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# Financial Regulation of Consumer-facing Fintech in India: Status Quo and Emerging Concerns

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## Abstract

This paper attempts to answer the question, how is fintech regulated in India? The paper first analyses the types of consumer-facing fintech activities that are currently prevalent India. It identifies fourteen types of consumer-facing fintech activities in India. Together these fourteen types of activities constitute a typology of consumer-facing fintech activities in India. The paper further examines and compares the extent of financial regulation applicable to each fintech activity in the typology. A simple index of regulatory oversight is used to rank each fintech activity according to the financial regulation they attract. These rankings are summarised in a schematic to create the regulatory landscape of consumer-facing fintech activities in India. This regulatory landscape presents the status quo of financial regulation applicable to fintech in India. Clarity of the financial regulation applicable to fintech may help policymakers and regulators assess the appropriateness of their regulatory stance. The paper concludes with a discussion on some ways in which the financial regulator's toolkit may be recalibrated to address the risks and preserve the opportunities attendant to fintech. Finally, by outlining how fintech is regulated in India, the paper hopes to start a discussion on the more pressing policy imperative of how fintech should be regulated in India.

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# Contents

# 1. Introduction

Globally, there is a veritable explosion in the interest in and around fintech[2] and India is no exception. This interest in fintech is reflected in the venture-capital funding that the sector receives. Estimates for India suggest that ~USD 1.83 bn were invested in various fintech entities through venture capital and private equity (Medici PaisaBazaar Fintegrate, 2019) in 2018 alone. The regulators have also been keenly observing the space, examining fintech for its implications on the financial sector. In April 2018, the Reserve Bank of India (RBI) published the report of the Inter-Regulatory Working Group on FinTech and Digital Banking in India (hereafter referred to as the 'Sen Committee Report', after its chairperson Mr Sudarshan Sen). This is the first attempt to gauge the spread of fintech in India and look out for new regulatory considerations that may arise from its expansion. It takes stock of dominant innovations within the remit of the RBI and compiles innovations occurring across other (i.e. non-banking) sectors such as insurance and investment. Considering that fintech in still remain largely under-examined, the Sen Committee Report's first recommendation is to create a deeper understanding of the spread of fintech, its various types and its interaction with the existing financial sector (Reserve Bank of India, 2018). Financial sector regulators beyond the RBI are also investing in understanding the developments in fintech and devising appropriate regulator responses to them. They are experimenting with new regulatory tools such as the regulatory sandbox to help them respond to innovations in fintech, proportionately (Reserve Bank of India, 2019), (Pension Fund Regulatory and Development Authority, 2019). Governments at both the centre and state-level[3] are also trying to gauge the implications of emerging fintech innovations for the financial sector and devise proportionate legislative responses to it. The Department of Economic Affairs (DEA) under the Ministry of Finance also set up a Steering Committee on Fintech Related Issues in India in 2018 (Press Information Bureau of India, March).

Despite the almost euphoric market sentiment around fintech and an intensifying regulatory preoccupation, a clear snapshot of fintech activities which currently dominate in the country remains elusive. Currently the answer to the hypothetical but pertinent question, "*how is fintech regulated in India?*", remains unclear. The first recommendation of the Sen Committee Report emphasising "*the need to have a deeper understanding of various FinTech products and their interaction with the financial sector and, thereby, the implications on the financial system, before regulating this space*" [sic] (Reserve Bank of India, 2018) succinctly highlights the gaps in knowledge in the prevalent understanding of fintech in India.

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[2]Heuristically, Google Trend reports a surge in the search of the word `fintech' from 2014 onwards, with the term reaching its peak popularity, worldwide in November 2018. Curiously, the phrase `fintech' first surged to popularity in India in 2004 and had managed to stay present on the charts though witnessed a decline in low popularity. In India, the popularity of the term `fintech' peaked in May 2019.

[3]Among the Indian states, Maharashtra is the first state to enact its own fintech policy i.e. `Launchpad for fintech innovators'. The objective of Maharashtra's fintech program is to ``foster next-generation innovation across the financial services ecosystem to nurture exceptional FinTech firms that enable financial empowerment and technological advancement'' [sic]. The program incorporates several policy instruments including Accelerators, Fintech Registry, Grants and other monetary support to encourage the development of fintech within the state (Maharashtra State Government, 2019).

This paper attempts to bridge this gap in knowledge. The paper examines the most prevalent consumer-facing fintech activities in India and analyses financial sector regulation applicable them. This analysis contributes to the existing literature by: (i) creating a typology of consumer-facing fintech activities currently prevalent in the country, and (ii) analysing the financial regulation applicable to each type.

Remainder of the paper is organised into six sections. Section 2 elaborates on the research question and motivation for undertaking this analysis. Next, section 3 discusses the methodology adopted to answer the research question. The paper avails of the Preferred Reporting Items for Systematic and Meta-Analyses (PRISMA) framework to construct a typology of consumer-facing fintech dominant in India. This section also discusses the creation of a simple index of regulatory oversight, which helps in quantifying the financial regulation applicable to each type of fintech activity identified in the paper.

Section 4 identifies 14 types of consumer-facing fintech activities , creating the typology of consumer-facing activities in India.

Section 5 examines financial sector regulation applicable to each of these fintech activities by undertaking extensive secondary research. It avails the index of regulatory oversight to quantify financial regulation into numeric score ranging from 0 to 5. These findings are arranged to visually represent the regulatory landscape of consumer-facing fintech activities in India. This landscape is an ordinal representation of fintech activities according to the regulatory oversight they currently attract. It is *not* a commentary on how these fintech activities *ought* to be regulated. This regulatory landscape serves as an important tool to begin examining the question of *how fintech should be regulated?* Section 6 discusses some of salient features of these fintech activities and reflects on what it could mean for future course of regulation. The paper concludes by comparing the regulatory treatment with the risks inherent in some of the models to highlight some emerging questions for regulators.

# 2. The research question: *How is consumer-facing fintech regulated in India?*

While fintech innovation could potential occur across the value chain of financial services, this paper concerns itself with consumer-facing innovations. This analysis excludes any innovations which in the value-chain of financial services, which do not directly interface with the consumer. This self-imposed limitation offers a sound starting point for the analysis and helps navigate the vast swathe of fintech activities.

Anchored in this context, the paper attempts to the hypothetical question *How is fintech regulated in India?* The paper answers this question by deconstructing it into two distinct research exercises:

- *Constructing the typology of consumer-facing fintech activities prevalent in India:* This exercise identifies the types of consumer-facing fintech activities currently prevalent in India. As a first step, this part focuses on undertaking a literature review to identify a viable definion of fintech which of the many technological innovations in finance qualify as 'fintech'. The theoretical foundation provided by the definition becomes a basis for determining which of the many technological innovations in finance get qualified as fintech. The vast sea of diverse technological innovations is idenfied through a second literature review. Both the literature reviews for identifying a definition of fintech and for identifying the various technological innovations using the PRISMA framework. The section on Methodology discusses this in greater detail.

- *Identifying the financial-sector regulations applicable to these fintech activities:* Once the relevant categories of consumer-facing fintech activities have been recognised, the paper undertakes intensive desk research to gauge the regulatory treatment applicable to each category. These financial regulations are then converted into numeric scores using an index of regulatory oversight. These scores are used to rank the fintech activities in a decreasing order of financial regulation applicable to them, creating the regulatory landscape of consumer-facing fintech activities in India.

The nature of these question lends a descriptive character to the paper. The paper concerns itself with answering the positive question of *how the financial sector regulates consumer-facing activities in India* as opposed to the normative question of *what should be the optimal regulatory treatment of consumer-facing fintech activities in India.* By painting a picture of the landscape though, the paper serves as an important tool to answer the latter. In the absence of a clear understanding of the (financial) regulatory response towards the development of fintech in India, it is difficult to comment on its adequacy, effectiveness and proportionality.

In conclusion, the paper reflects on regulatory incongruence in terms of choice of tools and objective which emerge from a preliminary analysis of regulatory landscape. It ends with some headlines on the desirable regulatory stance towards fintech. By outlining *how fintech is regulated in India*, the paper hooks to start a discussion on the more pressing policy imperatives of *how fintech should be regulated in India.*

# 3. Methodology

As set out in the introduction, the paper answers the higher-level question of *how the financial sector regulates consumer-facing fintech in India,* by:

- constructing the typology of consumer-facing fintech activities in India, and
- identifying the financial regulation applicable to each fintech recognised above.

## 3.1 Constructing a typology of consumer-facing fintech activities in India

Currently, there is no consensus on which technological innovations in finance qualify as fintech, which is in part due to a muddled understanding of the term fintech itself. Therefore, in order to construct a typology of consumer-facing fintech, it becomes critical to identify a definition of fintech. Methodologically, constructing a typology of fintech requires answering two distinct sub-questions: (i) What is fintech? (ii) What are the types of consumer-facing fintech activities in India?

In order to identify a viable definition of fintech, this paper reviews the emerging academic and regulatory literature on the subject. The paper undertakes a comprehensive & systematic review of literature using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Moher D, Liberati, Tetzlaff, Altman, & (The PRISMA Group), 2009). To answer the second question, the paper repeats a similar PRISMA-led review exercise, this time focusing on regulatory and commercial literature discussing technological innovations in finance in India. PRISMA is a tool used to undertake systematic review of literature, especially in healthcare to minutely and comprehensively record discrete developments in the area of research interest. The validity and robustness of the framework depends on the quality of databases used and the criteria used to include studies in the review.

### 3.1.1 Defining fintech: A systematic review of literature

The primary objective of this work is to analyse the types of fintech activities that are prevalent in the Indian financial landscape and the extent of financial regulation applicable to them. Therefore, this paper concerns itself with literature focusing on (i) theoretical underpinnings of fintech; (ii) the types of fintech activities currently prevalent globally; (iii) the regulation of fintech; and (iv) the existing fintech ecosystem in India. Studies that focus exclusively on (i) a particular type of fintech, for instance crypto exchanges; (ii) the evolution of fintech in a particular geography except India, say the Netherlands; and (iii) business and operational aspects of fintech are excluded from the literature review. Research strategy includes using the search terms *''what is fintech?'', ''fintech'', ''fintech typology'', ''fintech in India'' and ''regulation of fintech in India''* on two academic databases, i.e. Google Scholar and Ideas RePec. The selection criteria for literature, and the total number of articles studied are captured in Annexure 1. As depicted in Figure A-1 in the Annexure, 69 pieces of academic work and consultancy reports were scanned across the two sources, i.e. Google Scholar and Ideas RePec. After accounting for duplicates and records that were not accessible at the

point, 52 entries were filtered. The abstracts of these 52 entries were analysed for relevance to the research themes, leaving 24 distinct academic pieces for the final analysis.

### 3.1.2 Types of consumer-facing fintech Activities: A review of the literature

The analytical approach towards compiling the models of consumer-facing fintech activities prevalent in India is iterative and inductive. The paper reviewed literature to identify publications that analyse the different fintech activities that are prominent in the Indian landscape. Academic literature on the subject being sparse, the scope of literature was expanded to include non-academic publications including reports and blog posts from management consultancies.

A search of the Google database, based on the search terms *'fintech business models in India', 'growth of fintech in India' and 'fintech in India'* yielded 21 relevant publications. Of these, three publications were excluded on grounds of either analysing fintech activities only tangentially or their findings being factually inconsistent with the Indian legal landscape. 18 shortlisted publications were used to construct the typology of fintech activities in India. Table A-1 in Annexure 2 presents the compendium of these 18 publications. Figure A-2 in Annexure 3 shows the process of selection of the publications. The different stages of the filtration process are set out in the annexure.

## 3.2 Identifying the financial regulation applicable to consumer-facing fintech activities in India

The analysis of financial sector regulation applicable to fintech activties is supported by an extensive desk research. This secondary research exercise delves into the relevant regulator's jurisdiction over a fintech activity, the objectives of regulation and the tools which they use to regulate these activities. This qualitative analysis of financial regulation is converted into numeric scores using the index of regulator oversight. These scores are used to rank the fintech activities in the decreasing order of financial regulation applicable to them.

This ranking only reflects the extent of financial regulation applicable to each fintech category and not the effectivenes of the applicable regulation. These scores are to be interpreted as ordinal ranks, i.e. the numeric difference between scores has no significance. The index builds atop three parameters:

- Identification of a regulator (to regulate the fintech activity);
- the existence of active regulation (in relation to the fintech activity); and
- the degree of regulatory oversight (subjected to the activity).

Figure 1 depicts the index of regulatory oversight. Each of these parameters are explained below.

- *Identification of a regulator:* The first index gauges if the fintech activity is under the purview of a financial sector regulator in the country. The idenfication of a regulator is fraught with unresolved questions around regulatory perimeter, considering their technology intensive processes of fintech activities and their indirect (even when significant) impact on the financial sector. Considering that the identification of a relevant regulator is a prerequisite for regulatory oversight, this becomes the first parameter for the index.

  Methodology: Existence of a regulator specific to a fintech activity translates into a score of 1. If the fintech activity doesn't fall in the direct oversight of any regulator, it is given a score of zero.

- *Existence of active regulation:* The existence of a regulator does not necessarily guarantee active regulation. Financial regulation tends focus on institutions or entities as oppose to functions. Therefore a regulator may by default become the regulator of a fintech activity because of its jurisdiction over the provider of the product. However, the prevailing regulatory framework may not actively regulate the fintech activity. For instance, the use of Robo-advisory in investment management, is left unregulated under the ongoing regulation for both mutual funds and registered investment advisers (RIAs) (SEBI, 2016), (Live Mint, 2019), even when RIAs are regulated by SEBI. An unintentional jurisdiction over a fintech activity by the virtue of jurisdiction over its provider will not be accounted for in this parameter.

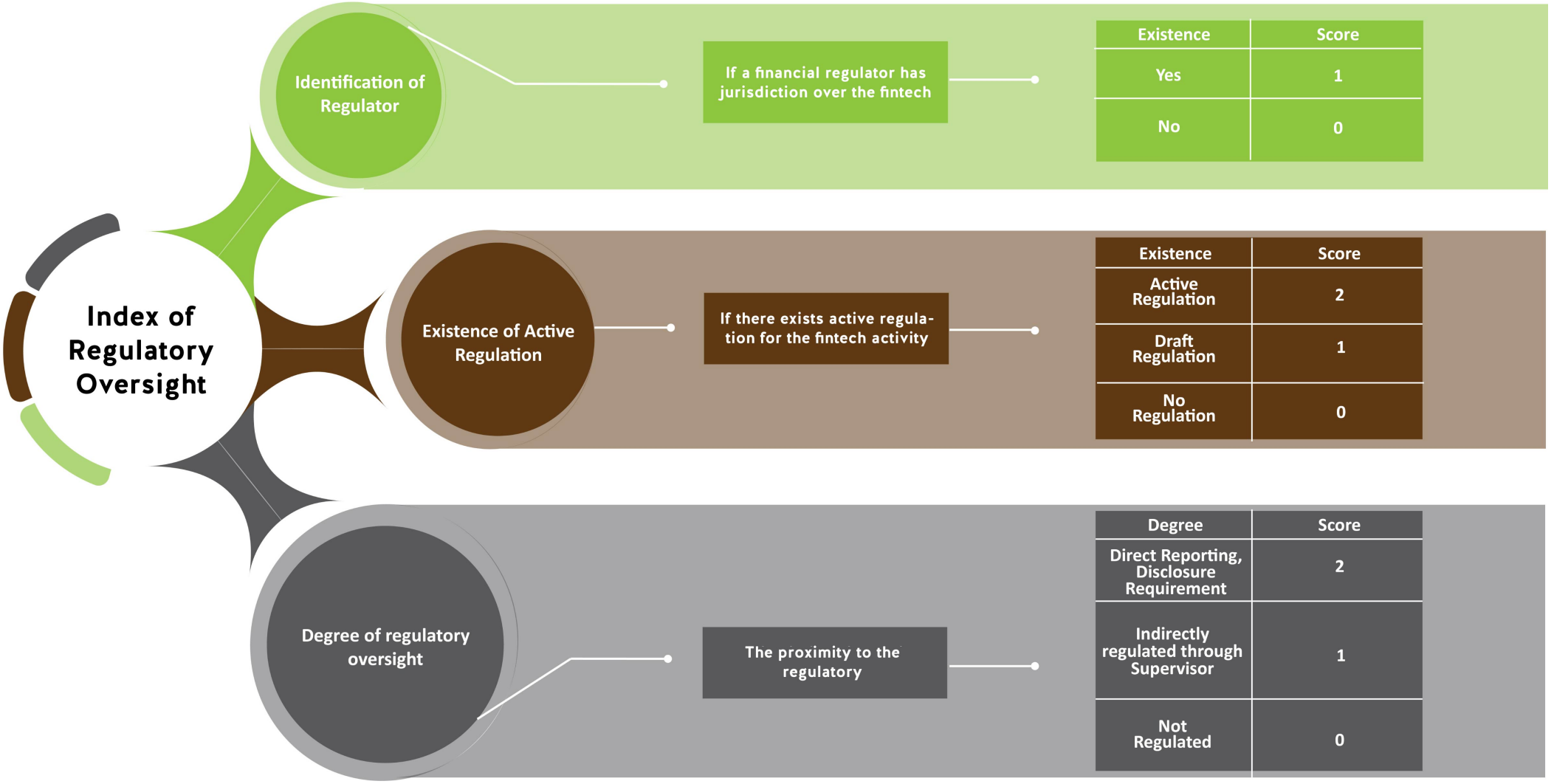
Methodology: As shown in Figure 1, this category identifies three stages of regulatory oversight. These are: (i) active regulation; (ii) proposed or draft regulation; and (iii) no regulation. In cases where fintech activities are being actively regulated they are given a score of 2. This is the highest score in this category. Activities for which, regulators have proposed regulation and are consulting stakeholders, get a score of 1. The complete absence of active regulation translates into a score of zero.

- *Degree of regulatory oversight:* Not all regulated entities attract equal amounts of regulatory supervision and oversight. On a principle-level, the degree of regulatory oversight should be determined by the level of risk posed by the concerned entity and often must account for available state capacity (Anyfantaki, 2016) (Government of India, 2013). This index gauges the degree of regulatory oversight including compliance requirements that is expected of the provider of the regulated activity. .

Methodology: To capture graded regulation, this variable is designed to take one of three mutually exclusive values- 2,1 or zero. The highest score of 2 indicates a high degree of active regulation, while a score of 1 indicates lighter regulation, possibly intermediated by a supervisor/ industry body, and zero is indicative of the lack of regulation.

Figure 1 depicts the interaction of these three parameters and their conversion into quantative scores. The highest degree of regulatory oversight corresponds to a score of 5 while a score of zero indicates that the fintech activity is not regulated in the country. It is quite obvious that if a fintech activity obtains a score of zero on the first parameter (reflecting the absence of a designated regulator), all subsequent parameters obtain a score of zero by default.

Figure 1: The dimensions of the index of regulatory oversight & their conversion into quantitative cores.



# 4. Constructing the typology of consumer-facing fintech activities in India

As emphasised earlier in the paper, it is hard to find a categorisation of consumer-facing fintech activities prevalent in India. To identify the various types of fintech activities, it is important to have a working definition of fintech. However, we still do not have a widely agreed definition of fintech (Reserve Bank of India, 2018). This section discusses the findings from a systematic literature review of the definitions of fintech being used in academic, commercial and regulatory parlances, undertaken using the PRISMA framework.

## 4.1 Defining fintech

Despite its wide-usage, stakeholders often harbour different ideas of what fintech refers to. Early academic literature defined fintech ''*phenomenon as technology-enabled financial solutions*'' (Arner, Barberis, & Buckley, 2015) which can go beyond specific functions of finance (say credit) and cover all kinds of products and services that have been traditionally provided by banks. Contemporaneously, alternative definition of fintech identifies it as ''*an economic industry composed of companies that use technology to make financial systems more efficient*'' (Wharton School, 2016). Clearly, while one definition conceives of fintech as the technology itself, the other perceives it as a technology-intensive sector complementing the financial sector.

A second issue that arises in conceptualising fintech is differentiating it from older instances of application of technology in the financial sector. Historically, finance and financial sector have been the leading adopters of technology. Over the past few decades, innovations have included credit cards in the 1960s, debit cards and cash dispensing terminals such as automated teller machines (ATMs) and telephone banking in the 1970s and 1980s (Financial Stability Board, 2017). It is hard to differentiate technological adoption in finance that creates efficiency gains from fintech. Unfortunately, neither academic scholarship nor regulatory thinking have yet arrived at a satisfactory definition of fintech or cite the rationale for its categorisation as a separate phenomenon. Some scholars observe that fintech has been able to introduce, new, non-financial players in the value chain of financial services which distinguishes it from the previous phases of technological innovation in financial services (Arner, Barberis, & Buckley, 2015). They also propose that the rise of fintech in the developed world can be attributed to the financial crisis in the developed countries, and to the inefficiencies in the existing financial sector in the developing countries (Arner, Barberis, & Buckley, 2015), (Darolles, 2016). Other reasons cited for the emergence of fintech include the rampant digitisation of financial services which facilitated personalisation of financial services and an expressed demand for personalised products from the younger generation (Darolles, 2016), (Anyfantaki, 2016). Similarly, research on obstacles to adoption of fintech reveal that ease of use and credibility have a positive effect on intention to adopt fintech while concern for information privacy is found to obstruct the adoption of fintech (Kim, Park, Choi, & Yeon, 2016). While these discuss factors behind the rise of fintech, they fall short of offering a definition of fintech that can distinguish it from the adoption of technology, which is typical of the financial sector.

The Basel Committee of Banking Supervision (BCBS) has opted to use the Financial Stability Board's (FSB) working definition of fintech as ''*technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services*'' (Financial Stability Board, 2017). Evidently, this working definition of fintech is also very broad. It regards new business models and products as well as processes as fintech. This recreates the challenges of distinguishing the adoption of technology in finance till-date from fintech.

The limitations of this definition are also visible in the Sen Committee Report. When cate-gorising fintech innovations, it emphasises the lack of a *''commonly accepted taxonomy of fintech''* (p. 7, Inter-Regulatory Working Group on FinTech and Digital Banking in India, 2018) and anchors its categorisation of fintech in the FSB's definion of fintech. This framing leads the report to regard both- emerging business models and technological innovation as fintech innovations. While crowdfunding may qualify as fintech, it appears hard to justify same for smart constracts. Consequently, both smart contracts and crowdfunding are recognised as fintech innovations. It appears that, smart contracts are a technological innovation with use cases beyond finance and does not relate to any particular function of finance. However, crowdfunding is a new way of performing a function of finance, built atop technological innovations. In the opinion of the author the former should just be characterised as technological advancement while the latter could qualify as fintech. This leads us to the final limitation of defining fintech. The third challenge of defining fintech is differentiating it from traditional finance. Currently, the approach to defining fintech is relative, pegging it to what the state of play in mainstream finance is. Further, the perception of mainstream itself rests on the levels of technological adoption prevalent in established/ regulated institutions, which is bound to evolve overtime. Therefore, the current conception of fintech is hinged on relative and subjective understanding of what the mainstream is.

This paper adapts the framing of the FSB to identify and classify fintech innovations in India, i.e. "*technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services".* The paper however, focuses only on new business models, applications and products and leaves out processes from the scope of fintech. It further qualifies the *materiality of effect on financial markets and institution* by examining if the activity creates new pathways of fulfilling a financial function. Though the qualifier new also introduces subjectivity in the definition of fintech, it remains valuable.

This paper considers a technological innovation as fintech, if it can unlock new value for consumer by making a financial product available to them. If the innovation goes on to improve the users' experience of existing products only, or makes them more efficient, it should be characterised as technological advancement generating gains due to efficiency. The author is conscious of the objective limitations of these qualifiers, however together they offer a useful steer for separating fintech from technological adoption in finance, in the absence of better theoretical framework.

## 4.2 Identifying the types of consumer-facing fintech activities in India

The acceptance of both financial products (or business models) and technologies as fintech, presents a challenge for creating a typology of fintech. This muddles any attempts at creating a coherent typology. Most works on typology of fintech include assortment of different parameters such as types of financial services, new technologies etc. For instance, Schindler recognises five categories of fintech innovations, these include (i) online marketplace lending (called peer-to-peer lending by some), (ii) equity crowdfunding, (iii) robo-advice, (iv) financial applications of distributed ledger technology, and (v) financial applications of machine learning (Schindler, 2017). While categories (i) through (iii) relate to specific financial services, categories (iv) and (v) relate to a technology. Some works also include regtech as a type of fintech (Haddad & Hornuf, 2015), (Arner, 2016b). Other works take a completely segmented approach to fintech innovations. For instance, Lee & Jae Shin categorise fintech by the financial service they offer, leading them to identify (i) payments; (ii) wealth management; (iii) lending; (iv) crowdfunding; (v) capital market; (vi) insurance fintech (Lee & Jae Shin, 2018). These categories alternate between a specific sub-sector within finance (say capital market) and specific business models (say crowdfunding).

The FSB in its review of systemic implication of fintech organises fintech innovations along the well-recognised four categories of financial services: (i) payments, clearing and settlement; (ii) deposits, lending and capital raising; (iii) insurance; (iv) investment management; and a fifth component (v) market support (Financial Stability Board, 2017). This paper utilise this framework and limits itself to consumer-facing fintech activities in India. In the 'market support' category, the paper limits itself to consumer- facing fintech and does not probe into the B2B spectrum.

## 4.3 The typology of consumer facing fintech landscape in India

Applying this framework to the swathe of to fintech activities prevalent in India, yields a typology of 14 consumer facing fintech activities. This typology is set out in table 1.

TABLE 1: Typology of consumer-facing fintech activities in India

| No. | Fintech Providers | Examples |
|---|---|---|
| **Insurance** | | |
| 1 | Insurance Web- Aggregators | Policy Bazaar, EasyPolicy |
| 2 | Insurtech providers | Bajaj Allianz, Videocon Liberty |
| **Payments, Clearing & Settlement** | | |
| 3 | Payments Services Providers | RazorPay |
| **Deposits, lending and raising capital** | | |
| 4 | P2P Lending Platforms | Faircent, LendBox |
| 5 | Alternative Lenders | LendingKart |
| 6 | Alternative credit-risk modelers | Algo360 |
| 7 | Credit Enablers | CreditMantri |
| 8 | Credit Products Comparators | BankBazaar, Paisabazaar |
| 9 | Crowdfunding | Let's Venture, 1Growth, Milaap |
| **Investments Management** | | |
| 10 | Providers of Robo Advisory | OroWealth, FundsIndia |
| 11 | Mutual Funds Direct Plan Aggregator | BharosaClub, Zerodha Coin |
| 12 | Personal Finance Management Apps | Walnut |
| **Market Support** | | |
| 13 | Hybrid Platforms | Paisabazaar |
| **Miscellaneous** | | |
| 14 | Cryptocurrency based service providers | Unicoin, Coinmama among others. Popular cryptocurrency wallets include Zebpay & BuyUCoin |

## 4.4 Description of the typology of fintech activities in India

This section briefly describes each fintech activities identified in table 1.

A. **Insurance**

i. *Insurance Web-aggregator:* The IRDAI (Insurance Web Aggregators) Regulations, 2017 interpret Insurance Web Aggregator *''as an insurance intermediary who maintains a website for providing interface to the insurance prospects for price comparison and information of products of different insurers.''*

ii. *Tech-based insurance providers:* Data from wearable devices, telematics can help inform the insurer of a more accurate condition of the person/ motor vehicle being insured. The IRDAI constituted a Working Group to *"examine the innovation in insurance involving wearable/ portable devices"* (IRDAI 2018). The use of these devices is likely to result in personalised premiums and '*pay as you use*' models.

B. **Payments, Clearing & Settlement**

Payments appears to be the most tightly regulated sector in the country. Most technological innovations have occured within the regulated system. The participation of new non-financial entrants has also been steered through regulatory developments, such as the Prepaid Instruments.

iii. *Payments Services Providers:* Though Payments Services are not defined in the PSSA 2007, the draft Payments and Settlements Systems Bill 2018 (Ministry of Finance, Government of India, 2018), defines Payments Services to include *"any business activity covering: (i) execution of payment instructions, including transfers of funds in relation to an account of a consumer with a system provider, (ii) execution of payment instructions where the funds are covered by a credit line, (iii) issuing of payment instruments and/or acquiring of payment instructions, (iv) issuing of prepaid instruments, (v) money remittance."* This definition of payments services includes aggregating and executing payments instructions, providing payments processing services such as payments gateways and third-party apps that can initiate payments transactions. Limiting our analysis to innovations in business models, products and applications, we identify two broad categories of innovations (i) digital payments, and (ii) USSD-based payments.

C. **Deposits, Lending and Raising Capital**

iv. P2P Lending Platforms: The RBI Master Directions on NBFC P2P Lending Platforms defines a P2P Lending Platform as, ''[an] intermediary providing the services of loan facilitation via online medium or otherwise, to the participants.'' (RBI, 2017).

v. Alternative Lenders: they provide loans to consumers and businesses by ''analyzing their alternate data including but not limited to transaction on history, social media etc'' (Reserve Bank of India, 2017-2018). Currently there is no universally agreed upon definition of 'alternative data', it is used as, ''a catch-all phrase to describe data that is not currently reported on mainstream credit reports'' (FICO Blog, 2012). Some emerging models include lending on the basis of invoices, transactions' history and combining payments with credit in the form of 'pay-later' products.

vi. Alternative credit risk scores: In the consumer financial marketplace, alternative credit data includes to information used to evaluate creditworthiness that is not usually part of a traditional credit report (Experian, 2018). Analytics companies that process the non-traditional financial information to assess creditworthiness are alternative credit scorers.

vii. *Credit Product Comparators*: Comparators aggregate and compare different kinds of retail credit instruments such as personal loans, education loans, credit cards etc.

viii. *Credit enablers*: Credit enablers help individuals with poor credit history to improve their credit score by providing analysis of credit reports and guiding users on managing their cash-flows. They also curate personalised credit offers for consumers, reducing their chances of rejection. .

ix. *Crowdfunding*: The SEBI consultation paper on crowdfunding in India defines *crowdfunding* as "*solicitation of funds (small amount) from multiple investors through a web-based platform or social networking site for a specific project, business venture or social cause*" (Securities and Exchange Board of India (SEBI), 2014)

D. **Investment Management**

x. *Mutual Funds Direct Plan Aggregators:* They aggregate and provide a platform to invest in Direct Plans of Asset Management Companies (AMCs).

xi. *Providers of Robo Advisory:* They offer financial advice by automated, money management providers, thereby "*disintermediating human financial advisors"* (Reserve Bank of India, 2017-2018). This often makes use of alternative data and machine learning algorithms.

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xii. *Personal Finance Management Apps:* These apps track expenses and inflows of income for users.

E. **Market Support:**

xiii. *Hybrid Platforms:* Hybrid Platforms are common platforms for *selling* a range of financial instruments from across the different financial sectors. They act as a marketplace for different types of credit instruments (credit cards, personal loans, education loans etc), insurance instruments (term life insurance, health insurance, car insurance etc) and investment instruments (mutual funds, fixed deposits, savings accounts).

F. **Miscellaneous**

xiv. *Cryptocurrency based service providers:* The Cryptocurrency universe comprises four distinct players- Exchanges, Wallets, Payments and Miners (Hielman & Rauchs, 2017).

# 5. The regulation of consumer-facing fintech in India

This section analyses the financial regulation applicable to each type of consumer-facing fintech activity idenfied in the paper. The regulatory treatment is then converted into quantative scores using the index of regulatory oversight. The section concludes by presenting the ordinal arrangement of fintech activities, ranked in the decreasing order of regulatory oversight.

i. **Insurance Web Aggregator***:*

(a) The fintech activity: The IRDAI (Insurance Web Aggregators) Regulations, 2017 interpret Insurance Web Aggregator *''as an insurance intermediary who maintains a website for providing interface to the insurance prospects for price comparison and information of products of different insurers (IRDAI, 2017).''* They are online portals that enable the comparison of different insurance products from different insurers.

(b) The typical business model: Typically, they present the features of different insurance products in a table comparing attributes such as cover amount, payout, settlement rates for claims, and the premium. The aggregators charge insurers a fee to display their insurance products on its platform, which is capped at INR 50,000 annually by IRDAI. They can also generate revenue when the leads generated by them for an insurer get converted into sales.

Some popular examples of Insurance Web Aggregators include Policybazaar, and EasyPolicy. As of February 2019, IRDAI had registered 24 entities as Insurance Web Aggregators.

(c) Applicable regulation and corresponding score:

- *Identification of a regulator:* They are regulated by the IRDAI. The corresponding score is 1.
- *Existence of Active Regulation*: IRDAI (Insurance Web Aggregators) Regulation 2017 regulates Insurance Web Aggregators. The corresponding score is 2.
- *Degree of regulatory oversight*: These institutions are regulated closely by the IRDAI. The regulator lays out licensing conditions, permissible business activities, conduct, minimum paid-up capital and maximum fee. The corresponding score is 2.

Being tightly regulated, this category gets a score of 5.

ii. **P2P Lending Platforms**:

(a) The fintech activity: The RBI Master Directions on NBFC P2P Lending Platforms defines a P2P Lending Platform as*, ''[an] intermediary providing the services of loan facilitation via online medium or otherwise, to the participants.''* (RBI, 2018) Peer-to-Peer lenders match borrowers to lenders by providing them a platform to interact. Popular examples of P2P Lenders include Faircent, Lendbox among others.

(b) The typical business model: P2P NBFCs are mandated by law to only act as intermediaries. Together, Section 6 (iii) and Section 6 (vi) of the Master Directions prohibit the platform from either lending on its own or retaining the funds received from lenders or borrowers on their balance sheet (RBI, 2018).

(c) Applicable regulations and corresponding scores:

- *Identification of a regulator:* The RBI regulates P2P Platforms through the Master Directions on NBFC P2P Lending Platforms. The corresponding score is 1.
- *Existence of active regulation:* The Master Directions of the RBI prescribe the permissible activities, prudential regulatory requirements including leverage ratios, balance sheet restrictions and operational guidelines. The corresponding score is 2.
- *Degree of regulatory oversight:* The NBFCs are required to get registered, obtain Certificate of Registration from the RBI, report data to Credit Information Companies and appoint Nodal Officers under the Ombudsman Scheme. It gets a score of 2.

*This category gets a total score of 5.*

iii. **Payments Services Providers:**

(a) The fintech activity: Most fintech innovations in the payments sector are modelled around the diverse payments channels offered by the National Payments Corporation of India (NPCI). Digital payments solutions rely on either the Immediate Payment Service (IMPS) or the Unique Payment Interface (UPI), both of which are operated by the NPCI. NPCI is a consortium of banks responsible for designing retail payments products in the country. Though the NPCI is regulated through the PSSA 2007, it creates its own operating guidelines for its products such as the UPI. However, products introduced by the NPCI require providers to be authorised by the RBI and hold various licenses such as those for mobile banking and RTGS Membership. Therefore, execution of a payment instruction is regulated in the country.

Payments Gateways are another aspect of digital payments. They perform the function of Point of Sales (PoS) machine in the analog world. Payments Gateways are currently not regulated by the RBI and are supervised through industry standards set out in the Payments Card Industry Data Security Standards (PCI DSS). It is worth emphasising that two perhaps, conflicting policy moves are being contemplated in the regulation of the Payments space. The RBI in its Statement on Developmental and Regulatory Policies has indicated the need and inclination to regulate Payments Aggregators and Payments Processors, considering their growing significance in materialising payments (RBI, 2019). A second policy move was recommended in the Report of the Inter-Ministerial Committee on the Finalisation of Amendments to the PSS Act 2007 (Ministry of Finance, Government of India, 2018). The Report recommends creating a Payments Regulatory Board (PRB) independent of the RBI for regulating the payments sector.

The Report has contemplated a draft legislation and an enforcement system with the PRB at the helm to implement this vision. Therefore, this sector is likely to undergo significant changes either way.

(b) The typical business model: The typical business models include designing products using the underlying infrastructure of UPI, USSD, IMPS. These include wallets such as Paytm, UPI based apps such as Google Tez. Payments Gateways validate customer's transaction details securely, they ensure funds are available for the payment and complete the payment transaction in return of a TDR i.e Transaction Discounting Rate, per transaction from the merchant. Examples of Payments Gateways include Razorpay, PayYouBiz among others.

(c) Applicable regulations and corresponding scores: The mix of regulated and unregulated activities within Payments Services is reflected in the category's scoring of regulatory oversight below: .

- *Identification of a regulator:* RBI. Therefore, the corresponding score is 1.
- *Existence of active regulation:* The RBI regulates the PSOs directly through the PSSA, 2007. The regulation of the specific payments' medium offered by the PSOs is also subject to direct and indirect regulation by the RBI. For instance, to provide UPI services, entites must have mobile-banking licenses and RTGS membership, both offered by the RBI. Therefore, the corresponding score is 2.
- *Degree of regulatory oversight:* Various Payments Services are subject to non-uniform and even indirect regulation of the RBI. Credit Cards are regulated directly by the RBI, UPI is indirectly regulated by the RBI (through the regulation of the NPCI and the providers), while Payments Gateways are currently unregulated. Therefore, the corresponding score is 1.

*This category gets a total score of 4.*

iv. **Providers of Robo Advisors:**

(a) The fintech activity: Robo advisory is "*the provision of financial advice by automated, money management providers, thereby disintermediating human financial advisors*" (Reserve Bank of India, 2017-2018). The algorithmic decision-making mechanism may use consumers' alternative data to offer financial advice. Currently both Mutual Fund Distributors (MFDs) and Registered Investment Advisers (RIA) provide advisory. .

(b) The typical business models: Robo advisory offers investment advice to users by accounting for their willingness to pay, their ability to pay and their investment goals. While data on financial goals tends to be self-reported, other indicators are assessed through the use of both alternative and traditional financial data. Lower cost of robo advisory allows it to target retail customers regardless of their income (Jung, Dorner, Glaser, & Morana, 2018). currently both SEBI's RIA and AMFI registered MFD offer robo advisory, though the latter are not permitted by law. RIAs can offer robo advisory in the normal course of their advice business. They charge an advisory fee from their client and cannot receive any commission from a specific mutual fund for recommending it to the client.

RIAs have the fiduciary responsibility to act in the best interest of the client. MFDs also offer robo advisory, however it appears that they do not refer to it as such. MFDs use algorithms to understand the performance of mutual funds and suggest the top-performing funds as per the buyers' needs of short term/ long term or tax-saving investment. They do not appear to profile the risk of the buyer, instead they use algorithms to study the performance of mutual funds, thus being able to prevent being qualified as an advisor. They charge commission from the mutual fund and usually the buyer is not charged any fee.

Popular RIAs offering robo advisory include: Bharosaclub, Orowealth among others. Popular MFDs using algorithms to shortlist mutual funds include Scripbox, FundsIndia among others.

(c) Applicable regulation and corresponding scores: As per SEBI Guidelines (SEBI (Investment Advisers) Regulations 2013), RIA may apply any "tools" for profiling risks of the user while offering them advise. Section 16 of the Regulations requires any tools used for risk-profiling to be fit for purpose and any limitations whenever identified in these tools, must be mitigated. MFDs on the other hand, are not directly regulated by SEBI. They are regulated by the industry body, AMFI and abide by the code of conduct laid out by it. Gauging the extent of regulation applicable:

- *Identification of a regulator*: SEBI directly regulates RIAs and ensures regulation of MFDs through AMFI. The corresponding score is 1.
- *Existence of active regulation*: SEBI addresses the subject of robo advisory only tangentially in its Regulations. It does not clearly define 'limitations' in the tools and does not refer to their ability and accuracy in profiling risks. It also does not oblige RIAs to demonstrate their effectiveness. The effective score is therefore 1. .
- *Degree of regulatory oversight*: Though the RIA's are subject to high degree of oversight, it is unclear if the regulator undertakes any specific audits or checks of the tools used for robo advisory. It therefore gets a score of 1.

*This category gets a total score of 3.*

v. **Alternative Lenders:**

(a) The fintech acvity: Alternative loans are means to offer consumer and business loans by *''analyzing their alternate data including but not limited to transaction history, social media etc.'' (Reserve Bank of India, 2017-2018)*.

(b) The typical business models: Alternative lenders in India integrate alternative credit risk models with an NBFC at the front end to disburse loans to consumers.

(c) The extent of regulation applicable and corresponding scores: The RBI does not specifically regulate the process of assessing creditworthiness or credit underwriting. The Master Circular on Loans and Advances -Statutory and Other Restrictions (Reserve Bank of India, 2015) emphasises the need for regulated entites to assess

the borrower's credit worthiness correctly. Gauging the extent of regulation:

- *Identification of a regulator:* RBI. Therefore, the corresponding score is 1.
- *Existence of Active Regulation:* There are no exclusive regulations in place for regulating alternative credit underwriting solutions. Therefore, the corresponding score is 1.
- *Degree of regulatory oversight:* Alternative credit underwriting is not subject to regulatory oversight separately. Its regulation is subsumed under the regulation of the NBFC. Therefore, the corresponding score is 1.

*This category gets a total score of 3*.

vi. **Mutual Funds Direct-Plan Aggregators:**

(a) The fintech acvity: They aggregate and provide a platform to invest in Direct Plans of Asset Management Companies (AMCs). SEBI Master Circular issued in 2013 mandates AMCs to provide a separate plan for direct investment not routed through the distributors. Such separate plans are mandated to have a lower expense ratio excluding distribution expenses, commission, etc., and no commission can be paid from such plans Section 5, (SEBI Master Circular for Mutual Funds, 2013).

(b) The typical business models: All AMCs through their websites, Registrar and Transfer Agents such as CAMS and Karvy and portals registered with SEBI as RIAs or Investment Advisers (INs) offer the investors a means to invest in direct plans. Another new entity which offers this service is the Mutual Funds Utility (MFU) which operates under the aegis of the AMFI. The MFU is a collaboraon of AMCs affiliated to AMFI. It acts as a dashboard for the investor, allowing consolidated access to assets across AMCs. Most portals are registered as RIAs or Investment Advisers (INs) and collect advisory fee for managing investments. However, some portals such as Kuvera are now offering these services completely free of charge (KUVERA, 2019). In these cases, providing value added services such as Alternave Investment Funding appears to be a source of revenue (KUVERA, 2019) (Livemint, 2018). There are several popular platforms including myCAMS, Kuvera, BharosaClub, Zerodha Coin.

(c) Extent of applicable regulation and corresponding scores:

- *Identification of a regulator*: Direct plan are regulated by SEBI, the corresponding score is 1.
- *Existence of Active Regulation*: SEBI regulates the direct plan product, however, does not offer guidelines with respect to the investment platform. Therefore, the corresponding score is 1.
- *Degree of regulatory oversight*: These platforms are not a subject of direct regulation. Therefore, the corresponding score is 1.

*This category gets a total score of 3.*

vii. **Crypto-currency based service providers:** .

Bitcoins, like other types of digital currencies are *''digital assets designed to work as a medium of exchange''* (ElBahrawy, Alessandre, Kandler, Pastor-Satorras, & Baronchelli, 2017). More generally, a cryptocurrency is a method of creating virtual *coins* and providing for their secure ownership and transaction by using an underlying cryptographic problem (Harwick, 2016)

a. The fintech activity: The Cryptocurrency universe comprises four distinct players- Exchanges, Wallets, Payments and Miners (Hielman & Rauchs, 2017). The first three are consumer-facing fintech products while the mining segment can be considered as a back-end operation.

b. The typical business model: Cryptocurrency Exchanges either charge a fee for the various services they offer on their platform such as trading, deposit or they sell and purchase at different rates, differential being the source of revenue. The differential in the buying and selling price appears to be the dominant revenue stream.

The business model of (software) cryptocurrency wallets appears to be generating fee from affiliates and revenue generated from passing leads to cryptocurrency exchanges. Contrary to popular belief, cryptocurrency wallets do not charge transaction fee. It seems that they charge a network fee which is usually passed on to the miners (Ohayon, 2018). The revenue model of hardware wallets is straight-forward. They generate revenue from selling the hardware wallet. (A hardware wallet is a physical device that enables investors to store their private key (Larcheveque, 2018)). Cryptocurrency payment gateways apparently charge transaction fee for materialising predominantly three kinds of transactions (i) online payments; (ii) in-store; and (iii) e-commerce. The business model is akin to the regular payments' gateways. Popular example of crytocurrency exchange include Unicoin, Coinmama among others. Popular cryptocurrency wallets include Zebpay, BuyUCoin among others. Popular cryptocurrency gateways include Bitcoin India.

c. Applicable regulation and corresponding scores:

- *Identification of a regulator:* Cryptocurrency is a decentralised, computer-based program and therefore the regulatory tools applicable to it may differ. But the RBI has taken the regulation of cryptocurrency upon itself. The corresponding score is 1.

- *Existence of Active Regulation:* Until April 2018, the RBI only closely monitored the space and issues cautionary advice for general public. However, it banned RBI regulated entites from dealing in or facilitating the dealing of virtual currencies (Reserve Bank of India, 2018). RBI's ban of regulated entites dealing in VC led a petition to be filed in Supreme Court (SC) India. Currently, the hearing is underway, and the SC has given the

government time till end of March 2019, to come up with a framework for regulation of cryptocurrency (The Hindu Business Line, 2019). Therefore, the corresponding score is 1.

- *Extent of Regulatory Oversight:* Considering that currently there is no direct regulation of cryptocurrency in place such as registration of cryptocurrency exchanges, active consumer protection of cryptocurrency users or subjecting cryptocurrency transactions to AML provisions, the corresponding score is 0.

*This category gets a total score of 2.*

viii. **Insurtech providers**

a. The fintech activity: Insurtech relies on alternative data to personalise users' premiums. It avails of different IoT enabled devices such as wearables (for health insurance) and telematics (for automobile insurance) to collect alternative data that aids in personalising underwriting. The use of technology can allow better segmentation, tailored models for charging premiums and also tailored premiums such as according to fitness and well-being efforts in health insurance and pay-as-you-go, pay-how-you drive (PHYD), manage-how-you-drive (MHYD), and the other models in vehicle insurance.

b. The typical business model: The typical business model relies on generating insights from alternative data, telecommunication devices and wearable devices. Together these data are used to offer tailored premiums. Currently IRDAI's fixed premium policy does not allow variable premiums needed for these models, so insurers are only passing the benefits to the user as one time discount (Livemint, 2018). Bajaj Allianz has recently incorporated the use of telematics in its car insurance, through DriveSmart Service (Bajaj Allianz). Videocon Liberty group earlier tried offering *pay-as-you-drive* models as early as 2013, When it did not receive traction at the time (Business Standard, 2013).

c. Applicable regulations and corresponding scores: IRDAI is currently contemplating the use of telematics in vehicle insurance, and Insurtech in general however, there does not appear to be an express prohibition on the use of technology in insurance, currently (IRDAI, 2017).

- *Identification of a regulator:* IRDAI, the corresponding score is 1.
- *Existence of Active Regulation:* Currently there is no active regulation for the use of Insurtech or telematics. The Working Groups have also only put out preliminary reports with no indication of draft regulation (IRDAI, 2018) (IRDAI, 2017). The corresponding score is 0.
- *Extent of Regulatory Oversight:* Nil. The corresponding score is 0.

*This category gets a total score of 1.*

ix. **Crowdfunding**

(a) The fintech acvity: Crowdfunding activities can be of three different kinds (i) equity crowdfunding (ii) donor-based crowdfunding, (iii) reward-based crowdfunding. In 2014, SEBI had placed a consultation paper on crowdfunding (SEBI, 2014) in public domain. The paper prohibited equity-based crowdfunding in India, however, SEBI never followed through with any regulations on crowdfunding in India (Rajya Sabha, 2018).

(b) The typical business model: The typical business model relies on matching investors with entrepreneurs, typically not listed on stock exchanges in the country. They generate revenue by levying a listing fee on the entrepreneur. Popular examples include 1Growth and Let's venture. .

(c) Applicable regulations and corresponding scores: Though regulation of crowd-funding rests with SEBI, currently, there is no active regulation of crowdfunding in India. .

This category gets a total score of 1.

x. **Providers of alternative credit underwriting and alternative credit scores**

(a) The fintech acvity: Alternave credit scoring is an assessment of credit worthiness of a borrower using alternave data and algorithmic modeling. These credit-decisioning models may factor in non-tradional information such as the type of device owned (Apple or Android), the website last visited or if the borrower uses their name in their email id, to predict the credit-worthiness of the borrower (Berg, Burg, Gombovic, & Puri, 2018). Alternative credit scores are used by regulated enes to offer typical loans i.e. assess a loan application and use alternative scores for decision making or for embedding loans in e-commerce transactions such as *pay-later*.

(b) The typical business model: Alternative credit scorers acquire diverse kinds of personal data and create algorithmic models to predict the creditworthiness. Revenue is generated from integration of the process into the lenders' existing app and is also tied to the volume of analytics undertaken (Algo 360).

(c) Applicable regulations and corresponding scores: Credit-underwring per se is not regulated in the country. Technological platforms that only provide algorithmic credit-underwring models are not regulated. Under the current regulatory regime they may be regulated predominantly for operaonal risks by the RBI's `Directions on Managing Risks and Code of Conduct in Outsourcing of Financial Services by NBFCs',(Reserve Bank of India, 2017). The regulations require NBFCs to assess the various risks involved in the Outsourcing Agreement and ensure that the third party has systems in place to deal with them. Alternative credit underwriting, as a financial activity is not regulated currently. .

*Therefore, the corresponding regulatory score is 0.*

xi. **Credit Enablers:**

(a) The fintech activity: Credit enablers help thin filed consumers and consumers with a poor credit history to build and improve their credit score. The typical model is a combination of the services offered by alternative lenders, credit product comparators and wealth management apps. They help borrowers with poor or no credit history to remedy or build their credit history. In the process, they may also map prospective borrowers to lenders.

(b) The typical business model: They can receive fee from banks/ lending institutions for originating consumers. They can levy service charges on the consumers.

(c) Applicable regulations and corresponding scores: In the absence of an activity or function based approach to regulation, activities of origination are not regulated per se.

*Therefore, the corresponding regulatory score is 0.*

xii. **Personal Finance Management Apps**

(a) The fintech activity: Personal Finance Management is offered through apps that can be downloaded from Google and Apple app stores. They began as a means of tracking expenses and incomes but have now evolved their services. Some new features include accessing a real-time credit score, setting reminders for due payments, bill-splitting features etc.

Increasingly these apps are evolving into providers of other financial products such as credit, investment instruments etc. Walnut for instance started as a personal finance management app and has now incorporated a permanent credit-line by integrating with an NBFC (Russell, 2018). As a process, they obtain user information from SMS analycs as well as by enabling the user to link debit and other accounts with the app. Graphical representation of expenditure and savings patterns are common offerings across apps.

(b) The typical business model: Stand-alone apps often are purchased from the app store. They may also generate revenue from advertisements. Some apps that are available for free are often offered by bigger platforms and are used to up-sell financial products, such as BankBazaar. Popular apps include Walnut, Monito, BankBazaar among others.

(c) Applicable regulations and corresponding scores: Till the me the apps only track expenses and income, they are unregulated. However, the movement in the sector shows that often the financial management app acts as a gateway to availing of credit and investment (My Universe by Aditya Birla, Walnut Prime by Walnut). When integration with other regulated products happens, they are regulated by the relevant regulator. By themselves, Personal Financial Management Apps are unregulated.

*This category, therefore, gets a total score of 0.*

xiii. **Credit Product Comparators**

(a) The fintech acvity: Credit Product Comparators aggregate and compare different kinds of retail credit instruments such as loans, credit cards etc. They also channel the borrowers' request to access their credit scores from one of the Credit Informations Companies (CICs). Some partner with specific CICs and provide free, regular credit report updates to the borrower. For each category- credit cards, personal loans, home loans they display offers from competing financial institutions and make customised suggestions to borrowers.

(b) The typical business model: The typical business model relies on generating revenue from generating new borrowers for credit institutions and offering investment advice, in cases where the platform also provides investment products. Popular examples include Bankbazaar and Paisabazaar.

(c) Applicable regulations and corresponding scores: They only help lenders to identify borrowers and digitise the application process and are not an intermediary like a lending platform. Therefore, these platforms are not regulated by the P2P NBFC framework.

*This category gets a total score of 0.*

xiv. **Hybrid Platforms**

(a) The fintech activity: Hybrid Platforms are common platforms for *selling* a range of financial instruments cutting across the different financial sectors and include products such as different types of credit products (credit cards, personal loans, education loans etc), insurance products (term life insurance, health insurance, car insurance etc) and investment instruments (mutual funds, fixed deposits, savings accounts). Hybrid Plaorms differ from other product aggregators such as Insurance Web-Aggregators discussed in the first category or the Credit Product Comparators in their ability to aggregate products from across different sectors.

(b) The typical business model: The typical business model varies with the financial product. A platform may be able to offer retail credit loans by acting as an agent of the bank, mutual funds after being authorised as MFD from AMFI and it can facilitate solicitation of insurance through the Insurance-Web Aggregators' license obtained from the IRDAI. Consequently, the revenue generated from each of the products will be in line with the model permitted by the relevant regulator. Some platforms also integrate the financial advice generated by an autonomous financial advisory unit or obtain an RIA or IN license from SEBI and offer financial advice to users, in curating a financial plan for themselves.

(c) Applicable regulations and corresponding scores: The consumer-facing dimension of the platforms remains unregulated. Most platforms are a composite front-end for different license-holding subsidiaries at the back-end. Therefore, there is no active financial regulation of the platforms.

*This category gets a score of 0*

## 5.1 Summarising the regulatory oversight applicable to the typology of consumer-facing fintech activities in India

The findings pertaining to the extent of regulatory oversight applicable to each type is summarized in Table 2.

TABLE 2: *Regulatory oversight applicable to consumer-facing fintech in India*

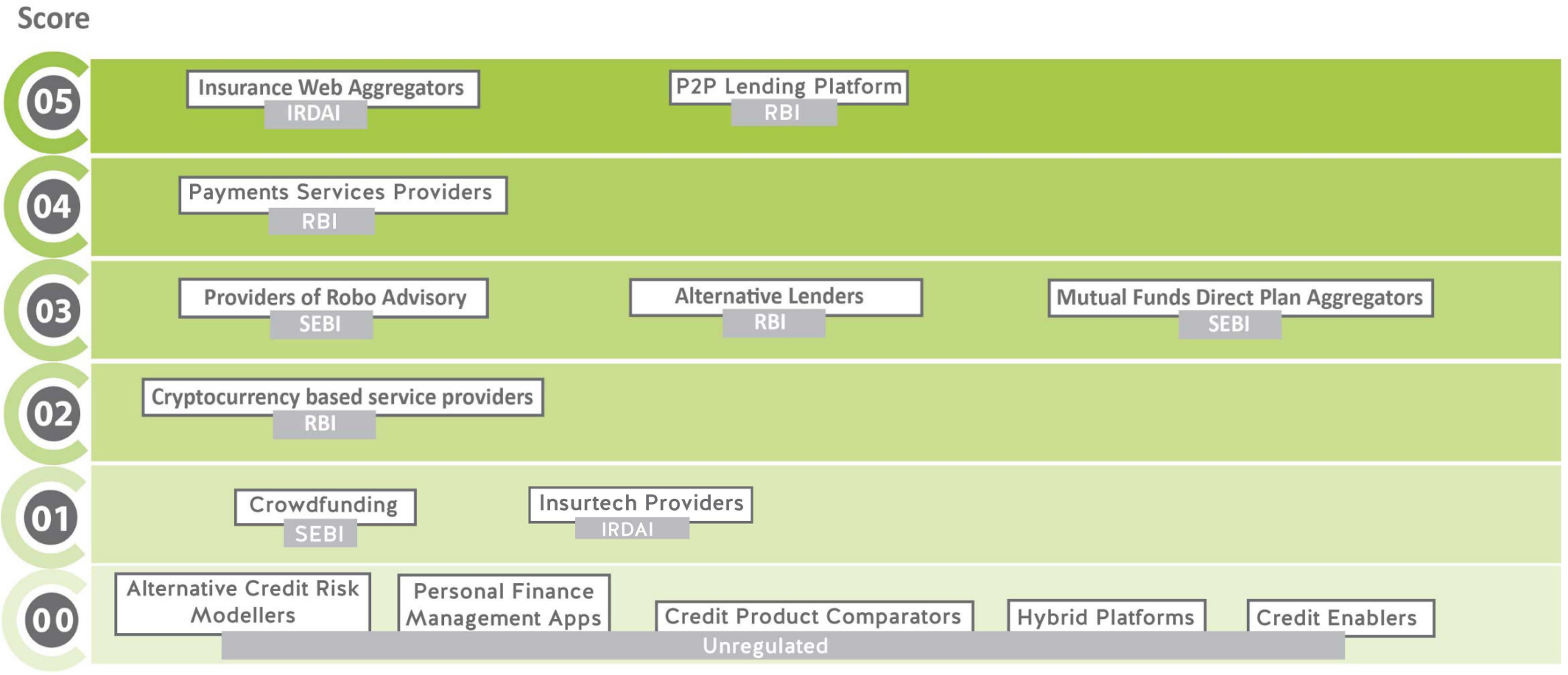
| Fintech Providers | Index of Regulatory Oversight | | | Score |
|---|---|---|---|---|
| | Identification of a regulator | Existence of active regulation | Extent of regulatory Oversight | |
| **Insurance Web- Aggregators** | 1 | 2 | 2 | **5** |
| **P2P Lending Platforms** | 1 | 2 | 2 | **5** |
| **Payments Services Providers** | 1 | 2 | 1 | **4** |
| **Alternative Lenders** | 1 | 1 | 1 | **3** |
| **Providers of Robo Advisory** | 1 | 1 | 1 | **3** |
| **Mutual Funds Direct Plan Aggregator** | 1 | 1 | 1 | **3** |
| **Cryptocurrency based service Providers** | 1 | 1 | 0 | **2** |
| **Insurtech Providers** | 1 | 0 | 0 | **1** |
| **Crowdfunding** | 1 | 0 | 0 | **1** |
| **Alternative credit-risk modelers** | 0 | 0 | 0 | **0** |
| **Credit Enablers** | 0 | 0 | 0 | **0** |
| **Credit Products Comparators** | 0 | 0 | 0 | **0** |
| **Personal Finance Management Apps** | 0 | 0 | 0 | **0** |
| **Hybrid Platforms** | 0 | 0 | 0 | **0** |

## 5.2 The regulatory landscape of consumer-facing fintech ac*ti*vi*ti*es in India

Figure 2 represents the regulatory landscape of consumer-facing fintech activities in India. This landscape represents the extent of financial regulation applicable to consumer-facing fintech activies in the country. The most tightly regulated activties are propped at the top of the chart, corresponding to the highest level of regulatory oversight. The extent of regulatory oversight reduces as we descend along the vertical bar. The swathe of unregulated activities is settled at the botto of the bar, corresponding to a score of zero.

This chart is an ordinal ranking of financial regulation, as is currently applicable to consumer-facing fintech activities in the country. It is not a qualitative commentary on the appropriateness, proporonality or the effectiveness of regulation. Further, because this is an ordinal ranking, the cardinal value of the score itself and the magnitude of difference between the scores are irrelevant.

Figure 2: Regulatory landscape of consumer-facing fintech activities in India.



# 6. Discussion

## 6.1 Features of the Indian regulatory stance

From the fintech landscape it appears that regulation tends to follow the emergence of fintech activity. Insurance Web-Aggregators such as Policybazaar came into existence as early as 2008, while their regulation came into existence only in 2017. Similarly, P2P Lenders preceded their regulation. It appears that payments is the only space where the regulator has been intentional about introducing technological innovations enabling the rise of fintech in the sector.

Some interesting features of the Indian regulatory stance become clear from the landscape:

1. *Fintech activities are increasingly gravitating towards platform economies:* At least five (Insurance Web Aggregator Platform, P2P Lending Platform, Crowdfunding Platforms, Credit Product Comparator Platform, Hybrid Platforms) of the 14 fintech activities are designed as platform-based business models. Platform-based business models exhibit network externalities i.e. a user's benefit from participating on one side of a platform (such as a seller on an e-commerce platform) increases with the number of users on the other side (such as buyers). Network externalities beget more users and more value for users (Bank for International Settlements, 2019).

2. *Fintech business models are becoming increasing modular:* Disintermediation is a natural consequence and even the *raison d'être* for the emergence of fintech. This modularity implies that the same function may be performed through various permutations and combinations of entities and processes. For instance, a person wanting a consumer loan could avail of any of the four providers --- (i) P2P Lenders, (ii) Alternative lenders, (iii) Credit Enablers and (iv) Credit Product Comparators. While this increases the choice set of providers available to the consumer, it is interesting to note the qualitative differences among their consumer protection regime. They may appear to be perfect substitutes in terms of the functions they perform but may offer very different protections to the consumers.

3. *Regulators still assume an institution-based approach to regulation, which leads to regulatory arbitrage:* Several instances of regulatory arbitrage, owing to institution-based regulation become evident in the spectrum. Insurance Web Aggregators which provide a platform to choose from various insurers' products are very tightly regulated with high paid-up capital requirements whereas Credit Product Comparators which perform the same function for credit products are not regulated at all. Another curious case is the difference between regulation of P2P Lending Platforms and Crowdfunding Platforms. Both raise similar concerns for the lender/investor- concerns around credibility of the borrower or business seeking investment, the riskiness of lending or investing and the uncertainty introduced by the sudden shut-down of the platform. While P2P Lending platforms are regulated for these risks, crowdfunding platforms are currently unregulated. In fact, crowdfunding platforms present a natural experiment for studying regulatory arbitrage and the friction created by institution-based approach to regulation.

Earlier this year, we witnessed leading Crowdfunding Platforms approaching SEBI to get registered as Alternative Investment Funds (AIF) (The Economic Times, 2019). This urgency to get recognised as an AIF stems from the need to prevent being categorised as a stock exchange by the regulator. However, many of the risks which apply to AIF do not apply to crowdfunding platforms that operate exclusively as intermediaries without any exposure to their balance sheet. This raises an interesting question for future financial regulation: *is the current financial sector regulatory toolkit sufficient to regulate for fintech?*

## 6.2 Is the current financial sector regulatory toolkit sufficient to regulate for fintech?

The theory of regulation for financial sector emphasises that financial sector regulation must intervene when the financial system, left to its own devices cannot solve for the problems of systemic stability and consumer protection (Government of India, 2013). The increasing modularisation, increasing adoption of platform economies and the limitation of institutions based regulatory approaches raise the question *does the financial sector have sufficient tools for regulating fintech?*

While the question merits a deep and exclusive research of its own to get a complete answer, some hints begin to surface from the current analysis itself. It appears that to effectively regulate fintech, the financial sector needs to add a few tools to its arsenal and recalibrate the framework for deploying the existing tools.

### 6.2.1 Refurbishing the financial sector regulatory toolkit:

New tools are needed to respond to the unique concerns which emerge when underlying technological business models interact with financial functions. For instance, dominant trend of adopting platform-based models for delivery of financial solutions may call for new regulatory tools. Platform economies exhibit ''network externalies'' i.e. as the returns on parcipating that accrue to each participant are directly related to the number of participants on the platform (Bank for International Settlements, 2019). As more people use a platform, it becomes more rewarding for them to use the platform. Two underlying factors explain this trend. As the number of participants on either side of the platform (i.e. demand and supply) increase, it reduces market frictions, search costs and the need to look elsewhere for fulfilling double coincidence of wants. Secondly, increased participation also implies an increased potential to gather data and insights which finetune the platform even further. This further increases the ability of the platform to match demand and supply, personalise products and services to match the users' needs. Moreover, this captive and ever-increasing dataset poses significant barriers to entry (Feld, 2019). New entrants do not have the benefit of the captive data, making it hard for them to compete with the incumbents on both scale and product innovation.

While these features are typical of any platform, they create unique concerns for consumers of finance and the financial system when they interact with the functions of finance themselves. Currently, platform-base models feature in delivery of financial services such as

credit product comparator platform and in performing function of finance such as in crowdfunding platforms Interaction of these function with the features of the platform economy raise concerns which maybe unprecedented, for financial sector regulators.

For instance, due to network effects, it is very easy for platform to become very large very quickly, leading to weakening of competition. In the space of product comparison and aggregation, suppliers can face very high cost of exclusion (Feld, 2019). By not including products of a certain insurer/bank/financial service provider, the dominant platform can skew the users' choice set while putting the excluded financial service provider at a disadvantage. Similarly, in the crowdfunding space, a platform may become too big too soon. In the absence of business continuity planning, a sudden shut down of the platform can cause concerns around stability of the system and create risks to investors' money. Moreover, as platform become big and receive a wide variety of users' data based on their consumption of finance, they also increase the risk to users' privacy and data protection. Cyber risks can become another challenge for both systemic stability and consumer protection (BCBS (Basel Committee on Banking Supervision), 2018).

Traditionall financial system has dealt with the problem of big institution by either increasing capital requirements or reducing the users' exposure to big institutions. However, in case of platforms, these instruments may fall short of affording protection to both the consumer and the system. For instance, capital requirements will offer little protection from cyber risks and artificially limiting the number of participant can create deadweight losses, considering the increasing returns to scale exhibited by platforms.

Regulatory tools to respond to the emergence of platform in finance need to be predicated on lessons from financial regulation, competition policy and data privacy regulation New regulatory tools to effectively manage platform are being deliberated across sectors, including e-commerce. Some of these new regulatory tools include data portability, including the right to delete data from one platform; encouraging open application programming interfaces (APIs) and interconnection; non-discrimination rules to avoid high costs of exclusion and; Privacy by Design to ensure users' data is protected (Feld, 2019).

## 6.3 Recalibrating the existing regulatory framework

The increasing disintermediation and modularisation of financial services has a bearing on the risks that these services generate across the value chain.

### 6.3.1 Implications for consumer protection

Increasing technological disintermediation also increases the dematerialisation of points of consumer regulation. The discontinuous technological disintermediation is creating gaps in consumer protection framework. For instance, most technological platforms act as intermediaries between the supply and demand side. These platforms might not themselves offer any financial solution, but they carry the huge risk of mis-sale. Most of these platforms use Arficial Intelligence and alternative data to map financial recommendations to consumers. They offer recommendations, when they cannot offer advice. They often offer the consumer a

bouquet of financial products to choose from, however the final decision and consequences of buying and selling the product rest on the consumer. This raises serious gaps in consumer protection by reinforcing the inferior standard of *caveat emptor*.

For instance, P2P Lending platform match borrower and lender and offer the interest rate at which the lending decision could be made. However, the consequences of taking the loan rest with the borrower and the credit risk is completely transferred to the lender. This goes on to furthering the caveat emptor approach to finance. At present the regulation addresses these concerns by relying on disclosures, limiting the exposure the lenders can take and prescribing minimum paid-up capital. This does little to protect either the borrower or the lender. For instance, the Master Guidelines on P2P NBFCs prescribe that the aggregate exposure of a lender to all borrowers at any point of time, across all P2Ps, shall be subject to a cap of ten lakhs (Secon 7(2), (RBI, 2018)) which offers little protection on a lender from credit risk to the sum of ten lakhs that has been invested. Therefore, the regulator needs to recalibrate their approach of capping exposure, prescribing permissible limits to investment and aspire for principle-based solutions instead. Considering that these platform are already undertaking alternative assessment of the borrower, regulation can seek them to apply similar tools to ensure that the product being offered is not unsuitable to the borrower and does not expose the lender to unreasonable credit risk. These measures could apply irrespective of the size of the loan and the sophiscation of the parcipants. Similar principles could be contemplated for all consumer-facing entities to protect the user from the risk of mis-sale.

### 6.3.2 Implications for function-based regulation

The regulation of functions and not institutions, has been the north star for financial sector regulators, globally. However, this principle needs to be fleshed out for nuances in the wake of increasing modularisation of financial services. The principle of one activity, one regulation implied that activities which have similar implications for both consumers and the system should be treated similarly, regardless of the underlying institution. In the case of consumer-facing fintech, a case can be made that regulators have to be sensitive to not just the function that is being performed but dig a level deeper and look at risks that the function entails. Table 3 puts together the different models of fintech credit currently active in the country and sets out some risks associated with them. From the table it is clear that even when entites perform the same function, generate similar risks, the incidence of risk differs. The following section briefly analysis the risks that fintech credit providers generate, the incidence of that risk and the appropriateness of the corresponding regulatory response.

When credit intermediaries generate credit risks, they are able to pass it on to different stakeholders. For instance, risk generated by P2P lenders is borne completely by the lender, while alternative scorers and credit enablers transfer it to the regulated entity, through contractual agreements. For mitigating this risk, the choice of policy instruments will vary significantly depending on who bears the incidence of risk. When the credit risk befalls a regulated entity, the regulator can strengthen outsourcing guidelines, call for closer monitoring or provisioning and tighter legal contract. The regulator may even decide not to regulate private contracts siting as a business model decision unless it posses a threat to systemic stability or consumer protection. However, the tools for protecting consumers will be different. Protection of consumers cannot be left to individual contracts they may require unsuitability assessments as discussed earlier. Therefore, regulation of fintech requires not only an understanding of the activity and the attendant risks but also the incidence of the risk.

TABLE 3: *Identifying incidence of risks across business models.*

| Associated Risks / Activity | Credit Risk | Leverage Risk | Cyber Risk | Risk of mis-sale | Any other consumer/ investor risk |
|---|---|---|---|---|---|
| P2P Lenders | Yes. While P2P lenders do match borrowers and lenders, they transfer all credit risk onto the lender. | No. Section 6 of the Master Directions prohibit P2P lenders from lending on their own (RBI, 2018). | Yes. P2P lenders use borrowers' personal data for due diligence and offer payments services, making them susceptible to cyber attacks. | Yes, risk of unsuitable sale. Most P2P lenders use algorithmic platforms to filter borrowers for each lender and quote the interest rate and tenure of the loan. | Yes. The risk raised by fly by the night operations. Other risks include procyclicality and tendency for credit standards to weaken during economic upswings. |
| *Regulatory Emphasis* | *No. The Master Directions require P2P lenders to undertake due diligence and credit assessment of borrowers on their platform and requires them to outline their credit assessment matrix. However, the caveat emptor approach prevails and the lender is responsible for their decision.* | *Yes. Despite prohibiting the exposure to balance sheet, the Master Directions also prescribe a maximum leverage ratio of 2.* | *Yes. The Master Directions require Information System Audits of internal processes by a CISA certified auditor.* | *No. While most algorithms narrow down prospective borrowers and decide interest rates, they do not hold any responsibility for the decisions that lenders make.* | *Yes. P2P lenders are required to have business continuity plans, should the platform shut. The minimum paid-up capital for P2P Lenders is 20 million.* |
| Alternative Lenders | Yes. Credit risk in alternative lending is a function of the robustness of the underlying algorithmic model | Yes. | Yes. | Yes, risk of unsuitable sale. | Yes, risk of potential bias and discrimatioon due to the use of alternative data. |
| *Regulatory emphasis* (Derived from regulations applicable to NBFCs and Banks. alternative lenders are not distinctly regulated in the country) | *The RBI issues Guidance on Credit Risk Management, for regulated entities (Reserve Bank of India, 2002).* | *The RBI prescribes the leverage ratio to regulated entities* | *Yes, the RBI contemplates a comprehensive Information Technology Framework for the NBFC Sector (Reserve Bank of India, 2017).* | *No. Though the RBI has put in place a charter of customer rights for bank users, which recognises a right to suitability, it is not binding in nature (Reserve Bank of India, 2014). and the Fair Practice Code for NBFCs (Reserve Bank of India, 2015), does not require them to practice suitability.* | *Yes. As part of the Fair Practices Code, NBFCs confirm to non-discriminatory policies.* |
| Credit Enablers | They induce credit risk but transfer it to the lending institution. | No. | Yes. | Yes. Risk of unsuitable sale since they match borrowers and lenders using AI. | |
| *Regulatory Emphasis* | *Regulated via lending institutions.* | *No.* | *No, the risk is transferred to the regulated entity.* | *No, the burden is transferred to the regulated entities.* | |
| Alternative Credit Risk Modellers | Yes. They transfer it to lending institutions. | No. | Yes. | Yes. They rely on lead generation models to orginate borrowers and send their creditworthiness assessments to regulated entities. | |

| | | | | | |
|---|---|---|---|---|---|
| *Regulatory Emphasis* | *No.* | *No.* | *No, regulated via out-sourcing guidelines.* | *No, regulated via regulated entities, where such regulations exist.* | |
| Credit Product Compara-tors | No. | No. | Yes. | Yes. | |
| *Regulatory Emphasis* | *No* | *No.* | *No.* | *No, regulated via regulated entities where such regulations exist.* | |

# 7. Conclusion

This paper attempts a coherent understanding of the fintech landscape in India by constructing a typology of fintech activities that are prevalent in the country and analysing the extent of financial regulation applicable to it. The paper also converts the qualitative understanding of the extant regulatory regime into crude, ordinal scores and ranks fintech activities along a regulatory spectrum. The activities organized from the highest regulated to unregulated offer a snapshot of the fintech landscape in the country. The analysis of the study shows that regulation almost always follows fintech innovations. Consumer-facing fintech innovations are steadily gravitating towards platform-based business models. To respond to this appropriately, the regulator may have to refurbish the regulatory toolkit to deal with issues raised by platform economies due to their network effects. Similarly, the data intensive nature of these activities may make them more amenable to data-driven regulation for instance conducting unsuitability analysis of products. These regulatory tools offer sophiscated substitutes to the blunt and traditional tools of artificially limiting the exposure of consumers to these products and are more amenable to the underlying businesses of these providers. Finally, in addition to function-based regulation which is sensitive to the risks that are induced by a particular activity , effective regulation of fintech will also benefit from a clear understanding of incidence of the risk. The tools used to regulate these risks should be effective and efficient vis-à-vis the entity bearing the risk.

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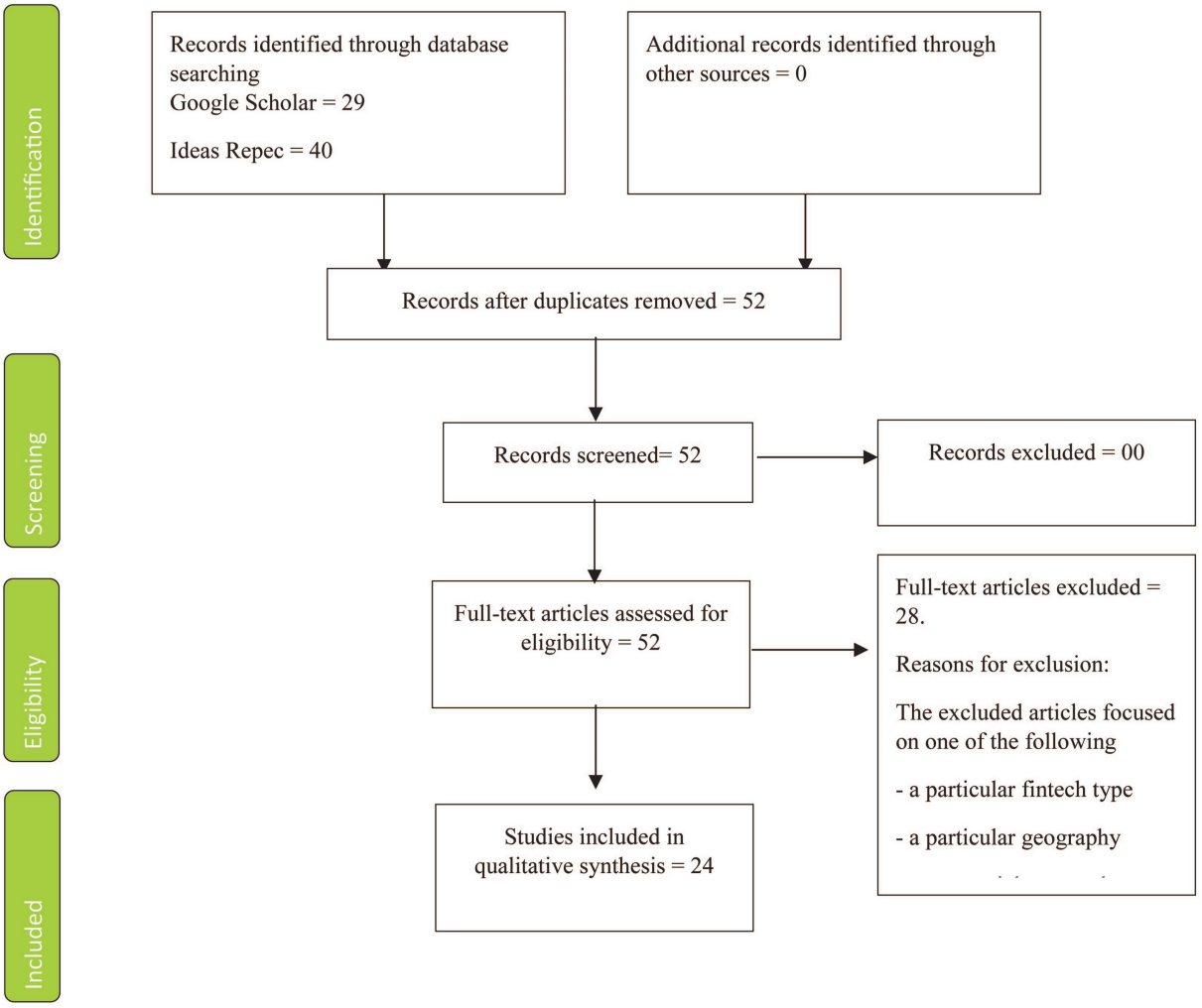
# Annexure 1 - Criteria for selecting literature: The application of the PRISMA framework

FIGURE A 1: Graphical representation of selection criteria applied for the literature review.



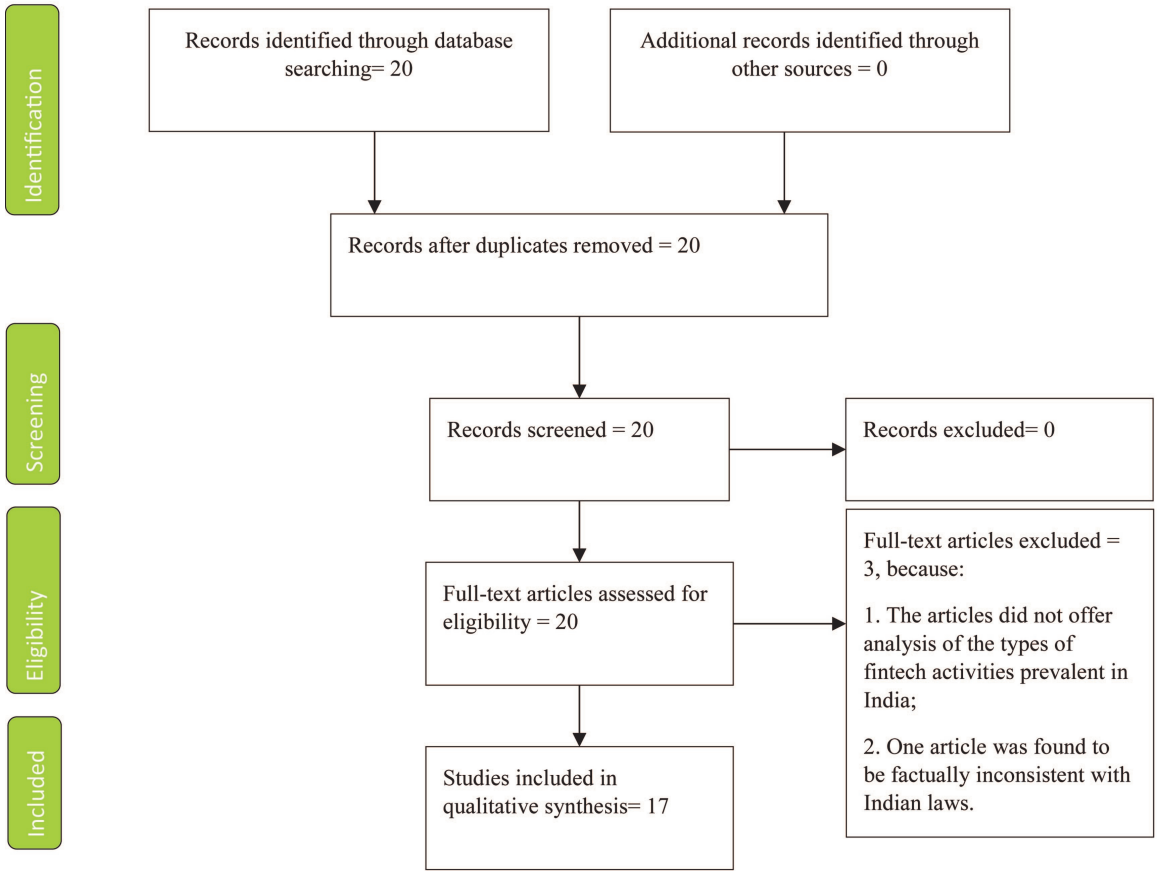

PRISMA 2009 Flow Diagram. Source: Moher D, Libera. A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporng Items for Systemac Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097. Adapted for the authors' research

# Annexure 2 - Table A-1: List of non-academic publications analysed for creating fintech-typology

| Sr. No. | Title of the Report | Affiliation |
|---|---|---|
| 1. | Indian Fintech Products: Innovation Driving Growth | NASSCOM |
| 2. | Fintech India Landscape | Traxcn Research |
| 3. | Fintech in India | Swissnex |
| 4. | India Financials Sector | Credit Suisse |
| 5. | Digital Payments 2020 | BCG |
| 6. | Fintech: Redefining banking for customers | PWC/CII |
| 7. | FinTech India: Genesis | MXV Consulng |
| 8. | Fintech and the evolving landscape: landing points for the industry | Accenture |
| 9. | FinTech APAC Landscape Developments | PWC |
| 10. | Fintech India: A Rising Economic Force Expects A Dynamic Commerce Experience | ACI |
| 11. | Inclusive Growth with Disruptive Innovations | BCG |
| 12. | AlternativeLending Landscape Report | Traxcn Research |
| 13. | Future of Fintech in India: Opportunities and Challenges | IndiaBriefing |
| 14. | Fintech in India: Ready for Breakout | Deloitte |
| 15. | The Battle for the Indian Consumer | EY |
| 16. | Fintech in India: Powering a Digital Economy | NASSCOM - KPMG |
| 17. | Fintech in India: An Analysis of the Market and the UK's Role in Supporting its Developments | Nathan Associates |
| 18 | Report of the Inter-Regulatory Working Group on FinTech and Digital Banking in India | Reserve Bank of India |

# Annexure 3: Filtration process applied to idenfy publications relevant for constructing the typology of consumer-facing fin-tech in India

Figure A 2: Graphical representation of selection criteria applied for the identifying non-academic publications for constructing the fintech-typology.




PRISMA 2009 Flow Diagram. Source: Moher D, Libera A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporng Items for Systemac Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097. Adapted for the authors' research.

The stages of filtration process are set out below:

In stage 1 of the analysis, the fintech activities referred to in these publications were thematically analysed and similar and same activities were clustered. Some activities were referred to by different names across publications. In such instances, nomenclature was standardised by referring to nomenclature contained in regulations in cases where they existed or by referring to the global parlance.

Stage 2 of the analysis focused on understanding the exact business models underlying these fintech activities. This step relied heavily on intense desk research across resources including financial press reportage, websites such as the Crunchbase and Traxcn and the websites of the financial service providers. These business models were triangulated by referencing back to academic literature where it existed.

In Stage 3, these business models were mapped on to the standard typology of financial services as laid out by the Financial Stability Board (FSB). The FSB recognises five categories of financial services (i) payments, clearing and settlement; (ii) deposits, lending and capital raising; (iii) insurance; (iv) investment management; and (v) market support (for consumers) (Financial Stability Board, 2017). Through this exercise, the business models were tied back to the function of finance being provided. For instance, the use of algorithms for credit decision-making was mapped on to the category of '*deposits, lending and capital raising',* while the use of algorithmic decision making to offer investment advice was mapped to the category *'investment management'.*

# Annexure 4: List of abbreviations

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| AMFI | Association of Mutual Funds in India |
| DLT | Distributed Ledger Technology |
| RE | Regulated Enty |
| NBFC | Non-Banking Financial Company |
| SEBI | Securities and Exchange Board of India |
| IRDAI | Insurance Regulatory and Development Authority of India |
| FSP | Financial Service Provider |
| ICT | Information and Communication Technology |
| FSB | Financial Stability Board |
| RBI | Reserve Bank of India |
| PSO | Payments System Operator |
| RIA | Registered Investment Advisers |
| NPCI | National Payments Council of India |
| P2P | Peer to Peer |
| PSSA | Payments and Settlement Systems Act |