and Europe. As G20 is committed to providing the frameworks for innovative governance and cooperation mechanisms, it must evolve and endorse a government cooperation program amongst countries and MDBs to facilitate seamless planning

and investment in infrastructure projects that promote new supply chains and connectivity. From a structural alignment perspective, the TIWG and the IWG, along with the Development Working Group must work together to create synergy among the G20 members' outlooks and facilitate the G20 working processes on infrastructure and supply chains seamlessly as the presidency moves from one country to another.

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Research Article

Rise of Fintech: Opportunities and Challenges

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Abstract: Rapid adoption of fintech worldwide has invited attention of investors, policymakers and regulators alike. Interestingly, growth in transactions by fintechs is prominently noticed in emerging markets and developing economies in the recent years. India is among the countries that are experiencing higher rate of fintech adoption. While fintech solutions appear attractive from the perspective of customer comfort and technological sophistication in faster processing of service requests like retail loans, insurance, wealth management and other customised services, central bankers and regulators visualise gaps in existing regulatory frameworks to address the risks emerging from fintech-based financial transactions. This paper presents broad features of this evolving industry in India and the world.

Introduction

The global financial technology (fintech) industry has evolved in multiple stages over the years. Tracing its origins back to the pioneering developments of the 19th and 20th-century financial services sector and transforming through the 2008 global financial crisis (GFC), the fintech industry underwent another transition with the onset of the Covid-19 pandemic in 2019. The expansion of fintech has been regionally disparate, remaining concentrated in premier financial hubs of the advanced economies; only recently gaining traction in emerging markets and developing economies (EMDEs) of Asia and Africa. However, despite its rising prominence, fintech remains mired in ambiguities over its industry structure, associated risks, and optimal regulatory design, thereby sustaining the interest of policymakers, industry professionals, and academics alike in deconstructing its complexities.

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Fintech, widely regarded as a 'disruptive' industry, can produce significant outcomes for the growth and investment prospects of an economy. Uptake in fintech services increased in the recent years due to both supply-side and demand-side impetus, catalysed by collapse of the international banking industry in 2008. This ceded ground for innovative platforms to undertake delivery of financial services, thereby allowing fintech activities to scale up. There was also a concomitant decline of consumer trust in the 'traditional'[1] banking sector, which substituted demand towards new players. As a result, fintech has snowballed into an industry that has carved a niche for itself. Rising investments are testimony to the perceived and actual potential of the global fintech industry. As per estimates by KPMG Global (2021), US$98 billion worth of investments has been recorded in fintech during the first half of 2021, over a 12.6 per cent increase from investment levels in second half of 2020. Out of this, the venture capital investments in fintech amount to $52 billion. The United States accounts for the largest share of fintech investments, worth over US$42 billion. More importantly, fintech investments across borders have increased markedly, indicating the sound potential for cross-border investments in the future.

Evolution of Global Fintech Sector

Global fintech sector registered steady growth over time. In fact, most of the G20 countries are leading innovators and adopters of fintech. Other than their investment potential, fintech platforms have also become central to the retail payments domain. For instance, the percentage of people aged 15 years and above who used a mobile service or the internet to access funds deposited with a financial institution account. Many high-income countries, especially those in the Nordic region such as Norway (85 per cent), Denmark (83 per cent)[2] Finland (80 per cent), and Sweden (79 per cent) boast of high market penetration of such fintech services. Among the low-income countries, Zimbabwe and Mozambique report 11 per cent and 10 per cent coverage respectively. Middle-income countries also account for a sizeable fintech sector. Interestingly, many middle-income countries that feature among the topmost users of fintech services are situated in the East Asia and Pacific region- China (40 per cent), Mongolia (38 per cent), and Malaysia (32 per cent). While it indicates a higher prevalence of fintech usage in countries that lie ahead in terms of economic progress, it is also to be noted that African countries such as Kenya have spearheaded a transition from traditional financial services to fintech services and have set a precedent for countries through their M-Pesa initiative.

Four factors broadly account for the rapid growth of fintech globally. First, technological advancement has made cutting-edge technologies extremely accessible. From primitive double-entry book-keeping to innovations such as the Internet of Things (IoT) and Distributed Ledger Technology (DLT), increasing sophistication in technologies is fuelling diversification of financial products and services;[3] Second, diversification of financial products and services offered innovative technological platforms. Initially, fintech services remained limited to lending activities. With greater innovation and competition, it now includes a gamut of services such as robo-advisory, personal finance management, P2P lending, wealth management, etc. Consequently, the industry structure expanded to include segments such

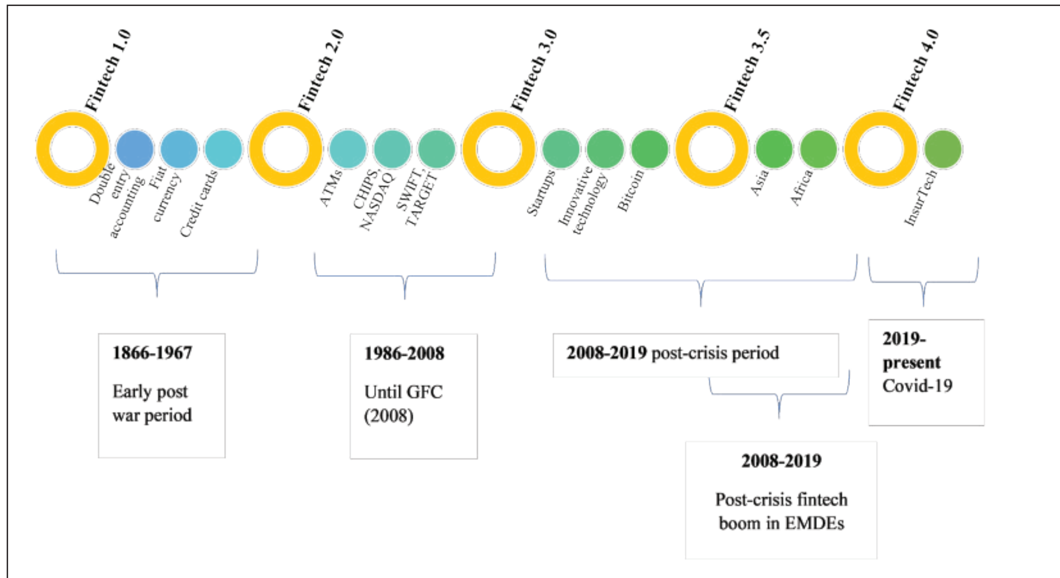
as RegTech (regulatory technology), InvestTech (investment technology), and InsurTech (insurance technology). The expanded coverage was manifested in terms of higher number of people and industries impacted by fintech. From industry professionals to laymen, banking industry to real estate, micro-enterprises to conglomerates, the global footprint of fintech has seen remarkable expansion. The entry of new players resulting in greater competition has widened the outreach of services, cutting across socio-economic and regional boundaries.

Fintech, as we know it today, owes its present form and scope to game-changing developments of the 19th and 20th centuries. It is possible to identify four distinct phases of fintech evolution (Figure 1). The early post-war period (1866-1967) marks the beginning of Fintech 1.0 which is characterized by the novel double-entry accounting system and fiat currency. Credit cards made their debut in the United States during this period. Fintech 2.0 marks the emergence of what is today referred to as the 'traditional' digital financial services with the invention of calculators and automated teller machines (ATMs). This resulted in digitalization and globalization of finance, especially in the developed countries of the world. During this period, the United Kingdom established the Inter-Computer Bureau (1968) for conducting payments and the United States set up the Clearing House Interbank Payments System (CHIPS) in 1970. This was followed by NASDAQ in 1971. To accommodate the increasing globalization of finance, the Society of Worldwide Interbank Financial Telecommunications (SWIFT) was set up in 1973 to speed up transactions in the interbank domain. By the late 1980s, the financial services industry was largely a digital sector, at least for internal operations. Further, the year 1999 saw the setting up of the Trans-European Automated Real Time Gross Settlement (TARGET). In a similar typology of fintech evolution observed by Puschmann (2017), the initial phases until 2010 were essentially a period of "internal digitalization". This was followed by "provider-oriented digitalization". Finally, digitalization became "customer-oriented" around 2020.

The initial phases of fintech evolution largely had incumbent financial firms experimenting with new technologies to aid financial transactions. It was with the invention and widespread use of the internet in the 1990s that the financial services industry catapulted into a completely digital space. As the 2008 global financial crisis unfolded, it revealed multiple fault lines in the industry. New regulatory issues emerged demanding attention from policymakers and regulators, providing an opportunity for new players to gain traction with their innovative portfolios of financial services and products. This became the defining feature of Fintech 3.0 (Arner et al., 2015; Thakor, 2020). Complemented by significant advancement in technology which resulted in efficiency gains and cost savings, Fintech 3.0 marked a new era. Notably, most of these developments in the financial industry remained concentrated in the Western hubs of finance such as London (UK) and New York (the United States). Recent financial hubs such as Shanghai still lag behind indicating regional disparities in the coverage of fintech services.

Regional disparities in the global expansion of fintech are best captured by Fintech 3.5 (Arner et al., 2015). Owing to the unique developmental trajectories of economies in the Asian and African regions, the deferred adoption of fintech here warrants special focus. Frost (2020)

Figure 1: Timeline of Events in the Global Fintech Evolution



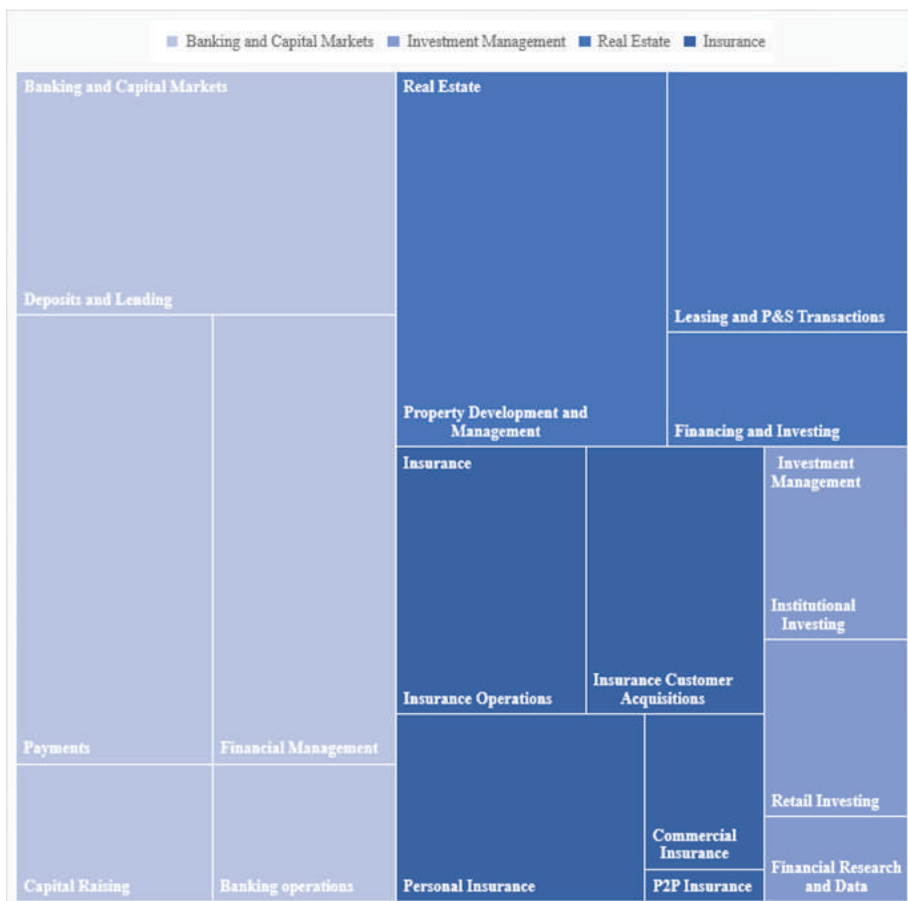
Source: Adapted and augmented from Arner *et al.* (2015).

investigates this uneven adoption of fintech services. For the Asian and African economies that are deficient in resources such as technology and skilled professionals, fintech uptake is accelerated primarily by unfulfilled demand for fintech services. This pattern differs from advanced economies which are characterized by presence of sound regulatory environment and high unit costs of traditional financial services (Philippon, 2016). Developing countries in the Asian region enjoy a demographic advantage. Large young population enables faster transition to fintech as they are more receptive towards fintech innovations and services. Even for countries within the same region such as the Asia-Pacific, diverse patterns of fintech adoption might result due to socio-cultural and legal differences. In Australia, for instance, competitive pricing is the deal-breaker for consumers who must choose between fintech services and traditional services. This factor is also dominant in driving the uptake of fintech in the United States and Europe. Among the Asian countries, South Korea, Hong Kong, Japan and Singapore exhibit similar preferences. Yet, the behavioral inertia of traditional run-of-the-mill digital financial services might be hard to overcome (Chen, 2021). The Global Fintech Adoption Index released by Ernst and Young (2019) similarly reports very high rates of adoption among the Asia-Pacific countries. India and China are among the leading countries for fintech adoption, measured as a percentage of digitally active population in each market.

Any global economic shock has the potential to significantly transform the fintech industry. While the global financial crisis of 2008 was purely an economic shock, the covid-19 pandemic originated as a health catastrophe with far-reaching implications for fintech. This marked the beginning of Fintech 4.0. At the outset, financial activities such as banking operations have been the frontrunners in adopting

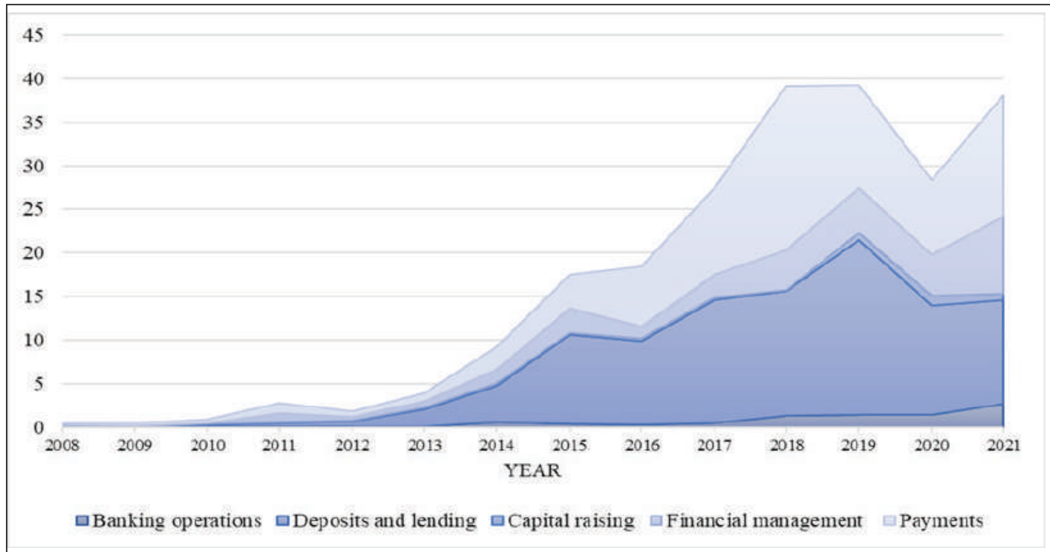
technological advancements and hence most of the fintech developments occur predominantly in this sector. In fact, it may be appropriate to denote the pre-GFC phase of fintech innovations simply as 'Banking IT' (Alt et al., 2018). Although simultaneous developments taking place in the insurance industry over the past several decades were less pronounced as compared to changes in core financial activities (particularly banking), Fintech 4.0 was likely to witness a surge in insurance sector investments (Deloitte, 2020). Insurance fintech (InsurTech) registered relatively modest growth immediately after the 2008 crisis. However, in the years where other segments depicted steep decline, insurance retained its edge. This decline mirrored a rise in mergers and acquisitions (M&A) in the industry. In fact, M&A deals involving fintech firms were on the rise. Interestingly, at onset of the pandemic, M&A deals were higher in first half of 2020 compared to their levels in the preceding year. However, the aggregate deal value registered a decline

Figure 2: Number of Fintech Startups Globally during 2008-2020, by Verticals and Sub-Verticals



Source: Based on data from Deloitte Interactive Fintech Tool. Verticals and sub-verticals are based on Deloitte classification.

Figure 3: Funding in the Banking and Capital Markets Sub-verticals during 2008-2021



Source: Based on data from Deloitte Interactive Fintech Tool; Note: Funding includes consolidated investments from the following sources: seed, debt financing, private equity, venture capital and others.

of over 32.6 per cent and stood at US$ 25.6 billion. This pattern was non-uniform across various regions of the world. In the United States and Europe, budding (early-stage) firms were faced with acute funding shortage whereas big players in the market continued to receive sound late-stage funding. Asian economies retained funding from BigTech firms despite the vagaries of the pandemic. For example, Facebook invested US$ 5.7 billion of equity funds in the Indian giant Reliance Jio.

Verticalization in the fintech industry is often fluid due to its constantly evolving landscape. Nevertheless, common verticals encompass the following activities: (i) credit lending, depositing and capital raising, (ii) payments and settlements, (iii) wealth/ investment management: personal and commercial, (iv) banking activities (often called Banktech), (v) insurance activities (InsurTech), (vi) RegTech. Not all verticals are equally dominant. This is evident from Figures 2 and 3 which depict respectively the number of fintech startups in the world over the period 2008-2020 and investments received during the same period.

As clear from Figure 2, most fintech startups make inroads through the banking and capital markets vertical. Within this most of the startups provided deposit, lending and payment services which are traditionally associated with banks. Real estate also comes across as a leading sector in terms of fintech startups. Insurance segment remains relatively subdued. However, it must be noted that the trend might reverse drastically due to the pandemic. P2P insurance remains insignificant compared to the number of fintech startups in other insurance sub-verticals. Figure 3 highlights trend of investments in the sub-verticals of banking and capital markets.

Deposits and lending activities received the higher shares of funding after 2012. Payments and settlement

firms attracted sound investments. Interestingly, capital raising and banking operations fared relatively poor on this front. This may not be difficult to justify given that firms specializing in deposits and lending were already conducting some of the core banking activities. This also begs the question of how fintech deposit and lending activities, in particular P2P lending (peer-to-peer lending) can be fundamentally different from the core banking functions.

The friction between incumbent banks and fintech startups represents two divergent schools of thought which may be distinguished based on the degree of cooperation expected between the two entities. Fintech startups may be viewed by banks as a competitor or as a complement. Much literature explores the two schools of thought, with greater support being offered to the latter. Bömer and Maxin (2018), for instance, argue that the bank-fintech collaboration benefits the fintech firms on three accounts. First, banks facilitate smooth market entry for fintech firms as they are familiar with the regulatory environment. Second, ease of market access results in diversification of products, which is aided by capitalizing on established networks in the industry. Thirdly, bank customer base doubles up as clientele for fintech firms. Existing trend of such collaborations takes varied forms with an objective of mutual benefit. In response to fintech entrants, a bank might either continue its business as usual, create its own version of the entrant's innovation, collaborate and become an 'ally', acquire the fintech firm or might give in to the threat of competition and exit the market. Banks may interact with fintech firms in the capacity of an institutional customer, leveraging the technological innovations of the fintech to enhance its service delivery mechanisms to customers (Drasch et al., 2018; Anand & Mantrala, 2019). Thakor (2020) also sheds light on this by distinguishing between banks and fintech firms based on the type of services provided, capital structure, objective functions of the respective platforms and some regulatory issues. P2P lending platforms serve to match borrowers and lenders directly without a central authority such as a bank. It screens the participants and identifies the degree of risk involved in the transaction. Importantly, the platform does not invest its own financial resources in the process. This is unlike a typical bank which mediates between the borrowers and the lenders and tranches the deposits to various borrowing entities. Importantly, this indicates the type and degree of risk involved in the same activity undertaken by banks and those by fintech firms can vary. Despite the overall share of P2P lending being small compared to banks, these services are gaining popularity among businesses and individuals alike who prefer faster transactions and lower costs and regulations.

Against the backdrop of global transition towards fintech, it is crucial to understand the motives and drivers of fintech in developing countries such as India, which exhibits some favourable conditions such as a young population and large market, but is also challenged by lack of consumer trust and a massive unbanked population. The next sub-section highlights some of the important developments in the Indian fintech landscape.

Fintech in India

India has emerged as one of the fastest growing fintech markets in the world (Rajeswari and Vijayi, 2021). It ranks first in the Global FinTech Adoption Index 2019 with an adoption rate of 87 per cent marking a considerable increase from 52 per cent in 2017 and outperforming major

Table 1: Fintech Unicorns in India

Sl. No	Unicorn Company	Sector	Valuation (US$ Billion)	Year of Getting Unicorn Status	Year of Founding
1	BharatPe	Payments	2.8	2021	2018
2	Zeta	Payments	1.4	2021	2015
3	Groww	Wealthtech	1	2021	2016
4	Cred	Payments	2.2	2021	2018
5	Digit	Insurtech	1.9	2021	2016
6	RazorPay	Payments	1	2020	2014
7	Pine Labs	Payments	1.5	2020	1998
8	BillDesk	Payments	1.5	2018	2000
9	PolicyBazaar	Insurtech	1	2018	2008
10	Paytm	Payments	16	2015	2000

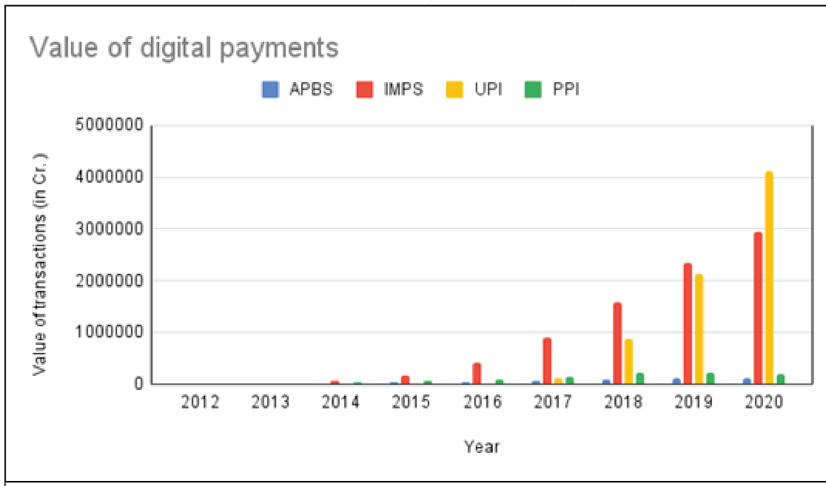
Source: Venture Intelligence

Fintech markets in the world like UK, Singapore, Switzerland and the United States (Ernst and Young, 2019). Six of the world's 100 leading Fintech cities are located in India, namely, Mumbai, Bangalore, New Delhi, Pune, Hyderabad, Chennai, and Ahemdabad, making India an emerging Fintech hub (Fintech Index 2020). Currently, there are about 5,495 fintech startups operating in India mostly concentrated majorly in the metropolitan cities like New Delhi, Bangalore, Mumbai, and Hyderabad. (RBI, 2020 ;Tracxn, 2021).

Table 1 shows some of the major fintech firms in India. These firms have achieved the unicorn status i.e they have achieved valuation greater than US$1 billion. As the table shows, out of the 10 fintech unicorns in India, 7 belong to the payment segment. Interestingly, fintech in India is driven majorly because of the payment segment. In 2020, 96.2 per cent of payments were digital i.e. payments made through UPI, IMPS, prepaid payment instruments, etc. This number grew from 84.6 per cent in 2012 to 95.4 per cent in 2019, to 96.2 per cent in 2020,[4] indicating significant permeation of financial technology in Indian payment landscape. If it continues to expand at the current pace, complete payment digitization could be achieved in a few years down the line.

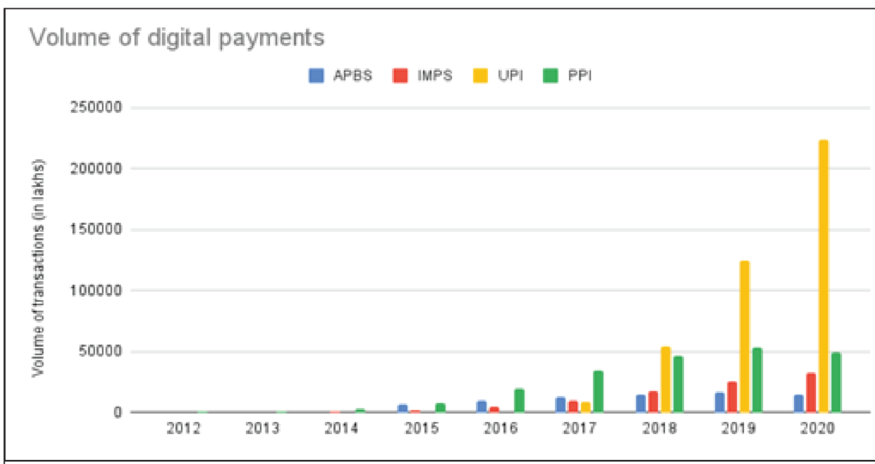
Within the payment arena, UPI payments have grown markedly well and have driven the growth of the digital payments segment in India (MOC, 2019). Figure 4 shows how digital payment platforms have changed the face of digital payments in India. Before 2015, the use of digital platforms like prepaid payments instruments, ABPS and IMPS was very low. However, with the launch of UPI in 2016 both the value and volume of digital payments gained momentum (Figure 4 & 5). As of September 2021,

Figure 4: Value of Digital Transactions across Various Platforms (2012-2021) in India



Source: Authors based on data from RBI's Handbook of Statistics.

Figure 5: Volume of Digital Transactions in India



Source: Authors based on data from RBI's Handbook of Statistics.

India has recorded 3.65 billion UPI transactions worth US$ 6543.52 Billion; 11 times more than the level three years ago,[5] transitioning towards India's dream of a "less-cash society".

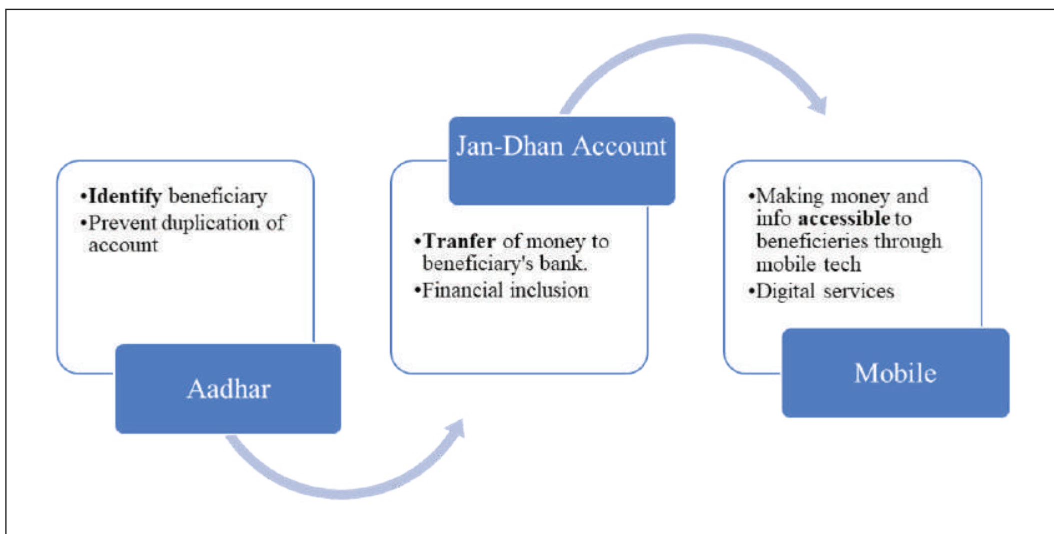
Though the digital payments segment dominates the fintech sector, other segments are catching up well. InsurTech is pushing insurance product innovation, and digital distribution is increasing product penetration across the population. WealthTech is altering the investment environment and attracting a large number of new stock investors. Solutions like Buy Now Pay Later is reinventing credit in India allowing use of digital credit at the point of purchase (Naker, 2021). Digital lending is making use of alternative data to alleviate the problem of credit score limitation for many businesses particularly MSMEs, as lenders can utilize this data to

determine the creditworthiness of any business. It also employs Distributed Ledger Technology (DLT) and process automation to lower the costs and time involved in the lending process, making small amount loans by banks sustainable thereby expanding MSMEs' access to funding (Creehan, 2019).

A similar trend can be observed in the investment pattern. The investment pattern supports the result that it is the digital payments arena which has revolutionised fintech in India. Abidi (2021) discusses the trend and evolution of fintech sector during the period 2006-2020 in terms of investment, no of rounds of funding, fintech unicorns, etc. Based on data trends, he divides the time period into two phases: 2006-14 and 2014-20, noting 2015 as the breakout year for the growth of the fintech sector. Since 2015, the Indian fintech industry has seen an increase in the amount and number of rounds of funding. About 320 distinct fintech firms raised more than US$11.77 billion from venture capital firms in 759 investment rounds during 2006-2020. Comparing investments in fintech with overall BFSI sector, it was observed that the number of funding rounds in fintech firms rose to 71.8 per cent of the total number of funding rounds in the overall BFSI sector, from 19.2 per cent in 2010. In terms of amount of fintech funding accounted for one-third of total BFSI funding in 2020 (Figure 6).

A closer look at Figure 7 highlights the dominance of the payment vertical followed by InsurTech and lending for the entire period of 2006-2020. In 2019-20, 211 fintech firms raised US$3.18 billion, out of which approximately two-third went to the top 10 companies and almost one-third was raised by Paytm alone (RBI 2020). Nevertheless, lending and InsurTech saw a noticeable increase in the funding in phase-2 relative to phase-1 indicating emergence of these segments as well. Based on the investment trend

Figure 6: PE/VC Investment in BFSI and Fintech Companies



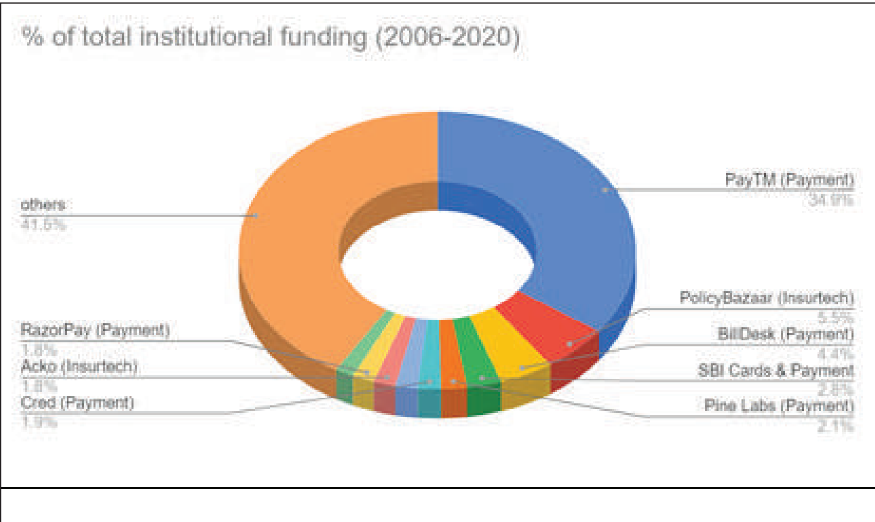
Source: Authors based on data from Abidi (2021)

over the last decade, it is likely that fintech will attract more investment in future funding rounds.

The significant rise of fintechs in the last decade can be attributed to access to innovative solutions, increased penetration of smartphones and internet, low cost and easy-to-set up accounts, faster experience, good quality of service, existing inefficient traditional players, under-served customers segment, and preponderance of younger and tech-savvy population. However, the government's policy interventions have been the most influential driving force in the widespread adoption of fintech in India (Abidi, 2021 and RBI, 2020). The evolution of India as a fintech nation is the result of various government initiatives aimed at building digital infrastructure, popularly known as India Stack, in order to achieve greater objective of financial inclusion and a cashless economy. It includes Aadhaar (digital identity for all citizens); Jan Dhan Yojana (account opening of over 200 million unbanked population); creation of platforms to move money like UPI, IMPS, etc.; and opportunity for financial institutions and fintech to innovate (Vijayi, 2019 ; MEDICI, 2020).

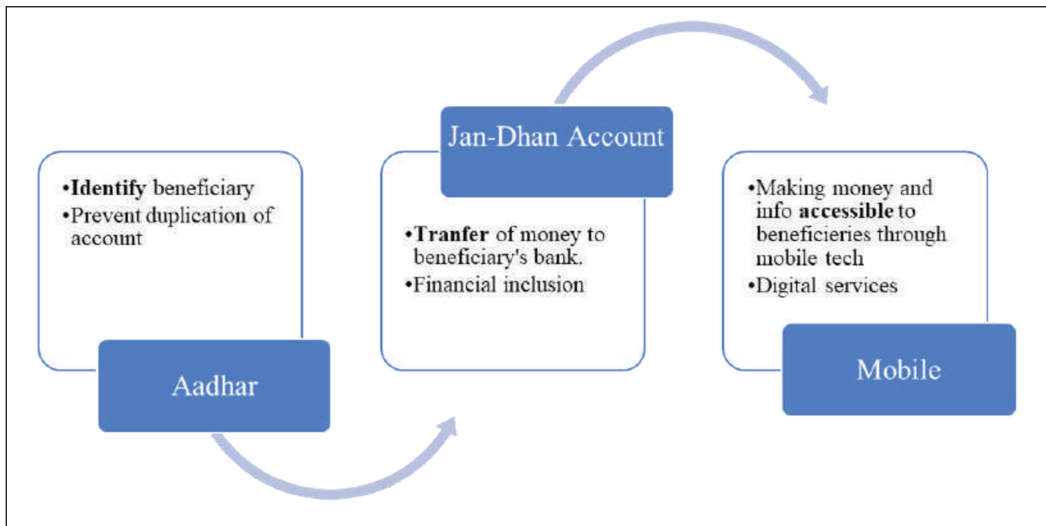
The four-layered framework of Jan-Aadhar-Mobile (JAM Trinity) initiative led to widespread digitization in India and has boosted the growth of fintech. JAM is a digital pipeline created by the government that links digital identity Aadhaar, Jan Dhan bank accounts, and mobile payment platforms/ banking primarily to provide financial assistance to, and facilitate financial inclusion among the poor. It has been used by the government in distributing benefits across a wide range of programs like MNREGA, PAHAL, PMGKY, PM-Kisan etc. It has enabled large scale implementation of Direct Benefit Transfer (DBT) solely through digital identity number. JAM

Figure 7: Top Indian Fintech Beneficiaries of Institutional Funds



Source: Authors based on data from Abidi (2021)

Figure 8: Mechanism of JAM Trinity



has used fintech to unlock the barriers that exist for the poor, and facilitated financial inclusion.

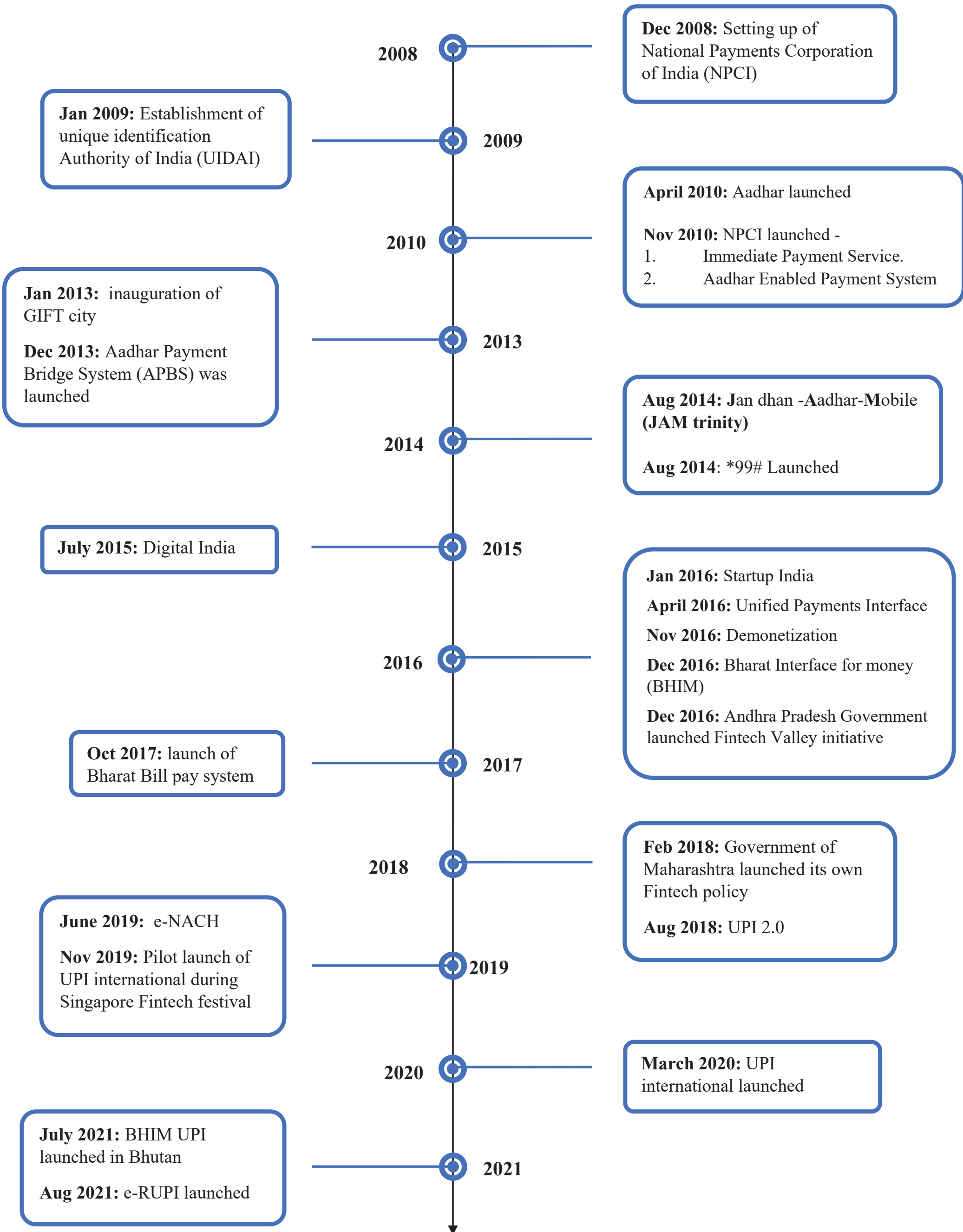
Another popular game-changing initiative by the government is UPI. UPI has gained popularity across the world and has also been launched in Singapore and UAE in 2020. In addition, UPI international is expected to solve the scarcity of payment options due to currency conversion issues and non-availability of international credit or debit cards (Pwc, 2020). After Singapore, Bhutan has also launched BHIM UPI making payments between the two countries seamless.

Besides the JAM trinity and UPI there are initiatives such as Digital India, e-RUPI, etc. that have contributed to the growth of fintech. Below is a timeline of all such initiatives launched by government of India that directly or indirectly promoted the fintech ecosystem and created an environment that enabled it to grow (Figure 9).

Some state level initiatives are also worth mentioning here. The government of Maharashtra became the first state to announce the fintech policy in 2018 with a vision to create a fintech ecosystem in Mumbai and become one of the leading global fintech hubs (Elanyaraja and Vijayi, 2020). Small cities are also making efforts to attract fintech investment. Likewise, the government of Andhra Pradesh launched a project called the Fintech Valley in Vizag in 2016 to promote business infrastructure and attract institutions to invest in the state (Muthukannana et al., 2020).

The trends that have emerged in the past decade suggest that the rise of fintech has brought about a paradigm shift in the financial service sector. However, a lot of uncertainty exists right now in terms of the role of traditional financial institutions and its synergy with the new fintech start-ups. Jadwani (2016) mentions that the impact of fintech on banking sector in India fuelled by changing consumer behaviour will reshape the Indian financial services landscape. She believes that new fintech firms have caused disruption in the banking sector; however, banks can view this as a threat and lose market share,

Figure 9: Policy Milestones in Indian Fintech Sector



or as an opportunity to collaborate and innovate in order to provide a better user experience to their customers.

On the other hand, Saroy et al. (2020) referring to the force of creative disruption firmly states that fintech would not disrupt the financial services industry rather it complements it. Both have distinct comparative advantages and by working together they can benefit from each other. In fact, it has been observed that banks are launching, investing and, collaborating with fintech firms, and they no longer see them as threat. With the potential of becoming a world leader in the fintech sector, India has embarked upon its digital journey and is catching up with the global players. It has become Asia's leading destination for fintech deals, leaving China behind, partly due to rising valuation of fintech firms in India.[6]

Regulatory Issues in Fintech

Rapid growth of fintech applications have not only brought ease and speed in financial transactions but also a variety of risks which the existing regulatory framework may not adequately address. The disruptive nature of fintech can potentially threaten a country's financial stability and can compromise the integrity of financial system by exposing stakeholders to risks, thereby jeopardizing the safety of consumers and investors (Taylor et al., 2019). Innovation in financial technology can sometimes amplify existing threats within the financial sector (Saroy et al., 2020). This has necessitated regulators to catch up, consequently spurring innovation in regulation. Therefore, there is a simultaneous evolution, perhaps even a paradigm shift, in the regulatory frameworks adopted to manage risks arising out of unprecedented growth of fintech, as well as its inevitable spillovers into other sectors of the economy. Starting from straitjacket banking requirements, regulation has now expanded to include new approaches such as innovation hubs and regulatory sandboxes.

Fintech Risks: Origins and Implications

A key distinction between standard financial risks and fintech-specific risks is the ease (or lack thereof) in decoding their exact nature. At the confluence of finance and technology, fintech risks are 'hybrid' in nature. Herein lies the challenge of mitigating and managing these risks. The threat of money laundering and terrorism finance looms large with the advent of sophisticated technologies. Regulatory perimeter must therefore be adjusted to deal with such threats through rules for anti-money laundering (AML) and countering finance of terrorism (CFT) (Restoy, 2019). Fintech activities, operating in a largely virtual realm, can easily transcend national boundaries. This feature, while it brings multiple benefits in the form of increased efficiency and outreach, can be potentially dangerous due to the possibility of regulatory arbitrage. As Magnuson (2018) remarks it would be counterproductive and risky wherein fintech firms engage in "race-to-the-bottom"[7] by categorically expanding operations in jurisdictions where the regulatory regime is relatively lax. To account for such risks, regulators across countries must standardize regulations by creating "fintech bridges" that may take the form of consultation platforms, roundtables, workshops, and working groups.

On a macroeconomic scale, technologies that foster a high degree of interconnectedness between financial institutions, especially those integrated through cross-border activities, can increase the risk of systemic failures by creating institutions that are 'too-big-

to-fail'. Such institutions together form a monopolistic/oligopolistic structure in the industry making it vulnerable to abuse of power by big players. Risks of concentration from third party intermediaries become pertinent in this regard (Crisanto et al., 2021). This exposes consumers and investors to risks that arise from information asymmetry in the fintech industry. Unscrupulous practices such as misappropriation of user data and unethical sale of products can risk consumer privacy and erode trust. From the service providers' perspective, the lack of regulatory certainty can cause inefficiencies (Amstad, 2019; Restoy, 2019).

While most of the risks trace their origin to the service providers, Jenik and Lauer (2017) argue that risks may also stem from consumers' limited understanding of new fintech services. Risks might also occur if the regulators do little to quell uncertainty regarding their stance and the future outlook for the industry. The basis of these risks can be either domestic (internal) or international (external) (Magnuson, 2018). Due to the trans-boundary penetration of fintech activities, it is crucial to determine the degree of regulatory intervention permissible by foreign authorities while also retaining sovereignty of domestic policies. Finally, systemic risk in particular arises from the excessive interconnectedness among financial institutions and bigTechs catalyze this process as they benefit from the "DNA loop- Data analytics, Network externalities and interwoven Activities". BigTechs first work on customer acquisition to establish a base in the industry. Once this is done, economies of scale usher in through network effects and the increasing mass of customers, which creates an equivalent surge in data. This data is the throughput to enhance service delivery through customization thereby attracting more customers (Crisanto et al., 2021).

The finance industry is not new to cyber risks. However, from the lens of fintech, such risks are magnified multiple times. For instance, cyber-attacks have been reported to cause losses amounting to US$1.45 million since 2013 (Amstad, 2019). The data-intensive nature of this industry further adds to the problem. However, profit-oriented fintech firms seldom pay heed to the social welfare implications of cyber security threats. Data security has always been the regulator's priority and rarely a business motive. As a result, these companies may mishandle data causing users to suffer (Arner et al., 2016a). Exposure to excessive risks and frauds in the financial industry can result in massive loss of consumer trust, which as evidenced from history, will have severe economic repercussions. Regulatory Technology (or RegTech), which is an offshoot from the mainstream fintech industry, serves as a potential tool to improve data reporting and monitoring by the regulators.

RegTech is the use of technology for regulatory monitoring, reporting, and compliance. In order to reinstate the trust of consumers in the financial system after the Global Financial Crisis, regulations were tightened. As a result, the compliance costs increased in the form of regulatory penalties and led to the emergence of RegTech. Although it was devised as a solution for industry players, RegTech has been monumental in transforming the regulatory framework. It facilitates efficient and effective regulation through automation of the regulatory process offering solutions such as continuous monitoring capacity which can be used to identify non-compliers faster and allow them to free excess regulatory capital. Using technology to manage and access data will allow the regulators to conduct

detailed and effective supervision of market participants, reducing risks and the need for regulatory action (Arner et al., 2018).

Macro-prudential policy is another area where RegTech has the potential to serve. This type of policy entails holistic analysis and focus on the interconnectedness of financial institutions to ensure the stability of the entire financial system. It seeks to use massive amounts of data in order to identify patterns and reduce the severity of the financial cycle. This creates the need for RegTech to collect a large amount of data and produce it in a specified format and frequency (Arner et al., 2016a).

Development Connect of Fintech

Fintech applications are increasingly found useful in meeting certain development objectives. With the advent of fintech, large sections of the population- both consumers and producers- which otherwise find it difficult to gain access to credit by the formal financial sector are getting the benefits of customised personal and business loan options. MSMEs often facing difficulty in obtaining financing from traditional financial institutions due to lack of collateral, low credit scores, uncertainty regarding profits, among others can explore fintech platforms. In view of high perceived credit risk, banks and financial institutions refrain from lending to MSMEs. Spillovers of fintech innovations into e-commerce platforms can help leapfrog towards inclusion of small and micro enterprises. Financial technology can potentially expand the access to finance for MSMEs. With the use of technology, the problem of lack of credit for MSMEs can be addressed while also simplifying and speeding up the lending process. It is also useful for firms which undertake R&D activities for innovative projects but are unable to acquire credit from conventional sources (Xiang et al., 2018).

Trade finance, for example, entails a lot of paperwork and is a time-consuming procedure with numerous stages and intermediaries, making it inefficient. As with other types of SMEs financing, the more inefficient a process, the less likely it is to be able to sustain service to smaller consumers and can stymie MSMEs' trade opportunities. DLT or blockchain technology can provide a unified mechanism for tracking various steps in the trade finance process, making it more efficient. Alternate data generated as a result of businesses engaging more in online activity (such as online payments and sales) can alleviate the problem of credit score limitation for many MSMEs, as lenders can utilize this data to determine the creditworthiness of any business. Automation of labor-intensive operations such as compliance and legal functions can reduce the time and cost of issuing loans (paperwork like drafting of the loan agreement) making small amount loans profitable and hence viable for MSMEs (Creehan, 2019).

Open banking is another tool that can contribute to the growth of MSMEs. Banks or fintechs in some nations offer additional services to MSMEs such as online accounting packages which reduce their time spent on bookkeeping and allow them to focus more on their operations. These solutions are also integrated with internet banking which allows easy and quick payments such as tax payments and salary rollout. Banks also get the additional information about the credit history of the MSMEs. Since invoices are also becoming more digitised, financial institutions can track them and extend credit based on them. The use of blockchain contracts or centralised

digital platforms may standardise invoice format, making it easier to verify, trade, and finance (Mahuzier, 2019).

Exclusive access to credit and discrimination based on credit position form the basis of traditional financial industry. Fintech contrasts this through its wide availability, accessibility, and affordability can reach to people at the grassroots. Philippon (2019) argues using the example of robo-advisory that emergence of fintech can reduce costs and increase efficiency in a way that makes fintech services more inclusive. It can increase coverage to such sections of the population which had hitherto been excluded. Financial inclusion is a pressing need in poor countries By facilitating credit scoring of small borrowers who are unable to access conventional credit, it can be game-changing for EMDEs which are characterized by a large unbanked population and poverty (Bazarbash, 2019). The M-Pesa initiative in Kenya is a case in point. This mobile money transfer service which was launched by Safaricom in 2007, has completely transformed the retail and micro payments landscape in Kenya, with interesting takeaways for other EMDEs. It is a multi-purpose service which allows users to deposit, withdraw, transfer and pay money using the mobile phone.

Conclusion

Fintech has revolutionized the way in which financial services are designed and delivered. While it has become a worldwide phenomenon, emerging markets and developing economies especially in G20 are experiencing faster growth of fintech sector. With increasing popularity as well as utility, fintech hints at a promising growth in the years to come. However, this demands simultaneous adjustments in the regulatory perimeter, in order to account for the unprecedented risks associated with a dynamic fintech industry. With the rising popularity of regulatory sandboxes and other innovative regulatory regimes, it is likely that the risk factor in fintech can be kept under check. A high-functioning digital economy can only sustain if it is based on the principle of inclusivity. Fintech has made huge strides towards achievement of this objective through initiatives such as M-Pesa which bring marginalized sections of society into mainstream digital economy. Future course of research might explore the growth potential of fintech, along with a focus on international trade in fintech and enabled services.

G20 has acknowledged the growth of fintech segment of the financial sector during the previous presidencies along with crypto assets. In fact, International Monetary Fund (IMF), Finance Action Task Force (FATF), International Organisation of Securities Commission (IOSCO), Bank for International Settlements (BIS) and other international organizations are closely watching this sector for orderly growth and proper regulation. In India, Reserve Bank of India has opened a new department for fintech to closely monitor the growth of this sector and associated policy developments.

Endnotes

1. Traditional banking sector is often associated with brick-and-mortar banks, i.e., characterized by physical presence, and engaging in lending and borrowing operations.
2. Percentage figures are for the year 2017, taken from the Global Findex Database 2017
3. Table A1 in appendix summarizes some of the common financial technologies and their applications
4. Author's calculation based on data from RBI's Handbook of Statistics

5. Author's own calculations based on data from NPCI
6. See Aditya, Anisha (2021).
7. Typically refers to the phenomenon where manufacturing companies in rich countries shift their activities to poor countries where regulations are biased against the interests of workers and environment. Firms therefore compete with each other to establish their units in countries which are most deregulated.

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Table A1: Common Financial Technologies and their Application in Fintech Services

Financial Technology	Description	Application of technology in financial service provision
Application Programming Interface (API)	It refers to a set of commands/rules/ protocols/ algorithms that allow communication between computer systems and computer software	Used commonly for BaaS (Banking as a Service), peer-to-peer transactions, smart contracts, IoT and seamless payments.
Artificial Intelligence (AI) and Machine Learning (ML)	AI is a technology capable of conducting activities which otherwise required human. When machines are capable of learning from data without human intervention, it is referred to as ML.	AI is used for InvesTech and WealthTech activities. Robo-advisors and chatbots/virtual assistants (such as 'Erica' by Bank of America) are common examples of AI in fintech. ML is often used in RegTech for detecting fraud and ensuring compliance.
Big Data	Large datasets either organized or disorganized, that can be manipulated or analyzed using sophisticated data tools.	Applied data analytics and risk assessment to inform service providers about customer preferences.
Biometrics	Information systems used for identifying and grouping individuals based on measurable human characteristics.	Allow identification and verification of clients to ensure security of information and ease of access. Common examples are fingerprint scans and voice recognition.
Cloud Computing	It refers to delivery of computing services over the Internet. This can include servers, storage, database, networking, software and analytics.	Often used for RegTech such as for secure storage and interoperability. Google Virtual Cloud is an example of company using cloud services.
Distributed Ledger Technology (DLT)	A large record of transactions that can be updated in real time by users and can also be verified, thereby creating a secure 'ledger' of transactions, 'distributed' among participants, without intervention from any central authority.	This decentralized electronic ledger may be especially useful for small businesses seeking funding. Blockchain is a popular example of DLT which facilitates fast transactions, payments and settlement through digital currencies such as Bitcoin.

Source: Adapted from RBI (2017) and Saroy et al. (2020)

Power Ministry Opposes G7's Energy Transition Plans for India

October 13, 2022

The G7 nations' plan of persuading India to start negotiations on a Just Energy Transition Partnership (JETP), an initiative of the rich nations to accelerate phasing out of coal and reducing emissions has hit a road-block. The Power Ministry has refused to give its consent to the negotiations so far, as it argues that coal cannot be singled out as a polluting fuel, and energy transition talks need to take place on equal terms, an official told *businessline*. "While it was decided at the G7 meet in June to move forward in negotiations with Indonesia, India, Senegal and Vietnam on JETPs, New Delhi has not been able to give a go-ahead mainly because of the Power Ministry's opposition," another source said.

https://www.thehindubusinessline.com/economy/power-ministry-opposes-g7s-plan-of-energy-transition-talks-with-india/article66001118.ece

India to Host G20 Investors Conference on Tourism Next Year

October 18, 2022

India will hold a global meet on investments into its tourism sector and a conference on business tourism next year, cashing in on its G20 presidency which begins from December this year. For India, the tourism and hospitality sector is one of the largest employment generators, and has been a major contributor to Foreign Exchange Earnings. "As of now, the focus of global investments in India's tourism sector is on the hospitality industry, especially international hotel chains, but through this investors' conference we will seek to explore fund flow into theme parks, adventure tourism, amusement parks and skiing destination infrastructure," a senior official in the Ministry of Tourism told *The Hindu*.

https://www.thehindu.com/news/national/india-to-host-g20-investors-conference-on-tourism-next-year/article66022672.ece

India's G20 Presidency

November 22-December 1, 2022

G20 leaders announced on Sunday that India will host the summit of the high-profile grouping in 2023 — a year later than what was decided earlier. Prime Minister Narendra Modi on November 27 said that assuming the G20 presidency was a huge opportunity for India and that the country must utilise it by focusing on global good. He said this during his monthly radio broadcast, "Mann Ki Baat". Prime Minister Modi also spoke about the power of music, and the spread of Indian music. Prime Minister Narendra Modi on November 27 said the launch of 'Vikram S' rocket heralded a "new era" for the private space sector in India as he hailed the sector's contribution in the sphere of space technology. India's G20 plans will include a special focus on counter-terrorism, supply chain disruption, and "unity" in world affairs. A key element of India's G20 Presidency will be taking the G20 closer to the public and making it truly a 'People's G20'. To realize this, Citizen engagement and large scale public participation through various Jan Bhagidari activities are planned throughout the year.

https://www.thehindu.com/news/national/india-to-host-g20-summit-in-2023-groupings-declaration/article33156506.ece
https://www.thehindu.com/news/national/indias-g20-plans-will-focus-on-counter-terrorism-supply-chain-issues/article66200085.ece

Biden to back African Union Spot in G20 at US-Africa Summit

December 10, 2022

US President Joe Biden will back a permanent spot for the African Union in the Group of 20 major economies, seeking to elevate the continent's role, the White House said. Biden will make the announcement during a three-day US-Africa Summit that opens on Tuesday in Washington, DC, where the United States will commit to the continent after inroads by China and Russia. Biden's pledge comes after he threw his support behind the expansion of the United Nations Security Council, including representation of Africa, during a speech to the world body in September.

https://www.aljazeera.com/news/2022/12/10/biden-to-back-african-union-spot-in-g20-at-us-africa-summit

G20 Sherpa Briefed the Media on the G20 Development Working Group Meeting in Mumbai, Maharashtra from 13-16 December 2022

December 12, 2022

In connection with the first Development Working Group Meeting in Mumbai from 13-16 December 2022, G20 Sherpa Shri Amitabh Kant addressed media persons today and outlined India's DWG G20 priorities and approach. Shri Kant outlined India's DWG priorities as (i) Green Development including climate action and financing, just energy transitions and LiFE (LifeStyle for Environment); (ii) Accelerating implementation of SDGs; and (iii) Digital Public Goods/Data for Development. Shri Kant recalled that a new workstream on Disaster Risk Reduction has been established under India's Presidency to encourage collective work, multi-disciplinary research and exchange of best practices on disaster risk reduction. In addition, a new Startup20 Engagement Group has also been initiated under India's G20 Presidency, recognizing the role of Startups in driving innovation that responds to a rapidly changing global scenario.

https://www.g20.org/en/media-resources/press-releases/december-2022/dwg-1/

Jaishankar Holds Talks on India's G20 Presidency, Ukraine War with UN chief

December 15, 2022

External Affairs Minister S Jaishankar on Wednesday met UN Secretary-General Antonio Guterres to exchange views on working together during India's G20 Presidency. In a Twitter post, the minister said that he valued the UN chief's insights on UNSC reform and the Ukraine conflict. On Wednesday, he chaired the high-level ministerial open debate on the theme of "New Orientation for Reformed Multilateralism". "Chaired the open debate in the Security Council on New Orientation for Reformed Multilateralism. Underlined the three challenges inherent in the IGN process: It is the only one in the United Nations that is conducted without any time frame," the minister said in a tweet. "It is also singular in being negotiated without any text. There is no record keeping that allows progress to be recognized and carried forward," he said in another tweet.

https://www.livemint.com/news/india/jaishankar-holds-talks-on-india-s-g20-presidency-ukraine-war-with-un-chief-11671061291149.html

G20: Joint Finance and Health Task Force Meeting Discussed Bali Leaders' Declaration

December 21, 2022

This was the third meeting of the Finance Track under India's G20 Presidency after the meetings of the Finance Ministers and Central Bank Deputies and Framework Group meeting in Bengaluru last week. In the meeting, discussion was conducted on how finances needed from the Ministry of Health all over the world is going to be coordinated so that health fund can be strengthened and also touched upon the collective approach needed to fight the pandemic. The Task Force is meant to promote collective action and address health emergencies with cross-border impact. In the process, it encourages the effective utilization of resources to tackle the challenges of the pandemic while adopting a One Health approach.

https://newsonair.com/2022/12/21/g20-joint-finance-and-health-task-force-meeting-discussed-bali-leaders-declaration/

India to seek IPR Waiver for Green Energy Tech at G20

December 27, 2022

India is planning to push for a waiver of intellectual property rights (IPR) for technologies related to green energy and energy transition in a bid to bridge the technology gap across G20 countries, two officials aware of the matter said. "We are looking at technology gaps. As long as we don't share the technologies with each other, we will not be able to develop in terms of energy transition. It will take years to achieve transition without technology sharing. We should collaborate and keep aside the limitations of patent rights, copyrights and intellectual property rights (IPR), and work as a team. That is the objective," one of the two officials cited above said. The move comes against the backdrop of countries turning to green energy amid grave supply concerns arising out of the Russia-Ukraine conflict.

About G20 Digest

G20 has emerged as an important global forum over the years, and G20 Leaders' Summits are watched worldwide with interest and suspicion. Successive presidencies of G20 have encapsulated a vast array of issues beyond the financial sector; each having potential impact on trade & investment, global governance and social sector. Each presidency has contributed to the summit process by adding new issues along with the routine ones resulting in a wider and diverse G20 Agenda. In view of the diversity of issues and complex challenges the world is grappling with, the expectations from G20 have multiplied. It is imperative to comprehend and assess the rise of G20, and its role and function in shaping the future global order. In order to motivate and stimulate fresh ideas on G20 and its implications for global economy, RIS brings out the quarterly journal, G20 Digest, as a platform to compare, contrast and create new knowledge that matter for the people in the G20 countries and in the world at large, including the developing and less developed countries.

Guidelines for Submissions

- *G20 Digest* is a peer-reviewed journal dedicated to the issues and subject matters relating to G20 and its broader linkages to global governance, functioning of multilateral institutions, role of emerging markets, and larger development interests of the people.
- Scholarly articles on various topics of interest to G20 are invited from academics, policy makers, diplomats, practitioners and students. The articles may cover the whole range of issues including role and effectiveness of G20, functioning of G20, coverage of sectors, G20 and global governance, G20 and global financial stability, and similar topics.
- Original manuscripts not exceeding 5000 words prepared in MS Word using double space with a 100 word abstract and three key words may be sent to pdash@ris.org.in.
- The submitted articles must follow APA referencing style.
- All numbers below 10 should be spelt out in words such as 'five' 'eight', etc.
- Percentage should be marked as 'per cent', not '%'.
- For numeric expressions, use international units such as 'thousands', 'millions', 'billions', not 'lakh' and 'crore'.
- For time periods, use the format '2000-2008', not '2000-08'.
- Mere submission of an article does not guarantee its publication in the journal.

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