

A Critical Look at Using FinTech Policy to Promote the SDGs

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Abstract

New financial technologies (FinTech) may not represent a new era for sustainable development -- at least not as currently conceived. Many of the gains espoused by the UN and other cheerleaders come from rebranding the online equivalents of traditional savings, investment and tax payment activities. Most of these claims have no supporting evidence, beyond *ad hoc* anecdotes and stories. The existing evidence hardly forms a reliable basis for the very specific technologies and services recommended by the international organizations. We show that abstract and nebulous advice on changing countries' payments, banking, securities, and others' laws helps explain why such advice will likely have little effect on promoting financial inclusion, saving, and mobile payments.

Keywords: financial technology, FinTech, sustainable development, SDGs, financial regulation, financial inclusion.

JEL Codes: O16, O25, K23, G15

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Data Statement: Readers may download our data easily on the popular World DataBank (from the World Bank) public site.

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Introduction

Writing about financial technology (or FinTech) has bewitched policymakers world-wide in recent years.¹ Many particularly argue that FinTech -- as a unbridled public, good and public good -- offers developing countries' policymakers with a way to achieve the United Nation's (UN's) Sustainable Development Goals (SDGs) directly and with little downside.² Others limit their cheerleading to the way FinTech can 'improve' capital markets and especially financial inclusion, thus indirectly encouraging sustainable development.³ Conflating the green and financial inclusion agendas -- these analyses argue for their success long before they know these projects' outcomes.⁴ Others still adopt a very narrow focus -- arguing for a FinTech which promotes savings and access to the financial services typically refused to the poor and marginalized.⁵ FinTech's promise has thus led a wide range of organizations -- from the UN Capital Development Fund to the Alliance for Financial Inclusion -- to urgently push for its adoption in parliaments and on dictators' desks world-wide.

We find, little if any, basis so far for many of the policy recommendations encouraging countries to adopt pro-FinTech policies and laws. The scant number of studies done so far have problems defining FinTech; and anyway fail to find any FinTech-related improvements in sustainable development -- and in particular the SDGs. Any impact will likely exhibit the same U-shaped pattern as other policies and innovations. A little FinTech will probably help, and too much will hurt sustainable development as measured by the SDGs. Internet and mobile phone connections likely foment sustainable development, without relying on FinTech apps to do so. FinTech, though, will likely impact on social and environmental goals (SDGs 11-17) more than economic ones (SDGs 1-10).

Much of the modelling suggests massive FinTech adoption hinders sustainable development -- as resources move from helping the poor to helping more affluent consumers save and buy stuff online more easily. Despite both theoretical and empirical

¹ For an overview of the literature on Fintech, see Franklin Allen, Xian Gu, and Julapa Jagtiani, A Survey of Fintech Research and a Policy Discussion, *Federal Reserve Bank of Philadelphia Working Paper, 20-21*, 2020, available [online](#).

² For one such statement, see Johanna Henrich, FinTech as a Positive Force for Sustainable Development: Financial Services Innovation Brings Huge Potential for Good, *Wirecard Blog*, 2020, available [online](#).

³ See Juan Carlos Castilla-Rubio, Simon Zadek and Nick Robins, FinTech and Sustainable Development: Assessing the Implications, *UNEP Inquiry*, 2016, available [online](#).

⁴ China represents an example of a jurisdiction which policymakers and academics have uncharacteristically exuberantly lauded. See Kate Li and Gong-zhao Wu, Fintech Facilitates the Sustainable Development of Green Finance in China: Cases and Outlook, *Paulson Institute and Tsinghua University Report*, 2020, available [online](#).

⁵ See Ratna Sahay, Ulric Eriksson von Allmen, Amina Lahreche, Purva Khera, Sumiko Ogawa, Majid Bazarbash, and Kimberly Beaton, The Promise of Fintech: Financial Inclusion in the Post COVID-19 Era, *IMF MCMD Working Paper 20/09*, 2020, available [online](#).

arguments against FinTech (as currently conceived) as promoting sustainable development, international organisations of all kinds continue pushing for more legislation and regulation governing the conduct of the same old activities online. We argue that regulators should see positive impacts of existing FinTech technologies, companies and uses before slavishly jumping headlong onto the FinTech bandwagon. Cheery-picked pilot projects do not provide the robust evidence needed to rewrite swathes of existing payments, banking and financial law.

We organize our paper as follows. The first section looks at the skimpy evidence for FinTech affecting the SDGs. We find contradictory, poorly constructed and exaggerated empirical and econometric studies. The second section presents our model and empirical approach toward estimating the impacts of FinTech on countries' SDG scores. We look at a proxy for financial regulation -- finding the ways such regulation would impact on two 'tacit' (or underlying) factors driving the 17 SDGs. This model uses modern data mining techniques like principle components analysis and clustering on actual SDG data (not proxies) to offer deep insights into the ways future researchers could analyse our question. The third part of our paper provides examples of recent FinTech advice proffered by several prominent international organizations. We show that the abstractness of such advice makes its effectiveness highly suspect. Much of this advice simply renames traditional banking, governmental and consumer activity increasing done online. New pieces of FinTech-related legislation around the world start with the assumption that FinTech promotes sustainable development -- without providing any evidence. Such an approach lays a fallow ground for FinTech law.

Our approach suffers from a number of weaknesses which we acknowledge at the start. First, we do not trace the effects of particular FinTech regulation on any particular SDG in any particular place. Travel restrictions related to COVID-19 and the cost of pursuing such a tack makes such an ideal approach impossible now. Second, we try to guess how the tree of sustainable development will look from the seedlings of geometric growth in FinTech rulemaking. We simply have too little data to make firm conclusions. We argue that others do too. Third, we cover complex econometric and modelling techniques in a cursory manner. We can only defend this approach by citing the old aphorism that readership halves with every equation in a paper. We take the cowardly position that we have too little evidence to start regulating FinTech. Hopefully, our study lays the groundwork for later, less banal results.

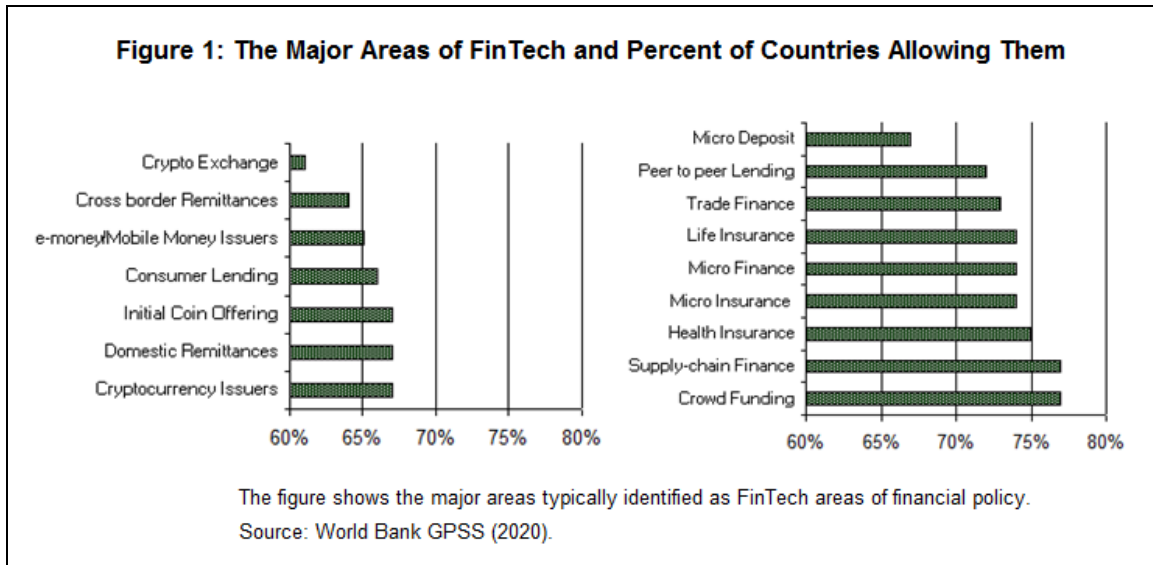
Will FinTech Likely Promote Sustainable Development?

FinTech refers to the use of digital technologies to improve financial service offerings (by lowering transaction costs, disintermediating value chains in financial intermediation and so forth) by financial service providers.⁶ Numerous authors have claimed that FinTech represents a new, bold way of offering financial services.⁷ Yet, as far as most

⁶ See Anjan Thakor, Fintech and Banking: What Do We Know? *Journal of Financial Intermediation* 41, 2020, available [online](#).

⁷ The FinTech 'self-help' industry has blossomed in the prior five-ish years. For one example, see Peter Gomber, Robert Kauffman, Chris Parker and Bruce Weber, On the Fintech Revolution: Interpreting the

policy treatments go, FinTech consists of the areas shown in Figure 1. The figure shows the percent of countries allowing various aspects of ‘FinTech’ (as the survey and respondents themselves defined it). From crowdfunding to e-money, we see areas that will likely represent FinTech offerings for the foreseeable future.



The major FinTech areas -- if Figure 1 predicts the future -- will revolve around crowdfunding, supply-chain and trade finance, as well as health and other insurance. In 2020, much of the media’s attention has focused on cryptocurrency issuers and mobile money.⁸ Yet, any assessment of FinTech’s impact on the SDGs should look at *how* they affect development -- not *what* they use to affect such development. The unit of account, medium of exchange and store of value matter less than the institutional arrangements used for saving, investing and transacting. Simply put, we don’t care whether transactors use mobile minutes, Dogecoin, or Ethereum. We only care how FinTech services affect the supply and demand of real public and private goods and services.⁹

Mobilizing Savings Through Financial Inclusion and New Credit

Forces of Innovation, Disruption, and Transformation in Financial Services, *Journal of Management Information Systems* 35(1), 2018, available [online](#).

⁸ Figure 1 seems to confirm these trends. We do not have space to discuss the nuances of online payment methods and media. See Olusegun Vincent and Olaniyi Evans, Can Cryptocurrency, Mobile Phones, and Internet Herald Sustainable Financial Sector Development in Emerging Markets? *Journal of Transnational Management* 24(3), 2019, available [online](#).

⁹ For example, Agarwal and co-authors looked at how ATMs affected consumers’ buying behaviour, making withdrawing money easier. They did not look at how ATM users used bills dispensed by ATMs differently from those obtained from other sources. See Sumit Agarwal, Wenlan Qian, Yuan Ren, Hsin-Tien Tsai, and Bernard Yin Yeung. The Real Impact of FinTech: Evidence from Mobile Payment Technology, *SSRN Working Paper 3556340*, 2020, available [online](#).

FinTech innovations -- if anything -- seem to succeed in mobilizing savings. In both market cap and revenue terms, FinTech start-ups and ventures by technology and financial companies alike have increased over the past 3-5 years.¹⁰ Figure 2 shows the share price of a well-known index -- the Stoxx Global Fintech Index. The Index shows indirectly only some of the money available to FinTechs through their market capitalization/valuation. Naturally, the more money available for FinTech ventures, the more financial inclusion -- and thus sustainable development?

Figure 2: Investors in One Global FinTech Index Would Have Tripled Their Investment in 5 years



Source: [Stoxx.com](https://www.stoxx.com)

The data though do not bear out this self-evidence truth. One of the most cited statements of financial inclusion and poverty (Suri and Jack, 2016) has serious problems.¹¹ Citing their study of M-Pesa users in Kenya, the Bill and Melinda Gates Foundation had extrapolated its results to the entire Kenyan population by 2019.¹² The attrition rate for the study of “over 35%” and the measurement of *access* (which we typically think of as use) to mobile money by measuring “the geographic proximity of households to M-PESA agents” (underlining ours) represents only a few of the study’s weaknesses. In other words, if you are close to an agent, you have access -- whether you could actually contact that person or not. Only after we scanned the literature did we find a range of papers exposing problems with the study.¹³ **Such honest and direct peer-reviewed studies represent an exception to a literature full of paid cheerleaders.**

A plethora of studies look at how FinTech helps promote financial inclusion -- which is assumed to promote sustainable development. These authors only want to show how

¹⁰ For a more precise quantification, see Stijn Claessens, Jon Frost, Grant Turner, Feng Zhu, Fintech Credit Markets Around the World: Size, Drivers and Policy Issues, *BIS Quarterly Review* September, 2018, available [online](#).

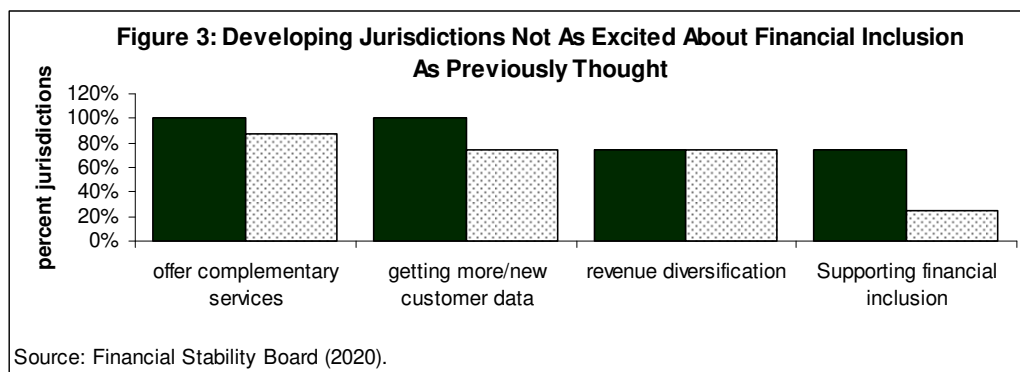
¹¹ Tavneet Suri and William Jack, The Long-Run Poverty and Gender Impacts of Mobile Money, *Science* 354(631): 1288-1292, available [online](#).

¹² The paper has been cited by the Bill and Melinda Gates Foundation for its work as well as countless other organizations. For example, see Inclusive Digital Financial Services A Reference Guide For Regulators, 2019, p. 11, available [online](#).

¹³ For example, see Milford Bateman, Maren Duvendack and Nicholas Loubere, Is Fin-Tech the New Panacea for Poverty Alleviation and Local Development? Contesting Suri and Jack’s M-Pesa Findings Published in Science, *Review of African Political Economy* 46(161), 2019, 480-495.

FinTech can promote a financial inclusion which causes financial sectors to grow and mature. Inclusion which substitutes for existing financial services suppliers and users remains completely ignored. Vincent and Evans for example, kind of show such a result.¹⁴ Jagtiani and Lemieux may find that FinTech platforms like the US's LendingClub may lend in underserved markets.¹⁵ But we do not know if these loans actually make money -- namely finance productive investment -- rather than unsustainable consumption.

Authors and policymakers of all kinds answer disingenuously when they say that lower income countries want to use FinTech to increase financial inclusion. In surveys done by the Financial Stability Board, as shown in Figure 3 they want to do *everything!*¹⁶ Namely, when asked if complementing core commercial activities and access new sources of data were 'important motivations' -- 100% of respondents from these lower middle income countries responded with the equivalent of 'yes please.' Indeed, one can express surprise not at the support for inclusion, but lack of such support in particular jurisdictions.



As more data emerge about e-money and FinTech, researchers still have difficulty showing a link with any kind of development. Indeed, as Figure 4 shows, the uptake of e-money -- one important area for FinTech -- remained stagnant throughout the 2010s.¹⁷ Stepping back and thinking about Figure 5, very few channels exist through which FinTech might affect anything on the SDG list. Renewable peer-to-peer energy generation does little to link FinTech with the SDGs. A collateral e-registry does little to generate more value than a traditional register. How can one 'save for biodiversity'? Cheerleaders flood the literature with abstract tables promising to mobilize savings for development. Yet, these tables remain wish lists (as we detail later).

¹⁴ We say 'kind of' because of the problems with their econometric methods. See Olusegun Vincent and Olaniyi Evans, Can Cryptocurrency, Mobile Phones, and Internet Herald Sustainable Financial Sector Development in Emerging Markets? *Journal of Transnational Management* 24(3), 2019, 259-279, available [online](#).

¹⁵ Julapa Jagtiani and Catharine Lemieux, Do Fintech Lenders Penetrate Areas That Are Underserved By Traditional Banks? *Journal of Economics and Business* 100, 2018, 43-54, available [online](#).

¹⁶ Financial Stability Board, Big Tech Firms in Finance in Emerging Market and Developing Economies Market Developments and Potential Financial Stability Implications, at Graph 4, 2020, available [online](#).

¹⁷ For the country of your choice, see World Bank, Global Payment System Survey 2015, 2015, available [online](#).

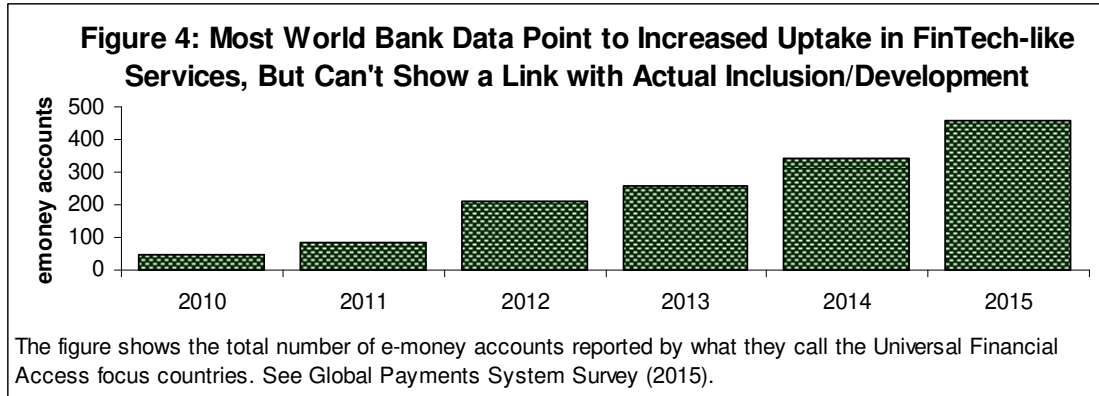


Figure 5: Almost Nothing in the FT4SD Effectively Mobilizes Savings

SME collateral management registry	smallholder identity and land registry	renewable energy P2P	financial markets early warning system	basin water rights management
Welfare conditional transfer	participative democracy 2.0	smallholder extension services	sustainable fintech regulatory sandbox	agricultural credit risk management
remittances/ accounts for unbanked	Enabling microfinance 2.0	community distributed generation	Biodiversity conservation exchange	water asset registry and ratings
economic identities for refugees	pay as you go resource utilities	SME asset trade finance	shared asset insurance	fish supply chain traceability
international aid smart contract	flexible energy supply and demand	SME smart assets	smallholder index insurance 2.0	climate monitoring reporting verification.

The figure shows ways in which the authors claim FinTech (or at least finance for sustainable development) helps mobilize the savings necessary to fund spending on achieving the SDGs.
Source: Castilla-Rubio *et al.*, *supra* note 3, 2016.

Several authors look at the way FinTech - or at least financial inclusion -- affects a part of the SDGs (GDP growth). These studies confine themselves mostly to looking at the effect of the **banking/financial sector** on growth, rather than looking at any SDG impacts directly. For example, Sahay *et al.* (2015), using regression analysis, find that financial inclusion promotes GDP growth -- though only up to a point.¹⁸ In other studies, he and other colleagues fail to find any link between financial inclusion and GDP growth.¹⁹ The Oxford Economics ‘Yes’ study uses linear regression in similarly irresponsible ways - regressing output on education, the number of depositors and trade.²⁰ Vincent and Evans may find that mobile and internet adoption “herald” financial inclusion -- though they can make no claims on whether such inclusion itself promotes the welfare of those with

¹⁸ Ratna Sahay, Martin Cihák, Papa N’Diaye, Adolfo Barajas, Srobona Mitra, Annette Kyobe, Yen Nian Mooi, and Seyed Reza Yousefi, Financial Inclusion: Can It Meet Multiple Macroeconomic Goals? *IMF Staff Discussion Note 15/17*, 2015, available [online](#).

¹⁹ Namely, regression coefficients on the relevant variable flip between statistical significance, and insignificance -- depending on which other variables appear in the regression. Sahay *et al.*, *supra* note 5, at Annex 4, available [online](#).

²⁰ Oxford Economics, The ‘Yes’ Economy: Giving the World Financial Identity, 2019, available [online](#).

internet access.²¹ We simply do not know whether financial inclusion helps people live better -- never mind if FinTech plays any part of that better life.

Perhaps the sector in which FinTech's use in mobilizing savings has been most touted provides hints about the links between FinTech and the SDGs? Let's look at FinTech-related 'green finance' and see if it shows us something more general about FinTech-SDG linkages.

A New Green Finance Revolution?

"Green finance" represents one of the areas where many authors have signalled the greatest interest in FinTech as a means of promoting some aspect of sustainable development.²² In such green finance, some or all of the funds raised from investors through offerings like green bonds serve some environmental purpose.²³ By directly financing environmental programmes and cleaner technologies, green finance hopes to promote the environmental planks of the SDG goals.²⁴ Such finance might also help overcome the many problems with the way the SDGs treat environmental issues.²⁵ FinTech's proponents seem bent on selling FinTech as green finance's panacea. Accordingly, FinTech can help with the monitoring of green finance-related laws and contractual covenants -- which thereby promote the SDGs.²⁶ Authors like Chiesa and

²¹ Olusegun Vincent and Olaniyi Evans, Can Cryptocurrency, Mobile Phones, and Internet Herald Sustainable Financial Sector Development in Emerging Markets?, *Journal of Transnational Management* 24(3), 2019, available [online](#).

²² All seventeen (17) SDG goals rely on environmental protection to some degree. Or Zeng and his co-authors argue, they seek "to reconcile environmental protection with socioeconomic development." Seven (7) focus directly on the protecting life on land, below the water, and so forth. See Yi-wen Zeng, Sean Maxwell, Rebecca Runting, Oscar Venter, James Watson and Roman Carrasco, Environmental Destruction Not Avoided with the Sustainable Development Goals, *Nature Sustainability* 3: 795-798, 2020, available [online](#).

²³ Besides finding no significant premiums paid by green bonds, Tang and Zhang also provide an excellent review of these bonds and their growth in debt markets. See Yong-jun Tang and Yupu Zhang, Do Shareholders Benefit from Green Bonds? *Journal of Corporate Finance* 61, 2020, available [online](#).

²⁴ The Paris Agreement -- rather than pure altruism or even self-interested higher returns accruing to sustainable investment -- have led to much of such green investment. See Clarence Tolliver, Alexander Keeley, and Shunsuke Managi, Drivers of Green Bond Market Growth: The Importance of Nationally Determined Contributions to the Paris Agreement and Implications for Sustainability, *Journal of Cleaner Production* 244, 2020, available [online](#).

²⁵ A chorus of authors have critiqued the SDGs' treatment of, and effectiveness of, protecting the environment. If Diaz-Sarachaga and co-authors bemoan the measurability and lack of SDG data, authors like Filho *et al.* worry that many of the issues raised by the SDGs remain under-researched. See Jose Diaz-Sarachaga, Daniel Jato-Espino and Daniel Castro-Fresno, Is the Sustainable Development Goals (SDG) Index an Adequate Framework to Measure the Progress of the 2030 Agenda? *Sustainable Development* 26(6): 663-671, 2018, available [online](#). See also Walter Filho, Ulisses Azeiteiro, Fatima Alves, Paul Pace, Mark Mifsud, and Luciana Brandli, Reinvigorating the Sustainable Development Research Agenda: The Role of the Sustainable Development Goals (SDG), *International Journal of Sustainable Development & World Ecology* 25(2): 131-142, 2018, available [online](#).

²⁶ See Xiao-Chen Zhang, Matias Aranguiz, Duo-Qi Xu, Xing Zhang, Xin-Ran Xu, Chapter 21 - Utilizing Blockchain for Better Enforcement of Green Finance Law and Regulations, *In Alastair Marke, Transforming Climate Finance and Green Investment with Blockchains*, 2018: 289-301, available [online](#).

Barua simply assert that ‘impact investing’ will help improve SDG scores -- even though their study does not look directly at the issue.²⁷

The green finance literature propounds mixed messages about such finance’s impacts on environmental outcomes like pollution and climate change. Depending on the econometric technique chosen, Nawaz and co-authors find very different effects for green finance on climate change in countries which they select for study.²⁸ In their study of FinTech on pollution, Jiang *et al.* find the likely U-curve which underlies all FinTech finance and its effect on sustainable development.²⁹ Namely, if FinTech finance from very low levels helps firms control pollution -- excessive amounts of FinTech finance encourages overproduction and thus pollution.³⁰ Hinson *et al.* (2019) at least sends an honest message -- that we do not know the effect FinTech will have on the SDGs; and more research is needed.³¹

What about the investors themselves? No profit incentive - no investment. Most of these studies find either no premium attached to green finance or bonds with heavily-marketed environment aspects...or they show declines in yields over time.³² Authors like Li *et al.* can not say whether Chinese companies with active corporate social responsibility (CSR) programmes offering green bonds and investments experience lower financing costs because of market demand, or from extensive government support.³³ Despite support from financial institutions, governments and academics alike -- the empirical evidence does not yet support the case for investing in green bonds. Current research shows that green FinTech offers a poor hedge against market risk -- making the ‘sustainable’ part of

²⁷ See M. Chiesa and S. Barua, The Surge of Impact Borrowing: The Magnitude and Determinants of Green Bond Supply and Its Heterogeneity Across Markets, *Journal of Sustainable Finance & Investment* 9(2): 138-161, 2019, available [online](#).

²⁸ Muhammad Nawaz, Usha Seshadri, Pranav Kumar, Ramaisa Aqdas, Ataul Patwary and Madiha Riaz, [The] Nexus Between Green Finance and Climate Change Mitigation in N-11 and BRICS Countries: Empirical Estimation Through [the] Difference in Differences (DID) Approach, *Environmental Science and Pollution Research*, 2020, available [online](#).

²⁹ Song Jiang, Shuang Qiu, Hong Zhou, and Mei-lan Chen, Can FinTech Development Curb Agricultural Nonpoint Source Pollution? *International Journal of Environmental Research and Public Health* 16(22), 2019, available [online](#).

³⁰ The laws of diminishing returns almost guarantee we should expect U-curves for finance and almost any outcome. We will see many of them throughout our paper.

³¹ Robert Hinson, Robert Lensink, Annika Mueller, Transforming Agribusiness in Developing countries: SDGs and the Role of FinTech, *Current Opinion in Environmental Sustainability* 41, 2019, 1-9, available [online](#).

³² Without any corroboration from market participants themselves, Zerbib still claims that these lower yields “should not be a disincentive to keep on investing in green bonds.” Olivier Zerbib, The Effect of Pro-Environmental Preferences on Bond Prices: Evidence from Green Bonds, *Journal of Banking & Finance* 98: 39-60, 2019, available [online](#).

³³ Zhi-Yong Li, Ying Tang, Jing-Ya Wu, Jun-Feng Zhang and Qi Lu, The Interest Costs of Green Bonds: Credit Ratings, Corporate Social Responsibility, and Certification, *Emerging Markets Finance and Trade* 56(12), 2020, available [online](#).

such finance highly questionable.³⁴ Such a hedge particularly fails during bear markets -- and may contribute to systemic risk.³⁵

Many studies clearly represent self-serving attempts to use pseudoscience to establish a **false link** between FinTech and SDGs. Alipay's Ant Forest has game players simulate planting trees in a mobile game, where they 'learn' to reduce their CO2 emissions.³⁶ AliPay gives a helping hand, in that, "users plant and nurture a virtual tree with earned green points, which Ant Financial will then plant in real life. In the last three years AliPay Ant Forest has been online, it has attracted over 550 million users, roughly around 7% of the world's population" (underlining ours).³⁷ If intentions were horses... and users could plant far more trees by themselves directly. Moreover, such a number defies common sense, and statements like "Alipay Ant Forest's platform could be the first step towards individual carbon accounting" cite non-existent references.³⁸ The authors estimate an 8.4 million tonne reduction in CO2 emissions by 2030, including a 4.5% reduction in countries where AliPay does not have many users, like the US and India.³⁹

If anything, blockchain technology has allowed for the greatest benefits. Studies like Yun and Wei find a positive effect for blockchain adoption and the availability of 'green' credit.⁴⁰ Nassiry shows how the application of blockchain technology can reduce costs and increase incentives to provide funds for specific cases of renewable energies, decentralized electricity and carbon credit markets, as well as climate finance (like green bonds).⁴¹ Blockchain technologies disintermediate the need for securities wholesalers, auditors and others. Blockchains and other distributed ledger technologies do not quite represent a new way of funding environmentally sensitive investments.⁴² But they represent a way of lowering their cost and in helping to report benefits back to the UN.⁴³

³⁴ See Tn-Lan Le, Emmanuel Abakah, Aviral Tiwari, Time and Frequency Domain Connectedness and Spill-Over among Fintech, Green Bonds and Cryptocurrencies in the Age of the Fourth Industrial Revolution, *Technological Forecasting and Social Change* 162(2), 2021, available [online](#).

³⁵ For proof, see Jian-Ping Li, Jing-Yu Li, Xiao-Qian Zhu, Yin-Hong Yao, and Barbara Casu, Risk Spillovers Between FinTech and Traditional Financial Institutions: Evidence from the U.S., *International Review of Financial Analysis* 71, 2020, available [online](#).

³⁶ Data-Pop Alliance, Green Digital Finance Alliance and UNEP Inquiry, *Digital Technology Shaping Green and Sustainable Lifestyle: Exploring Alipay Ant Forest*, 2020, available [online](#).

³⁷ *Id.* at p. 6.

³⁸ *Id.*

³⁹ Indeed, they predict India will account for almost 75% of all emissions reduced as a result of the game. See *Id.*, at Figure 4.

⁴⁰ Zhang Yun and Wei Wei, Does Blockchain Technology Promote the Development of Green Finance? -- Evidence from China, *Advances in Economics, Business and Management Research* 118, available [online](#).

⁴¹ See Darius Nassiry, The Role of Fintech in Unlocking Green Finance: Policy Insights for Developing Countries. *ADB Working Paper* 883, 2019, available [online](#).

⁴² People from literally everywhere can think up their own 'securities' for common folk to put money into. Translating the policy-speak into simple English makes green investment look far less revolutionary than one might think. See Marco Schletz, Darius Nassiry, and Myung-Kyoon Lee, Blockchain and Tokenized Securities: The Potential for Green Finance, *Asian Development Bank Institute Working Paper* 1079, 2020, available [online](#).

⁴³ We still don't know what they will report back to the UN, as some authors call for SDG Acceleration Scorecards. Even a quick glance at these scorecards shows they do not even include those indicators agreed among the 17 major SDG goals. See Ahmet Aysan, Fouad Bergigui and Mustafa Disli, Using Blockchain-

Past Studies of FinTech and SDGs Broadly Defined

Specific industry/company studies have made some strides in trying to link FinTech to the SDGs. The Global System for Mobile Communications Association (GSMA) impact study covers all the SDG goals - but focuses more on access to telephony than financial technology.⁴⁴ The self-proclaimed interest group's study gloats mobile telephony is "achieving 48% of its potential contribution to the SDGs - up from 33% in 2015."⁴⁵ They do not say how they define these goals operationally. The Association claims a, "result of an additional 610 million individuals using mobile[s] to access educational information for themselves or their children in 2019."⁴⁶ Yet, they are neither responsible for this content, nor for guiding users/consumers to such content. Their metrics consist of mapping 8 measures of mobile phone and other telephony usage onto the SDGs (namely coverage, network performance, adoption, affordability, usage, and internet-of-things connections, e-waste and operating responsibility).⁴⁷ Such an attempt is laudable in spirit. Yet, even common sense might find the linkages between something like network performance and gender equality tenuous. The lack of independent oversight over the report -- or any independent review -- makes these results cagey.

Big data studies always assume that more formal system banking -- with 'formal' now including online banking -- leads to more SDG-style development. The most recent Findex report regales the reader with data about access to bank accounts and so forth.⁴⁸ Yet, nowhere in the report do the authors actually show/prove that more financial inclusion leads to more development. Their primary evidence consists of references to the flawed Jack and Suri study we previously dissected.⁴⁹

Several studies use multiple regression techniques to look at the way FinTech might affect the SDGs. In one study looking at Ghana, wider mobile phone use and financial inclusion "significantly reduce[s] the probability of a household becoming poor."⁵⁰ In probably the best study to date, Deng *et al.* look at a composite of FinTech and the SDGs.⁵¹ Figure 6 summarizes their results. They find a non-linear relationship between the number of FinTech platforms operating in China, and a statistically created measure of sustainable development. In all likelihood, **any good study looking at the relationship between FinTech and the SDGs should find a non-linear, U-shaped relationship between these variables.**

Enabled Solutions as SDG Accelerators in the International Development Space, *Sustainability* 13(7), 2021, available [online](#).

⁴⁴ GSMA, 2020 Mobile Industry Impact Report: Sustainable Development Goals, 2020, available [online](#).

⁴⁵ *Id.* at p. 9.

⁴⁶ *Id.* p. 10.

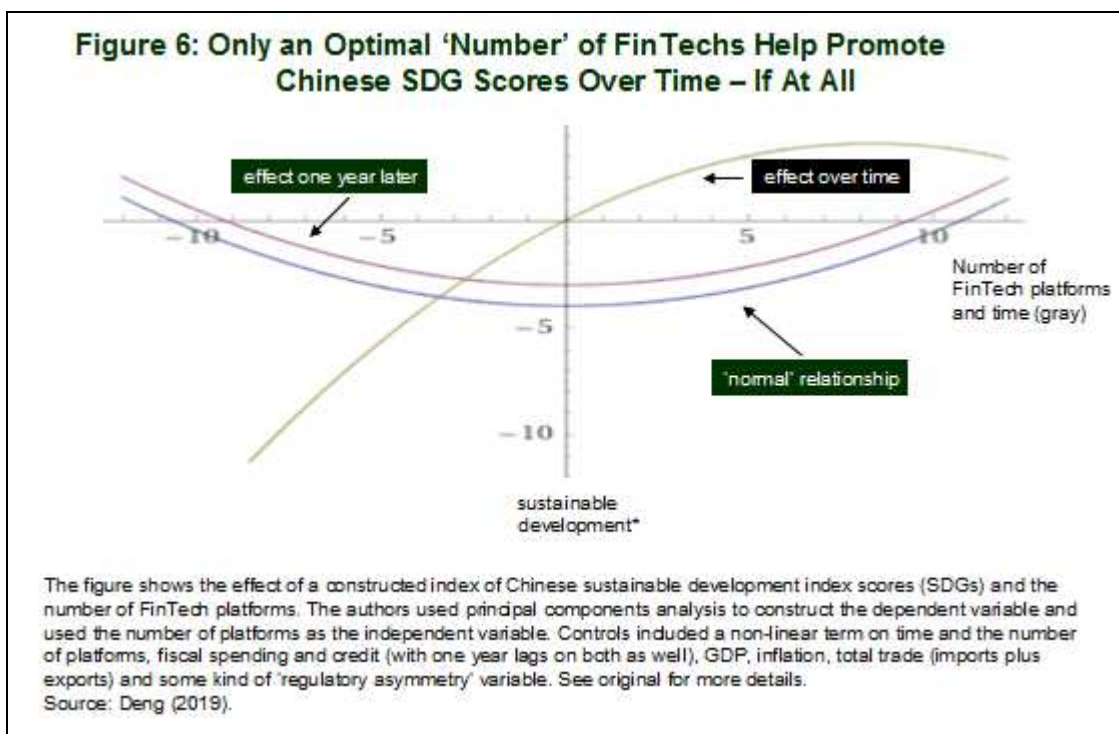
⁴⁷ *Id.* at Methodology.

⁴⁸ Asli Demirgüç-Kunt, Leora Klapper, Dorothe Singer, Saniya Ansar, Jake Hess, The Global Findex Database Measuring Financial Inclusion and the Fintech Revolution, 2017, available [online](#).

⁴⁹ See *Id.*, at p. 1.

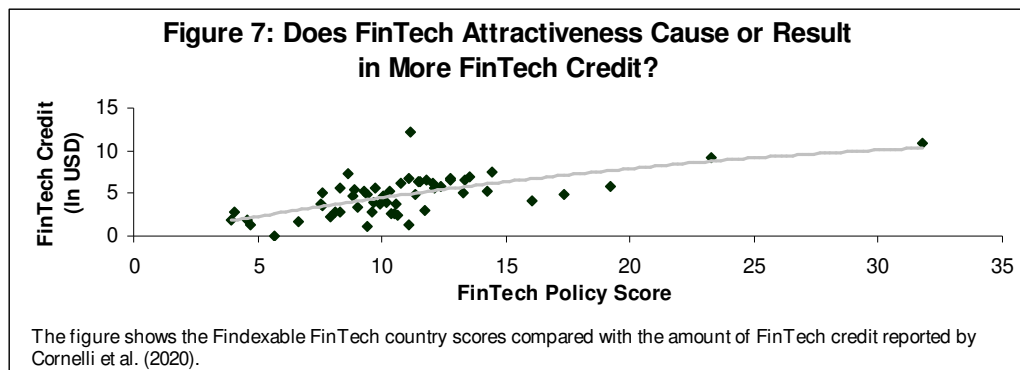
⁵⁰ See Joshua Yindenaba Abor, Mohammed Amidu and Haruna Issahaku, Mobile Telephony, Financial Inclusion and Inclusive Growth, *Journal of African Business* 19(3), 2018, available [online](#).

⁵¹ Xiang Deng, Zhi Huang and Xiang Cheng, FinTech and Sustainable Development: Evidence from China Based on P2P Data, *Sustainability* 11(22), 2019, 6434.



In the middle of these studies lie those that seek to use FinTech to bolster existing policies and institutions. An obvious approach consists of using the traceability of FinTech related services and online monetary surrogates to force more people to pay more tax.⁵² Such euphoric visions of FinTech see non-compliance with tax law as simple cheating by bad citizens -- ignoring the real and often justified reasons for such non-payment (such as having tax monies stolen or misused by senior politicians). FinTech obviously has the potential of encouraging better law -- even in traditional banking sectors. Figure 7 shows a simple correlation between a measure of FinTech policy and credit going to FinTechs. An unmistakable positive relationship clearly exists -- though we can not be sure if supply or demand factors push such developments. For this, we need rigorous modelling.

⁵² For example, see Jon Truby, Financing and Self-Financing of SDGs through Financial Technology, Legal, and Fiscal Tools, In Julia Walker, Alma Pekmezovic and Gordon Walker, *Sustainable Development Goals: Harnessing Business to Achieve the SDGs through Finance, Technology, and Law Reform*, 2019, available [online](#).



The Impact of Advice on Changing Countries' FinTech-Related Law

A Flawed Path to Policy

Despite having no data on the likely effects of FinTech on the SDGs, experts have confidently proclaimed that financial law and practice needs to change. A UN Task Force has groups the SDGs into the usual economic, social and environmental buckets, providing options for their finance as in Figure 8.⁵³ None of these ideas have been successfully piloted. The Universal Financial Access initiative wants everyone to have access to an account - but few data show that such inclusion leads to sustainable development *à la* the SDGs.⁵⁴ Arab policymakers assuredly claim that, “dedicated [FinTech] strategies and actions plans, can promote competition and inclusion in a digital financial system.”⁵⁵ They provide no proof.

Figure 8: FinTech Services Affecting the Disintermediation of Economic, Environmental and Social Institutions

Type	Economic	Environmental	Social
Cheaper Intermediation and Aggregation	Mass market digital finance	Digital exchanges for carbon credits/bio-diversity offsets	Remittances and humanitarian transfers
	Pay-as-you-go utility financing models digitalized value chain/trade finance fair trade, ethical, sustainable, ecommerce and digital marketplaces	Platforms for climate project financing Aggregation/ securitization of assets Green banking products	Digital marketplaces and ecommerce platforms Mass-market digital finance Digital education and health care financing schemes
Disintermediation and New Business Models	Crowdfunding and P2P lending Gamified 'green' consumption	E-trading of natural capital backed digital assets Remote verification insurance and financing	e-government services Gender-lens crowdfunding & investing robo-advisors Bias detection algorithms
	Circular economy models	Gamified sustainable	Robotized m-education and m-

⁵³ Simon Zadek, Vera Bersudskaya, Duygu Celik, Maya Forstater, Mimo He, Aiaze Mitha, and Arti Singh, *People's Money: Harnessing Digitalization to Finance a Sustainable Future*, UN Task Force Digital Financing of the Sustainable Development Goals, 2020, available [online](#). See also Castilla-Rubio, 2016, at *supra* note 3.

⁵⁴ See World Bank, *Universal Financial Access 2020 Overview: Universal Financial Access by 2020*, 2018, available [online](#).

⁵⁵ Secretariat of the Financial Inclusion for the Arab Region Initiative, *Approach for Digital Financial Transformation in the Arab Region*, 2020, at sec. 3.2.i, available [online](#).

	Fractional asset ownership Digital currency-based project finance and community services AI-enhanced tax optimization	behaviours Sustainability robo-advisors	health Digital micro-insurance Participatory budgeting
FinTech Services and Applications Promoted by the UN (by type of stakeholder)			
Buyers	supply chain tracing	carbon footprint tracking	digital payments, sharing economy
savers	mobile wallets,	data driven insurance	digital group saving gamified saving apps,
tax payers	government payment solutions,	open government data	digital public procurement,
Givers	direct giving	crowdfunding,	digital remittance
Lenders	debt crowdfunding	P2P microlending,	
Borrowers	layaway asset lending,	PAYG,	rent-to-own, algorithmic loading (lending?)
Investors	robo advisors	retail green/blue securities,	impact investing platforms fractional asset ownership.

Source: Zadek and co-authors (2020) and Castilla-Rubio and colleagues (2016).

Replacing taxes with FinTech-related fees for public services represents a particularly troubling area requiring more thought. The UN report cited above specifically mentions M-Akiba, which is a “retail bond...dedicated to infrastructural development projects, both new and on-going”⁵⁶ Yet, taxes already supposedly fund such projects. So, at the very least, M-Akiba simply substitutes forms of revenue generation, which citizens should be participating in and overseeing, with an opaque one that concentrates the benefits in the hands of the companies’ equity holders. They call the blockchain tracing of taxes to development projects as the ‘pathfinder concept.’⁵⁷ Such a pathfinder concept would not be needed if governments reported their expenditure fully and correctly. So why would we expect governments to disclose expenditures accurately in a FinTech scheme, when they have not done so in the past?

Existing policy advice also ignores existing financial sectors -- which could likely do the same activities -- without costly disruptions to their entire financial systems. Take Zimbabwe’s Growth Enterprises Market SME listing platform.⁵⁸ The platform promises to use past purchase data to assess companies’ creditworthiness -- something they should have already been doing with tighter relationships and under existing disclosure rules.

These recommendations also ignore the politics responsible for underdeveloped financial sectors in the first place. Digitalized data, supported by increasingly complex machine-driven analytics should incorporate sustainability considerations.⁵⁹ Yet, confidentiality serves many people’s interests. No amount of digitization will make such disclosure profitable without deep-seated political reform.⁶⁰

⁵⁶ Zadek *et al.*, *supra* note 80, at p. 53.

⁵⁷ *Id.* at p. 52.

⁵⁸ *Id.* at p. 54

⁵⁹ *Id.* at p. 56.

⁶⁰ The literature in the early 2000s argued passionately for more transparency in government expenditure and accounting. By the 2010s, academics and government officials realized transparency in itself was not

A wide number of international organizations have -- without any data whatsoever -- developed models and frameworks for understanding how FinTech can improve consumers' and citizens' lives. The World Bank encourages the following litany of activities: application programming interfaces (APIs), big data analytics, biometric technologies, cloud computing, contactless technologies, digital identification, distributed ledger technology, the internet of things, instant payments, central bank digital currencies, stablecoins, electronic wallets and open banking (among others).⁶¹ Authors at the Arab Monetary Fund have shaped this into the *PAFI Wheel*.⁶² The wheel includes everything but the kitchen sink, and the Bank for International Settlements (BIS) encourages other countries to follow suit with their questionnaires and "application tools."⁶³ The Sustainable Banking Network has their *ad hoc* evaluation of IDA countries' adoption of sustainable finance principles.⁶⁴

The G20's cooperation with the Global Partnership for Financial Inclusion provides 8 principles that read like...principles. The vaguest language and the usual jargon admonishes policymakers to "provide an enabling and proportionate legal and regulatory framework for digital financial inclusion" (from principle 3) and "expand the digital financial services ecosystem—including financial and information and communications technology infrastructure" (from Principle 4)." These examples show just how words tend to get recycled in the advice business.⁶⁵

The Global Financial Innovation Network's attempt to build a global (or at least cross-border) sandbox failed in 2019 due to lack of interest on firms' side and due to the regulatory mismatches the Network sought to avoid.⁶⁶ The Alliance for Inclusion's *Sochi Accord* lists 10 of the vaguest principles -- most of which revolve around sharing FinTech related information.⁶⁷

Not to be outdone, the UNDP and the OECD have announced their own *Framework for SDG Aligned Finance* -- which fails to explain why existing/previous measures do not

enough. Accountability required robust rules promoting legal and political accountability. See Can Chen and Sukumar Ganapati, Do Transparency Mechanisms Reduce Government Corruption? A Meta-Analysis, *International Review of Administrative Sciences*, 2021, available [online](#).

⁶¹ CPMI-World Bank Group PAFI Task Force, Payment Aspects of Financial Inclusion in the Fintech Era, 2020, available [online](#).

⁶² See Secretariat of the Financial Inclusion for the Arab Region Initiative, Approach for Digital Financial Transformation in the Arab Region, 2020, available [online](#).

⁶³ BIS Committee on Payments and Market Infrastructures and the World Bank Group, Payment Aspects of Financial Inclusion: Application Tools, 2020, available [online](#).

⁶⁴ The countries assessed include: Bangladesh, Cambodia, Ghana, Honduras, Kenya, Kyrgyzstan, Laos, Mongolia, Nepal, Nigeria, and Pakistan. See Sustainable Banking Network, Necessary Ambition: How Low-Income Countries Are Adopting Sustainable Finance to Address Poverty, Climate Change, and Other Urgent Challenges, 2020, p. 6, available [online](#).

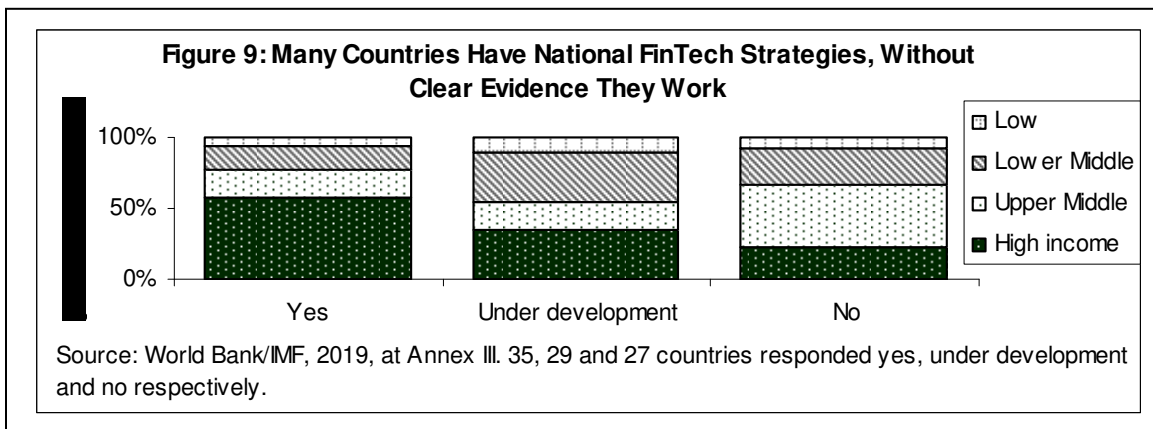
⁶⁵ Global Partnership for Financial Inclusion, G20 High-Level Principles for Digital Financial Inclusion, 2020, at p. 1, available [online](#).

⁶⁶ Global Financial Innovation Network, Cross-Border Testing: Lessons Learned, 2020, available [online](#).

⁶⁷ The Sochi Accord builds off of work on the Maya Declaration, a set of targets for financial inclusion. See 2018 Maya Declaration Progress Report: Today's Targets, Tomorrow's Impact, 2019, available [online](#).

suffice.⁶⁸ Rather than use hard law instruments, like their public procurement rules, they have again moved forward with non-binding recommendations and principles.⁶⁹ The Inter-American Development Bank -- for its part -- talks up the *Green Bond Principles* and the *Climate Bond Initiative*, vowing to transform green bond markets in the Western hemisphere.⁷⁰

Based on this, countries have adopted their own FinTech policies and laws. Figure 9 shows that high-income countries unsurprisingly have these policies -- or are developing them.⁷¹ Yet, few low income countries specifically note they do not have them. And why should they? As Figure 10 shows, low income countries need to (and are) working on basic financial sector building in areas like stability and anti-money laundering. They can't possibly know if FinTech-related advice works...because they are so far from adopting it. Even the World Bank errors in its own report by noting that the, "Africa Sub-Saharan region has become a leader in mobile money," a claim that strains at credulity.⁷² The need for empirically-based policy has never been clearer.



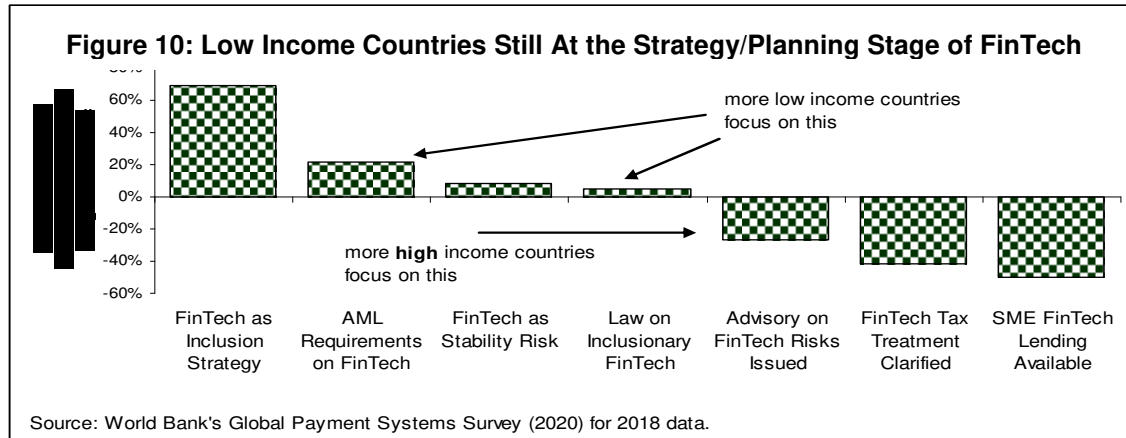
⁶⁸ OECD and UNDP, Framework for SDG Aligned Finance, 2020, available [online](#).

⁶⁹ The donors have harmonized much of their procurement law in the dealing with investment. See Procurement Regulations for IPF Borrowers, Procurement in Investment Project Financing, 2018, available [online](#).

⁷⁰ See Juan Ketterer, Gabriela Andrade, Maria Netto, and Maria Haro, Transforming Green Bond Markets Using Financial Innovation and Technology to Expand Green Bond Issuance in Latin America and the Caribbean, *Inter-American Development Bank Report*, 2019, available [online](#).

⁷¹ IMF/World Bank, FinTech: The Experience So Far, 2019, p. 14, available [online](#).

⁷² *Id.* at p. 14, para 15.



Toward Empirically Proven FinTech(s) Law

Most legal practitioners and pundits have rightly avoided making normative statements about FinTech law - instead simply reviewing existing laws for potential FinTech startups. Reiners (2018), Madir's (2019) edited comprehensive volume, and Brummer's (2019) self-authored one all represent examples of a broader gold-rush into the FinTech law advisory industry.⁷³ Looking more at the sustainable development side of FinTech (rather than merely at financial inclusion), Macchiavello and Siri (2020), usefully describes the Environmental, Social and Governance (ESG) requirements laid down in EU law for financial service providers.⁷⁴ Yet, their only criticism of swaths of regulations and requirements consists of technical observations aimed at making these rules work faster and better. Among the legal community then, there seems little critical evaluation of FinTech as a means of achieving positive financial inclusion or the SDGs.

Yet, in the academic journals, the approach has been far less modest. Magnuson (2018) describes the need to regulate FinTech as one of regulating small, highly interdependent online financial services providers.⁷⁵ Bradley's (2018) 'double edges' to FinTech represent the banality of much of this literature - with the author warning readers against the ill-defined risks and path dependence of FinTech once regulators start regulating.⁷⁶ Yadav's *Innovation Trilemma* does the same -- noting that regulating FinTech companies

⁷³ See Lee Reiners, *FinTech Law and Policy: The Critical Legal and Regulatory Challenges Confronting FinTech Firms and the Policy Debates that are Occurring Across the Country*, 2018. See also Chris Brummer, *Fintech Law in a Nutshell*, West Academic Publishing, 2019. See also Jelena Madir, *FinTech: Law and Regulation*, Elgar, 2019.

⁷⁴ Eugenia Macchiavello and Michele Siri, Sustainable Finance and Fintech: Can Technology Contribute to Achieving Environmental Goals? A Preliminary Assessment of 'Green FinTech', *European Banking Institute Working Paper 71*, 2020, available [online](#).

⁷⁵ Again, the author provides little quantitative evidence of such a target-the-small approach, and interest by large platforms and technology companies in FinTech seems to have muted his most critical observations. See William Magnuson, *Regulating FinTech*, *Vanderbilt Law Review* 71(4), 2018, 1167-1226.

⁷⁶ Christopher Bradley, *FinTech's Double Edges: FinTech's Promises and Perils*, *Chicago-Kent Law Review* 93(1), 2018, 61-96.

and applications may irrevocably harm development-friendly FinTech, if regulators can even define/identify these FinTech companies.⁷⁷

In the non-academic press, anything goes. The Bill and Melinda Gates Foundation's guidance for lawyers encourages legal changes promoting inclusion.⁷⁸ Yet, they provide no evidence that their proposals have caused one poor person to open a bank account or use online payment/money transfer services. A recent Congressional Research Service report lists the multiple US bodies likely to regulate various aspects of FinTech.⁷⁹ Yet, the report *assumes* that waves of regulatory requests and adverse market behaviour which regulators supposedly will need to anticipate. Concrete data underlies none of these standards and legal advice.

Formal and informal standard setting organizations have also gotten into the game. The Sustainability Accounting Standards Board (SASB) and International Financial Reporting Standards Foundation (IFRS) have already developed SDG-related standards.⁸⁰ The World Economic Forum has announced its own *Stakeholder Capitalism Metrics* -- again with pillars.⁸¹ These standards may also include those imposed by lenders, aid organizations and banks/brokers.⁸² In banking, the *Equator Principles* promote to encourage bankers to work toward achieving the SDGs, rather than earning interest margins and service fees.⁸³ None of these reports or metrics includes evidence that they help promote sustainable development in any way.

How do our results affect much of this advice? First, at the highest levels, ministers and senior public officials would rightly focus on providing efficient public services, rather than hope that FinTech technologies and service providers will somehow figure out a way to provide public goods. Second, lawmakers and regulators might demand evidence that mass-market digital finance, micro-insurance or subsidized green bonds actually do something positive -- rather than simply substitute one set of financial services providers for another. Third, governments should agree with their populations about the amount of tax payments needed for a level of SDG scores they wish to achieve. No amount of FinTech will replace taxes. Fourth, we should look for the factor which turns internet and mobile connectivity into sustainable development. Fifth and finally, boosters of FinTech-for-the-SDGs should recognize the U-shaped returns to such FinTech rulemaking. The more-is-better language employed by FinTech cheerleaders misleads policymakers and academics alike.

⁷⁷ Yesha Yadav, Fintech and International Financial Regulation, *Vanderbilt Journal of Transnational Law* 53(3), 2020, 1109-1146.

⁷⁸ For example, see Bill and Melinda Gates Foundation, Inclusive Digital Financial Services A Reference Guide For Regulators, 2019, p. 11, available [online](#).

⁷⁹ Andrew Scott, Fintech: Overview of Financial Regulators and Recent Policy Approaches, *Congressional Research Service Report R46333*, 2020, available [online](#).

⁸⁰ See IFRS Foundation, Consultation Paper on Sustainability Reporting, 2020, available [online](#).

⁸¹ Pillars seem to be the preferred decoration of choice for FinTech law boosters. See WEF and IBC, Measuring Stakeholder Capitalism: Towards Common Metrics and Consistent Reporting of Sustainable Value Creation, *WEF-IBC White Paper September*, 2020, available [online](#).

⁸² The World Bank's International Finance Corporation (IFC) represents one example, See IFC, Performance Standards on Environmental and Social Sustainability, 2012, available [online](#).

⁸³ IFC, Equator Principles Financial Institutions, 2021, available [online](#).

Conclusions

Pillars and wheels cover policy advice about FinTech. Since roughly 2015, international and regional organizations have promoted FinTech as a way of financing the sustainable development goals (SDGs). FinTech-related apps allowing for micro-finance, the tokenization of assets, peer-to-peer lending, and a host of other web-based apps promise to give the poorest access to resources. With access to these resources (so the story goes), the massive funding of social/public goods will help countries achieve their SDG targets. Yet, even by 2022, these efforts seem still-born. COVID-19 has delayed these activities by at least 5-10 years -- as the lowest income countries continue to focus on basic financial sector development and poverty-stricken segments of their populations.

Scant empirical evidence supports many of these approaches. The literature finds the same U-shaped relationship between FinTech and sustainable development which seems to govern traditional capital investment. In many other cases, anecdotal evidence -- like that appearing in *Science* or promulgated by large FinTechs -- obvious at problems even at first glance. Our world-wide econometric study of dynamic macroeconomic data coming out next year confirms this obvious truth.

Such a lacuna has not stopped organizations like the BIS, IMF or World Bank from their full-throat sale of legal advice governing FinTech services. Any list policies on which lawmakers must write draft black letter financial laws omits any evidence of such law 'working' anywhere in the world. At least one paper should point this out, in the middle of the present FinTech hype bubble.

