

# How the agent-based banking model might facilitate financial inclusion and sustainability via economic circularity? – A Bangladesh perspective

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## Abstract

Transformation of business models with the interaction of technological breakthrough, innovation and socio-economic transition are historical. Context based adjustment of business value chain also not rare. In fact, such adjustment might prove essential to survive in the market at certain point, especially in case of corporate transformation due to economic recession/depression, industry downturn and ecological correction like COVID-19. However, some business models are smart enough to cope with both kinds of transformations. Agent-based Banking Model (ABM) is one of such kind, which not only sustains during adverse situation but also facilitates the momentum of adversity. This ultimately defined as a sustainable innovation in banking industry that drives via circular economy. The mode of circular economy in product and service level or goods and service industry are not identical and while articulating circular business model in service industry, like Banking, then it denotes generating values for broader range of stakeholders and transmitting this value in such a way that minimize the ecological and social costs. How ABM might help the conventional banks of developing countries like Bangladesh toward the business model sustainability, is the centre of this study. Consequently, this study found that ABM would not only assist to bring the World's 1.7 billion unbanked adult community into regulated financial system but also facilitate the physically challenged, illiterate & marginal people on financial inclusion and pave the way of global development in a sustainable manner.

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**Keywords:** Agent-based banking model; Circular economy; Financial inclusion; Sustainability; Transformation

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## 1. Introduction

In this dynamic World, transformation of business processes to behave in a sustainable manner is becoming inevitable as the business entities are no longer an isolated part of economic, social and environmental ecosystem (Bermúdez and Schneider, 2018). Therefore, converting traditional business model into circular one is now trending. What is circular business model? The essence of circular business model lies on the circular economy. According to Ellen MacArthur Foundation, “*Circular economy focus on resource use often follow the 3-R approaches, (a) Reduce – minimum use of raw materials, (b) Reuse – maximum reuse of products/components and (c) Recycle – high quality reuse of raw materials*”. Adoption or conversion into circular model rapidly gaining importance among business acumen as scientists/researchers have made significant progress on pricing the externalities (Andersen, 2007), which will apply over the corporate actions. Embracing the concept of circular economy as the driver for sustainability (Bocken et al., 2018) could facilitate this transformation. Even though businesses dealing with commodity market counting the adoption of circular business model as challenging, from environmental and policy perspectives. Korhonen et al. (2018) found circular economy as vague and unorganized concept due its undefined application in specific field and there is an ambiguity at the tangent point between circular economy and sustainability (Geissdoerfer et al., 2017). Investopedia defined sustainability as “*focusing on meeting the needs of the present without compromising the ability of future generations to meet their needs*”.

Until now, circular business model in service industries might be the most neglected part of the circular economy. We should not confuse the service of a product by counting as service level circular economy like buying the lifetime or service hours of a ‘Refrigerator’ not the ‘Refrigerator’ itself. However, incorporating this concept into service industries like Banking, Insurance etc. might be vastly beneficiary for the society and economy at large. It will enable the service providers to cover broader range of populations under respective service network

with minimum ecological and social cost. Among the service industries, financial or banking industry is the strategic one, which is in acute sustainability pressure (Bocken et al., 2016). This is due to high correlation of banking industry with macroeconomics (Athanasoglou et al., 2008; Drake et al., 2006), geo-political incidents and other sensible issues like pandemic. Incorporating the concept of circular economy within banking industry is almost essential, not only for de-risking its extreme domino effects over the society, economy and environment but also for covering the nearly 1.7 billion<sup>1</sup> unbanked bankable community into the network of regulated financial system. In addition, the term ‘Circular Economy’ is no more an acute environmental action as it emerged, rather an economic strategy (Yean et al., 2008) that will assist the economy to become sustainable and resilient.

However, with the blessing to technological advancements, the inception of mobile banking or m-banking services from the beginning of 21st century is not less than a revolution in global financial industry. This inception has significant positive effect over the financial inclusion (Siddik et al., 2014), especially in underdeveloped and developing countries. M-banking not only facilitated unbanked populations but also enhanced the efficiency of other existing financial service providers, including conventional banks and microfinance institutions (Shaikh and Karjaluo, 2015). This ultimately helped most of them to formulate ‘FinTech’ entity as sister concern or strategic wing of mother company, e.g. the ‘bKash’ of BRAC Bank in Bangladesh. Beside this, quick adoption of digital finance by tech-giants like Tencent, Alibaba, Apple, Google etc, leaved aggressive footprint of ‘TechFin’. This TechFin booted the way of financial inclusion with a big jump by facilitating ‘Platform Economy’, especially at the beginning of second decade of this century. The difference between ‘FinTech’ and ‘TechFin’ is coincide. When a financial institution embrace technology for better client services is called ‘FinTech’, like ‘bKash’ and when a technology firm enters into financial industry is called ‘TechFin’, like ‘Alipay’.

Though m-banking is a handy tool of covering marginal community under banking network but due to security, technical, financial literacy, infrastructure and related issues, this mechanism couldn’t provide full-fledge banking coverage and failed to meet the growth prospects. As a result, m-banking is accounted for just around 5% of total bank accounts in India (Bhatt and Bhatt, 2016), the second most populous country of the world. Beside this, m-

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<sup>1</sup> <https://globalfindex.worldbank.org/>

banking is highly expensive compare to the financial condition of marginal community. For example, 'bKash', the first and popular mobile banking service provider in Bangladesh, which incurs at least 1.75% charge for cash out from the virtual wallet. This is excessively high for any paper (money) based economy where most of the payments have to make through physical currency.

Providing banking services in remote areas with low service cost and customer friendly way might be an effective mechanism of covering the huge amount of unbanked community. This community are mostly marginal people with little or no financial literacy and residing in underdeveloped and developing countries. Agent-based Banking Model (ABM) may do this optimally by covering wider range of stakeholders with low economic and social cost as the essence of such model is circular economy. Therefore, transforming existing brick and mortar type or linear banking system into circular one is demanding and somehow required.

However, aim of this study is to investigate the impact of Agent-based Banking Model and how it might facilitates the marginal community toward financial inclusion? To do so, this paper will follow by its background. Methodology of this study presented at section 3. Section 4 highlighted the existing linear business model of Banks functioning in developing countries like Bangladesh. Pictograph of ABM with its explanation, application and limitation presented at section 5. Qualitative aspects of this study presented afterward and further wrapped-up by concluding remarks.

## 2. Background

To understand the status of global financial inclusion gap, the 'Global Financial Inclusion (Global Findex) database'<sup>2</sup> published in 2017 by the World Bank Group is absolutely good enough. Still, a brief flavour on this would help to realize the importance of fulfilling financial inclusion gap and identify the potential scope of contributing from socio-economic &/or environmental perspectives.

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<sup>2</sup> [https://globalfindex.worldbank.org/sites/globalfindex/files/2018-04/2017%20Findex%20full%20report\\_0.pdf](https://globalfindex.worldbank.org/sites/globalfindex/files/2018-04/2017%20Findex%20full%20report_0.pdf)

Figure 1: Demographics of World's 1.7 billion unbanked communities



Data source: Chapter 2, Global Findex Full Report 2017

According to World Bank's report, there are about 1.7 billion adult unbanked community globally. The unbanked means, they do not have a bank account or account with mobile money service. This report also claimed that, literally almost all of the global unbanked community lives in developing countries and nearly half of them belongs to seven countries only. Global technological super-power, the People's Republic of

China<sup>3</sup> hosting most of the unbanked adult population of the world. Therefore, sometimes technology may need to compromise with the context. For example, in the year 2018 due to digitalization of banking system, volume of net closing<sup>4</sup> of branches by Banks & Thrifts in the United States of America (USA) was 1,947 units, whereas in Bangladesh, banks opened 393 sub-branches<sup>5</sup> last year (2019). So, the context relevancy is very important rather than jumping into technology blindly. If that prevailed true than many banks of developing countries may become 100% digital, may be with the help of different global platforms like 'Deloitte Digital Bank Accelerator'<sup>6</sup> and could fill the vacuum of financial inclusion. Poverty, illiteracy and disability are the key obstacles of financial inclusion. Mechanism of agent-based banking model might facilitates illiterate, physically challenged and remote communities by leveraging

<sup>3</sup>[https://globalfindex.worldbank.org/sites/globalfindex/files/chapters/2017%20Findex%20full%20report\\_chapter2.pdf](https://globalfindex.worldbank.org/sites/globalfindex/files/chapters/2017%20Findex%20full%20report_chapter2.pdf)

<sup>4</sup><https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/49360224>

<sup>5</sup><https://www.dhakatribune.com/business/banks/2020/01/12/sub-branch-opens-up-new-portal-to-banking>

<sup>6</sup><https://www2.deloitte.com/global/en/pages/technology/articles/deloitte-digital-bank-salesforce.html>

existing technology and know-how. But the real challenge is poverty, which is further worsening with the interaction of COVID-19. World Bank estimate that COVID-19 might push 71 to 100 million<sup>7</sup> people into extreme poverty, globally. High financial inclusion may shed light on this, as it will prove that financial inclusion enhances the fund's mobility and leads toward productive investment that ultimately yield socio-economic development and reduce poverty.

### 3. Methodology

This is an exploratory research with thematic inclusion, where focus group interviews conducted in an unstructured manner to collect primary data. About hundred people asked for interview during February to April 2020, in the Chittagong region of Bangladesh, from which 63 person agreed to be respondent. Respondents are mostly male adult, whom are either existing clients (minority) of the Bank or officials (majority) working at the Banks. Respondents affiliated with the NCC Bank, One Bank, NRB Global Bank, First Security Islami Bank are branch level participants and respondents affiliated with Mutual Trust Bank, Dutch-Bangla Bank & Bank Asia Limited are the agent level participants. Respondent's orientation better described at the qualitative aspects section of this paper. Collected primary data extensively contributed to offset the key research query. These data also helped to find a substitute/supplementary business model for brick & mortar type banks that are hyperactive in underdeveloped and developing countries e.g. Bangladesh. This study used quantifiable data, gathered from plausible secondary sources, for better understanding the current scenario of formal financial inclusion gap that prevails mostly in emerging countries.

#### 3.1 Research question

How to incorporate marginal community into formal banking system and boost financial inclusion?

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<sup>7</sup> <https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty>

#### 4. Linear business model of banks in developing countries

By examining the primary data gained from branch level officials of different leading commercial banks in Bangladesh, it found that the existing business model of most of the commercial banks that operating in developing countries are kind of liner. This can be understand from their function pictograph plotted at figure 2. Nevertheless, many of those banks quickly coped with the trend of technological development. They have been adopting internet banking, real time transaction booking, inter & intra bank fund transfer, mobile application based banking service, online bank account opening, mobile banking division, SMS banking, ATM (Automated Teller Machine), CDM (Cash Deposit Machine), e-statement, POS (Point Of Sale) based cash withdraw facility, Plastic/Chip card based operation, storing data into the cloud and many more. To embrace those sorts of advance technology and facilities, operation cost of the banks reached at the pick where intention should be the gain of cost efficiency by embracing technology. Beside this, their brick and mortar type business model enhanced the maintenance cost significantly. To bear the lavish operation and maintenance cost, such banks have to charge the customers via different known and unknown means like SMS banking charge, half-yearly account maintenance charge, charge on cheque books, ATM cards, bank statement, online transaction, clearings and so on. As a result, availing banking services has become expensive which is discouraging people from financial inclusion.

Figure 1: Pictograph of Conventional business model of banks in developing countries



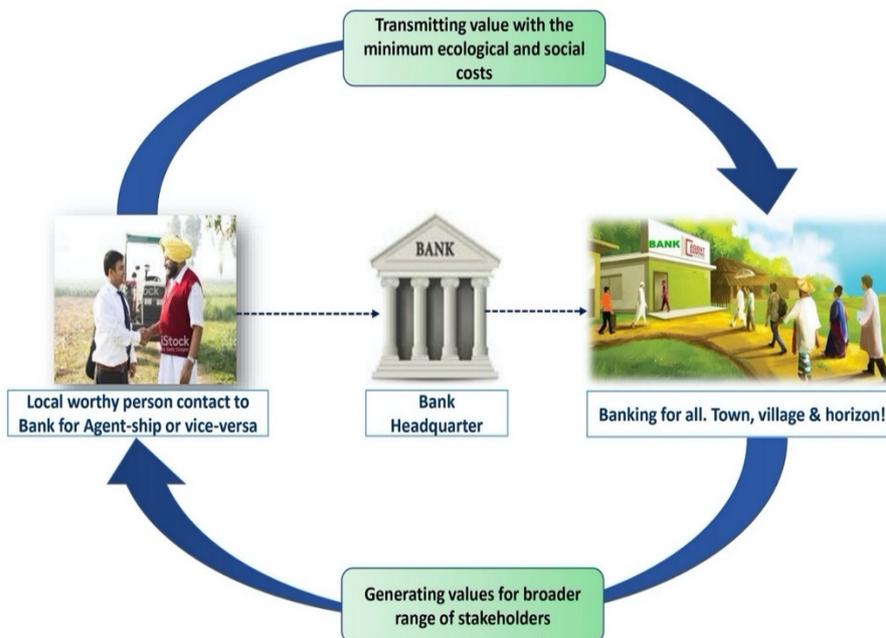
Source – developed by the authors

## 4.1 Mechanism of linear business model of banks in developing countries

As explained by the respondents, whose are the officials at branch level of different leading commercial banks, functioning process of Bank’s branch start form the head/corporate office. With the objective of expanding business, bank’s head office looks for potential commercial areas. After assessing the tentative business case, they generally rent an office space at the prime location of that particular commercial area which is logically expensive. Bank spends huge amount of money on its decoration, furniture and fixture, air conditioning etc. Then the bank employs personnel for providing services. Those personnel are mostly migrated from different parts of the country, who needs accommodation in nearby town. Through this way, respective banks provide financial intermediary services that incurs high amount of fixed and operation cost. Pictograph of such a model of banking is highlighted above via ‘Figure – 2’, for the better understanding.

## 5. Agent-based banking model

Figure 3: Agent-based Banking Model



Source – developed by the authors

## *5.1 Brief explanation of Agent-based Banking model*

In light with the objectives of circular economy, the agent-based banking model might transform the linear business model of conventional banks dramatically. As learned from the respondents affiliated with agent banking operations (Officials and Customers), the operating model of agent-based banking is very handy but technology dependent. Their opinions sketched, visualized and presented at figure – 3. Apparently, first of all locally competent person or entity approach to a bank for setting up a banking service centre with tentative social-business case, where conventionally banks look for potential markets and service location. Bank then review the proposal, which covers demographics and socio-economic condition of that particular region and the competency of the proposer. If the proposal fits with the bank's pre-specified criteria than it nominates the proposer as bank's local agent and asked the agent to set-up a friendly structure to provide banking services. In that case, banks generally provide technical supports and train the recruited staffs of agent, whose are mostly from local community. Through this mechanism employee migration reduces significantly, which means lower movement, better cultural affinity, better utilization of indigenous human resources, balanced development and many more. Off course bank needs to employ experienced staff for smooth operation of banking services until the locally recruited persons/agent become capable to serve the front office clients properly. Respective agent deploys his/her local reputation/network and the brand value of the bank, which ultimately serve the local community and brings them under formal or regulated financial system. This system incurs minimum ecological, social and operation cost than the linear service model of conventional banks. It enhances the service network of banking system that capable to serve all level of community from rich to ultra-poor. Eventually this builds a banking service model for the customers by the customer.

## *5.2 Mechanism of the core banking service under agent-based model*

Technological advancement blessed the conventional banks to adopt agent-based banking system, which not only help them to expand their coverage significantly without significant investment but also making their business model sustainable and resilient. Here is how?

Bank ask the appointed local agent to deposit certain amount in his/her mother or agent account with the respective bank. Upon receipt of deposit from customer through secure

computer-based transaction system, agent account debited (deducted) with the equivalent amount as credited (added) to the client's account. Similarly withdraw transaction booked for the drawings by client, that is, client account debited (deducted) with the equivalent amount credited (added) to agent account. For the safety of customer's fund, respective agent is not entitled to receive deposit from the clients exceeding the amount of his/her mother account and for such attempt, system will automatically reject the transaction. Transaction request will be authenticate by the biometric fingerprint of the respective client and agent/bank officials. This method is secure, cost efficient and environment friendly, due to no requirement of printing the 'Cheque'. Such assured form of transaction through biometric authentication is very effective and somehow essential for illiterate and physically challenged community. Those people are not capable to put signatures on paper, which protesting them from formal financial inclusion. Let us see an illustration on how the agent-based banking model facilitates the physically challenged community on formal banking inclusion;

Figure 4: Convenient banking inclusion of physically challenged community



Source: <https://www.bayometric.com/nitgen-fingkey-hamster-ii-dx-usb-fingerprint-scanner/>

According to World Health Organization, about 10% of global population are experiencing disability<sup>8</sup> and approximately 15% or 1 billion World's population lives with at least some sort

<sup>8</sup> [https://www.who.int/disabilities/world\\_report/2011/report/en/](https://www.who.int/disabilities/world_report/2011/report/en/)

of disabilities<sup>9</sup>. There is no such appropriate data available (at least I failed to find) about what percent of disable community are formally unbanked but there is a strong positive correlation among the poverty, disability and non-banking. Financial condition of most of the disable people that belongs to developing and underdeveloped countries are poor to ultra-poor<sup>10</sup>. However, bringing physically challenged people under social safety net is an on-going process globally. This require their formal financial inclusion not only for ensuring transparency in disbursement but also for truly empowering them financially with a real flavour.

Take the case of Mr. Mojaharul Hoque from Chittagong, a physically challenged freedom fighter of liberation war of Bangladesh and ex-policeman who got severe disability from war. He is entitled to receive the freedom fighter's allowance and pension from police fund but has to make another struggle for collecting his allowance and pension. The conventional brick and mortar type banking system of Bangladesh is responsible for worsening his sufferings; where in every month he has to travel to Upazilla-sadar (sub-urban area) where bank located, for proving his aliveness and receiving the pension.

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<sup>9</sup> <https://www.worldbank.org/en/topic/disability>

<sup>10</sup> <https://www.un.org/esa/socdev/enable/diswpa04.htm>

Figure 5: Photography of Mr. Mojaharul Hoque from Chittagong



Source: Author

However, with the agent-based banking model, disable and physically challenged people may get banking service easily from their home or nearby. This will reduce the cost of availing banking services, eliminate harassments & difficulties on financial inclusion. This might also ensure the transparency of the transactions and government's disbursement of social benefits to underprivileged, aged/retired, physically challenged and related communities.

### *5.3 Applicability of the model*

Agent-based model is in practice in many underdeveloped and developing countries (Chude and Chude, 2014; Chiteli, 2013) of the world, which generating huge social, economic and environmental positive impact there. Along with hitting triple-bottom-line, this mechanism may serve the special group of the society that is the physically challenged community. It might work as a handy weapon of eliminating inertia of illiterate people on formal financial inclusion. It will also enhance the indigenous fund mobilization via remote banking network and stimulate savings tendency of marginal inhabitants. This will ultimately lead toward the productive

investment and balanced development. Very specific challenges of brick & mortar type banking system that might be address by the agent-based banking model are;

- Existing high fixed & operation cost of spreading banking network might be reduce significantly.
- Way of incorporating illiterate and physically challenged community under formal financial system will be smoothen.
- Environmental footprint from banking industry of developing countries like Bangladesh, will be minimize notably especially through non-use of paper cheque, less employee migration, sustainable physical structure of service station and so on.
- Formal financial inclusion of marginal and remote community will increase and their savings propensity will stimulate accordingly.

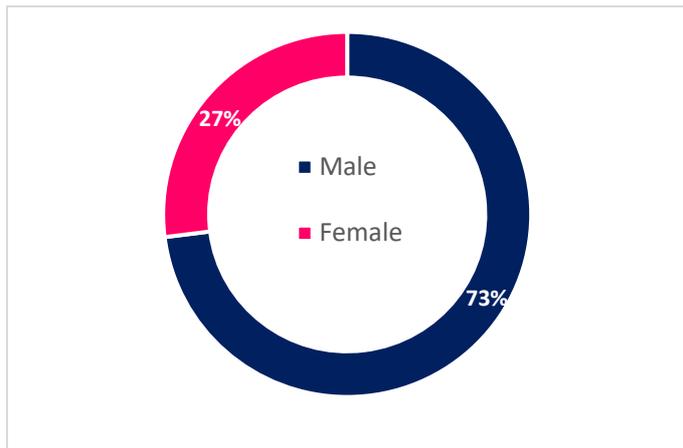
#### *5.4 Limitations of the agent-based banking model*

Functioning of the agent-based banking model might be limited on the several grounds. Availability of Electricity and IT infrastructure or internet coverage of the respective territory, which did not considered in this model. The issue of grid power might be resolved through solar panel in remote areas but the internet connectivity might a matter of concern. If internet providing mobile network is not available in remote areas than providing banking service there under such model will not be possible. Operation cost of that sort of banking model is subject to the cost of internet data and power as well. Finding the literally and financially eligible and interested local service provider or agent in remote areas might be difficult.

## 6. Qualitative aspects of the study

### 6.1 Respondent's orientation

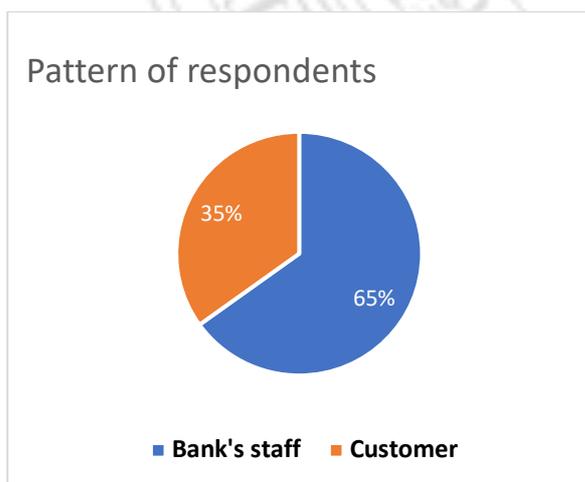
Figure 6: Respondent's orientation in terms of gender



Source – developed by the authors

In terms of the gender differentiation, 73% of total respondents are male and remaining are female. Reason behind this imparity might be the women are less likely to participate in survey.

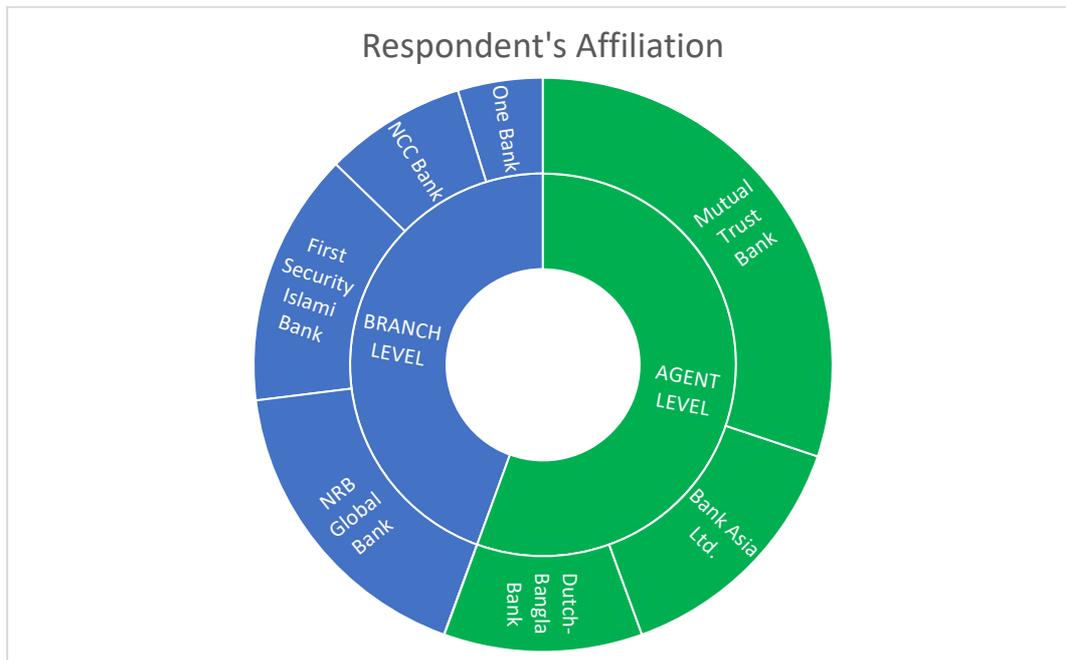
Figure 7: Pattern of respondents



Source – developed by the authors

About one-third of the respondents are the existing customers of the bank and 65% from the bank officials, either from Agent-banking or conventional banks. This is quite fruitful as the staffs of banks are better familiar with their business model.

Figure 8: Respondent's affiliation



Source – developed by the authors

Respondent's affiliation is an important factor regarding the relevancy and quality of data. Within collected samples, 56% respondents affiliated with agent banking service of three banks and remaining 44% affiliated with branch-level operations of four commercial banks. More than 30% of total data gathered from the respondents affiliated with Mutual Trust Bank, which is the highest single source. It followed by NRB Global Bank, Bank Asia Limited, First Security Islami Bank and Dutch-Bangla Bank, where they are accounted from more than 10% each. Respondents affiliated with NCC Bank accounted for 8% and One Bank accounted from 5% of respective data.

### *6.2 Respondent's opinion (Selected)*

“Agent banking wing of our bank is one of the finest additions. It growing very rapidly and serving the remote community. Agent banking centres are working like social enterprises with very minimum ecological footprint. With the inception of about four years, our agent-banking network surpassed the branch network. The strategic implication of such banking model is really wide. Regarding this new-normal situation resulting from COVID-19, this is absolutely fit. People need not to crowd in the branches that means less travelling, less chance to be infected or spreading the corona virus. In certain cases, agents provided banking services at the doorstep of needed clients. So, I found this model is very handy and as a head of agent banking department at one of the country's leading private commercial bank, I would describe this as a silver bullet toward the financial inclusion of rural population of Bangladesh”.

Mr. Madan Mahan Karmakar,  
Senior Executive Vice-President & Head of Agent Banking Department  
Mutual Trust Bank Limited

“I believe agent-banking is an innovative solution in the entire banking system but it's definitely not a substitute of regular branch banking. Our bank still not introduced this model but very much positive about this as it incurs very low cost of spreading service network”.

Mr. Forkan Ali,  
Operation Head,  
NRB Global Bank Limited, Narayanhat Branch.

“Agent banking is a strategic supplementary to retail banking. In Bangladesh, I see the future of retail banking moving toward agent and/or online banking”.

Mr. Md. Saiful Islam,  
Junior Officer,  
First Security Islami Bank Limited, Hathazari Branch.

“Rural people once used to engage with NGOs and Cooperative societies for their savings endeavour where the risk of deception was very high. They also need to travel a lot to avail core-banking services. With the introduction of agent banking, those people might get the banking service at the nearby with safety and security”.

Mr. Md. Mamunur Rashid Chowdhury

Customer Service Executive

Mutual Trust Bank Limited, East Kalurghat Agent Banking Centre.

## 7. Conclusion

The role of banking system in wider areas of capital formation, investment and economic development is unanimously recognized. Unfortunately, in this technologically advanced World, approximately 22.58% of global adult population still out of regulated financial system and most of this unbanked community belongs to emerging economies. To bring those unbanked communities into formal banking system, agent-based banking model might be an efficient tool. This tool contains the basic traits of circular economy, where circular business model in service industry covers wider range of clients/customers with optimum costing from social, economic and environmental perspectives. However, this study prudently identified several latent constrains toward formal financial inclusion and flagged following issues;

- By leveraging existing technology, knowledge and expertise, applying a circular business model for brick and mortar type banks is very much feasible.
- There is enough scope of bringing physically challenged, disable, illiterate and remote community under formal financial system. Utilizing those scopes will not only enhance the propensity of financial inclusion but also stimulate transparency and good governance in the concerning regions.
- High fixed investment, high operating cost and employee migration related with spreading banking network by conventional commercial banks may be reduce significantly through the adoption of agent-based banking model.
- There is a huge potential to lure marginal community into regulated financial system without significant investment and ensuring affordable banking services for them is very much viable.

Essence this study based on the primary data of particular region of Bangladesh and the data from particular area might not represent the entire universe. Therefore, the effort of this study might be limited on this ground. Small sample size might be another limitation of this study. Still, it might be interesting for potential researchers on further development of existing ABM and the context based adjustment of ABM, since the status of prerequisites of this model are not identical in every country or county, especially internet facility.

Considering the current pandemic situation, the devastating effects of COVID-19 is leaving aggressive footprint almost in every industry. These effects further intensified at the banking industry owing its high correlation with different industries. In this complex situation as survival strategy, many private commercial banks in Bangladesh have been clipping their workforce and several other banks reduced their salary-base instead of retrenchment, media reported<sup>11</sup>. Outcome of this study might act as a policy feed for the conventional commercial banks in developing countries, like Bangladesh, whom are looking for sustainable transformation of existing business model.

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<sup>11</sup> <https://en.prothomalo.com/business/local/fear-of-losing-jobs-salary-cut-in-banks>

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