A Matrix Study between Fintech and Financial Literacy

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Abstract

Introduction: With the growth of information and communication technology there have been emergence new avenues in the form of fintech that are providing innovative ways to digital financial inclusion. These avenues are gaining popularity among the vulnerable and financially exclusive section of the society. Financial inclusion is enabled by the financial literacy and the fintech usage. However, both financial literacy and fintech usage are not two separate dimensions, there exist an interrelationship between them. **Methodology:** for the purpose of the study primary data was collected from the urban areas of the **Bhopal region from 126 respondents** through scheduled interview method. To analyse the data various statistical tools like correlation analysis and regression analysis were used and finally the interrelationship between the financial literacy and financial usage was studied in the context of important parameters. **Results:** Among the various demographic and financial behaviour related parameters taken in the study those found significant were age, sex, education, nature of account, average monthly income and number of bank visits. **Conclusion:** There is a need to adopt demographic segmentation approach in studying the financial literacy and fintech usage relationship on different positions. The various policy recommendation moves in the short term includes organizing camps, customization and simplification of the mobile applications, leveraging peer group to promote the financial literacy. In the long-term policy must focus on bridging the digital gender gap and making financial literacy as an inclusive part of general literacy.

Keywords: 1. Bhopal, 2.Demographic Parameters, 3.Financial Inclusion, 4.Urban Poor, 5.Bank Visits, 6.Urban Poor, 7.Financial Inclusion, 8.Financial Exclusion, 9.digital gender gap, 10.nature of account

1. Introduction

Financial inclusion has become one of the important policy imperatives of the countries around the world particularly the developing countries. In the Indian political economic landscape financial inclusion particularly focuses on the vulnerable section of the society(Bhaskar, 2014). Among these sections there have been a neglected chunk of urban poor who have not been able to reap the benefits of the various schemes and initiatives of the financial inclusion(*K C Chakrabarty: Financial Inclusion of Urban Poor in India*, n.d.). However, with the growth of information communication technology there is a growing creed of fintech companies serving this section(Zhang et al., n.d.). Evidence from the recent literature has shown that fintech particularly mobile money has helped in promotion of the financial inclusion effectively especially in the developing economy(Demir et al., 2022; Thakor, 2020; Yoshino et al., n.d.). In some countries like Bangladesh there has been and jump from the traditional bank induced financial inclusion to the digital financial inclusion(Banna, 2020).

Fintech usage in the context of the urban poor involves the use of digital mode or mobile banking to cater to the daily needs and transactions of routine and simple nature(Raj & Upadhyay, 2020). Financial literacy plays an important role in the dissemination of fintech technology and its usage. On the other hand,fintech also promote the financial literacy through its innovative solutions and applications(Panos & Wilson, 2020).This relationship between the fintech usage and financial literacy particularly in the context of urban poor entails important policy dimensions which can go a long way in attaining universal financial inclusion.

2. Literature Review

(Morgan & Trinh, 2019)examines this relationship in a developing country, the Lao People's Democratic Republic (PDR). The study finds that a higher level of financial literacy has strong and positive effects on an individual's awareness of fintech products.

(Arner et al., 2018)highlights that the full potential of FinTech for financial inclusion may be realized with a strategic framework of underlying infrastructure and an enabling policy and regulatory environment to support digital financial transformation. The study identifies four main pillars,first pillar being building digital identification and e-KYC systems to simplify access to the financial system, second pillar is digital payment infrastructure and open electronic payments systems,third pillar combines the promotion of account opening and access with the electronic provision of government services and the fourth design of digital financial markets and systems.

(Yoshino et al., n.d.)investigates how financial literacy and other factors contributed to the adoption of fintech services in Japan, using data from a survey conducted by the Bank of Japan. The study finds that those with greater financial literacy tend to use fintech services, especially electronic money, more frequently. Additionally, the use of fintech services differs for people with different behavioural traits and that greater financial literacy could encourage risk-averse persons to adopt fintech.

(Gomber et al., 2018)presents a new fintech innovation mapping approach that enables the assessment of the extent to which there are changes and transformations in four key areas operations management, technological innovations, multiple fintech innovations and issues influenced by blockchain and fintech innovations of the financial services industry.

(Moenjak et al., n.d.)presents aconceptual framework of the connections between FinTech, financial behaviour, and financial knowledge and attitude, is then presented, to reflect the various feedback loops that policies could be used to address. The paper then reviews a three-pronged strategy aimed to promote FinTech, financial inclusion, and financial literacy in Thailand: (1) development of interoperable infrastructures that are key foundations of a digital economy; (2) introduction of supportive laws and regulations that help foster FinTech innovations and; (3) promotion of financial literacy at various fronts for people at various stage of life.

3. Problem or Research Gap

Surveying the above literature and various others it can be seen that there have been attempts to study the relationship of financial literacy and fintech usage across various geographies.Therefore, in study of this relationship *demographic segmentation approach* missing. Additionally, fintech usage and financial literacy are treated as almost one and the same thing which has led to the generalized and universal policy recommendations.

4. Approach or Research Methodology

For the purpose of this study the primary data was collected from the urban poor of the Bhopal region.The data was collected through scheduled interview method. A total of 126 respondents were surveyed in the areas around the urban Bhopal. Finally, the data is analysed with the help of various statistical and graphical tools.

5. Objectives

The study set out with the objectives of

- Understanding the interrelationship between financial literacy and fintech usage and deciphering the financial literacy and fintech usage relationship in the context of various demographic and financial behaviour related variables.
- Study the various positions of the financial literacy and fintech usage in a matrix view and analysing the patterns important parameters established on these positions.

### 5.1.1 Financial Inclusion and Financial Literacy

Financial inclusion in India particularly focuses on making available the financial products and services to the vulnerable section of the society ensuring easy access and universal usage with quality products and services(Barik & Sharma, 2019; Bhaskar, 2014). Financial inclusion occupies a dominant position in the socio-economic objectives of any democratic welfare state(Shetty, n.d.). However, with the growing technology, emerging new socio-economic realities and innovative financial landscape had made the financial inclusion a more dynamic and complex policy dimension for the developing countries particularly.

An effective financial inclusion is backed by the strong financial literacy of its citizens which not only ensures the knowledge of the financial transactions, goods and services but is also related to the good financial decision making. Further financial inclusion is also main important determining factor of ensuring strong financial literacy as the more integrated a person is with the financial and banking structure, the more financially literate he becomes.

5.1.2 Impact of Fintech Usage on Financial Literacy and Vice Versa

Evidences from various literature shows that fintech has helped in the increasing intake of mobile and internet based financial products and services. Rapid developments in the fintech industry (Financial Technology) are very much linked with the new dynamics of the financial literacy, highlighted by the peer group and mobile usage having more influence on the financial literacy of the person. The use of fintech has also have an effect on increasing the financial literacy through various innovative applications products and services.

Figure 1: Framework of the Study
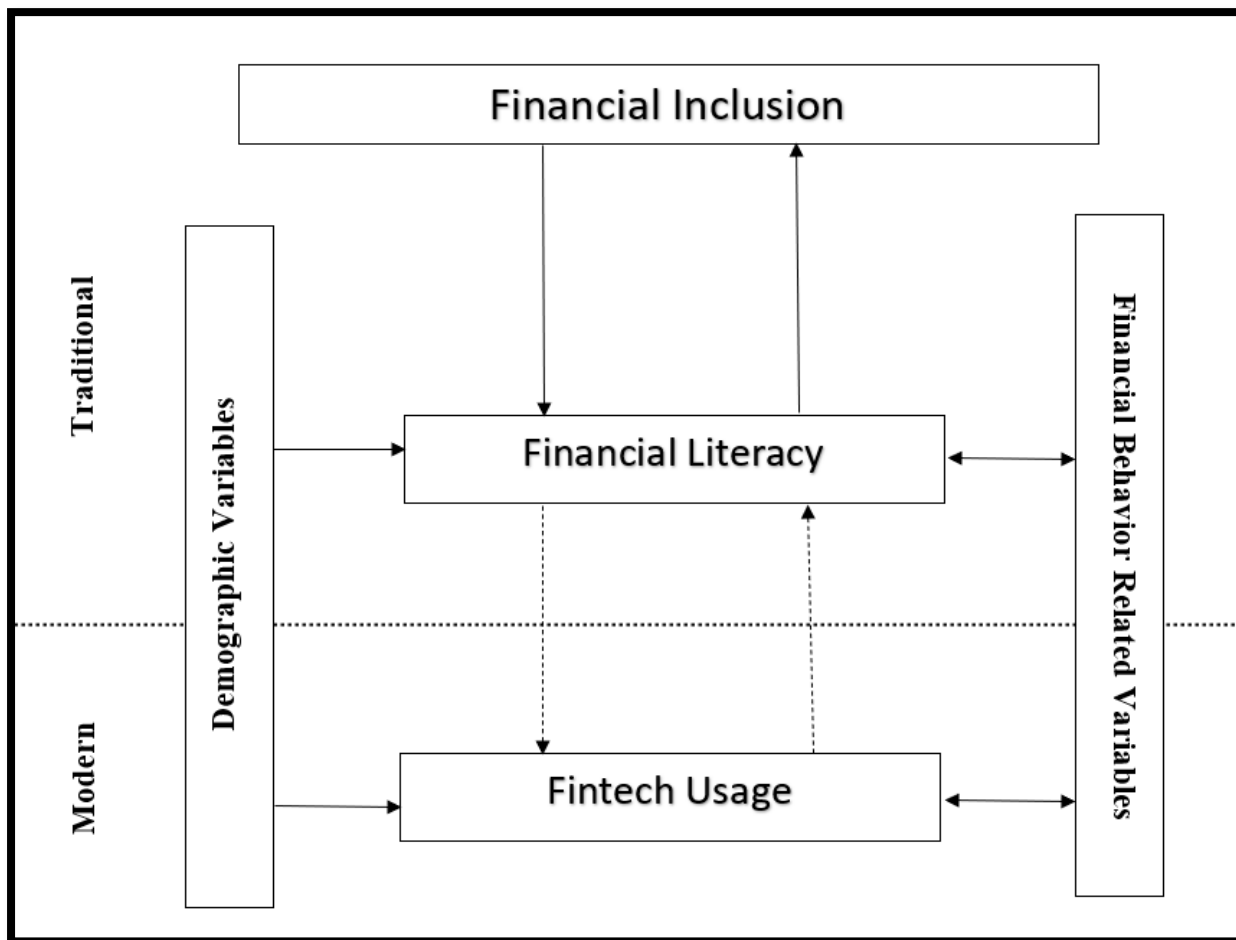
Source : Author's Own Creation

5.1.3 Financial Literacy

The variable financial literacy in the study is made up of survey items which are basically related to the financial transactions on the daily basis and basic financial services to be availed by the urban poor. These include how to open an account, knowledge of how to operate the account, self-filling of the documents. Each of the variable in the study what are equally weighed. Thus, the financial literacy score ranged from 0 to 5.

5.1.4 Fintech Usage

For the fintech usage the survey included three items which required the basic knowledge of the simple online transactions and awareness. These were ATM usage, Paytm usage and mobile usage(Li, n.d.; Putritama, 2019). Since all these items were weighed equally the fintech usage score ranged from 0 to 3.

5.1.5 Correlation Analysis

To understand the effective relationship of the financial literacy and fintech usage the study conducts the correlation analysis among the two variables and found strongly positive correlation of 0.719 significant with the p-value of 0.00. Thus, there is the highly significant correlation between the two variables which the study attempted to deciphered with the help of the regression analysis of both the variables on demographic parameters and financial behaviour related parameters.

*Table 1:Correlation Results of Financial Literacy and Fintech Usage*

		Financial Literacy	Fintech Usage
Financial Literacy	**Pearson Correlation**	1	.719[**]
	Sig. (2-tailed)		.000
	N	126	126
Fintech Usage	**Pearson Correlation**	.719[**]	1
	Sig. (2-tailed)	.000	
	N	126	126
**. Correlation is significant at the 0.01 level (2-tailed).			

5.1.6 Regression Analysis

Regression analysis of financial literacy and finance behaviour related parameters. The financial behaviour related parameters included numbers of members with bank accounts, bank visits, possession of ATM card, nature of bank account and link with Aadhar card. The r square of the model was 11.9% which was not good enough however, the effectiveness of the model ascertained with the help of ANOVA analysis was a found to be significant at 0.01 level if with F statistic equal to 3.157 the significant variables found were bank visits x1, possession of ATM x2 and link with Aadhar card x3.

$$\hat{y} = 0.2 + 0.037x1 + 0.718x2 + 0.97x3$$

Figure 2: Graphical Representation of Financial Literacy and Significant Financial Behaviour Related Parameters
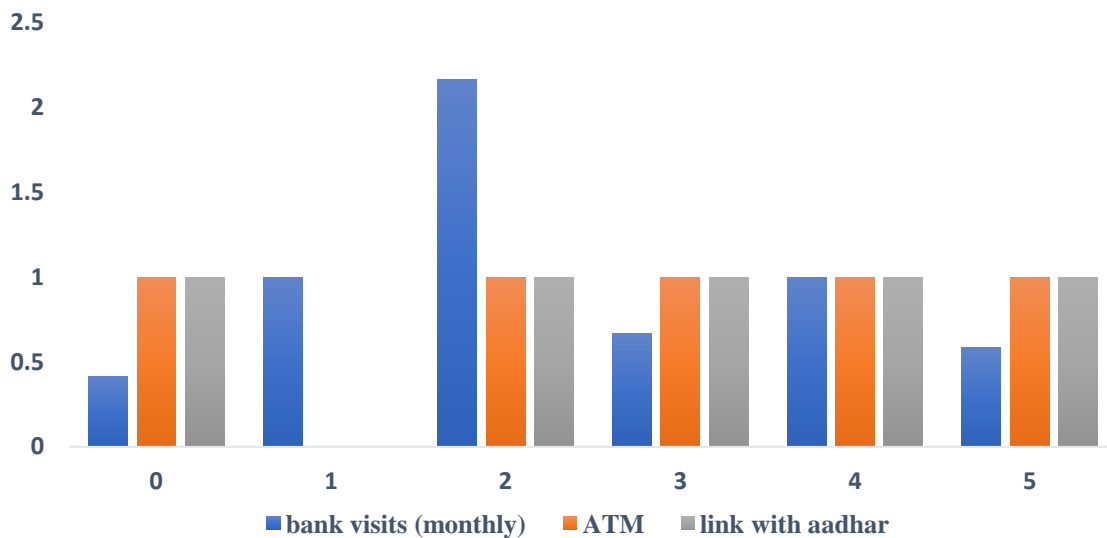
It can be interpreted from the data that no regular pattern is exhibited by the Possession of ATM card and Link with Aadhar card.

Regression analysis of fintech usage and financial behaviour related variable with the square of 31.9 person the predictability of the model was fine enough and the f statistic of 10.983 found to be significant at 0.01 level of significance. The significant variables in the model possession of ATM card x1 and link with Aadhar card x2, the regression equation obtained was

$$\hat{y} = -0.496 + 1.2x1 + 1.5x2$$

Regression of financial literacy on demographic variables. The demographic variables taken in the study were average monthly income, age, sex, education and migration. The r square of the model was 46.3 %, which was pretty good with the ANOVA analysis helping to ascertain the model effectiveness, the F statistic found was 20.715 with the significance level of 0.01 the only variable found significant was education x1.

$$\hat{y} = -00.431 + 0.21x1$$

Regression of fintech usage on demographic variables gave r square of 61.9 % which depicted the high predictability of the model, along with an F statistic of 38.932 significant at 0.05 level. One of the revealing findings of this regression analysis was that here all variables were found significant 0.01 level except average monthly income.

$$\hat{y} = 0.868 - 0.017x1 - 0.476x2 + 0.153x3 - 0.747x4$$

Where, x1 = age, x2 = sex, x3 = education, x4 = migration

Figure 3: Graphical Representation of Fintech Usage and Significant Financial Behaviour Related Parameters
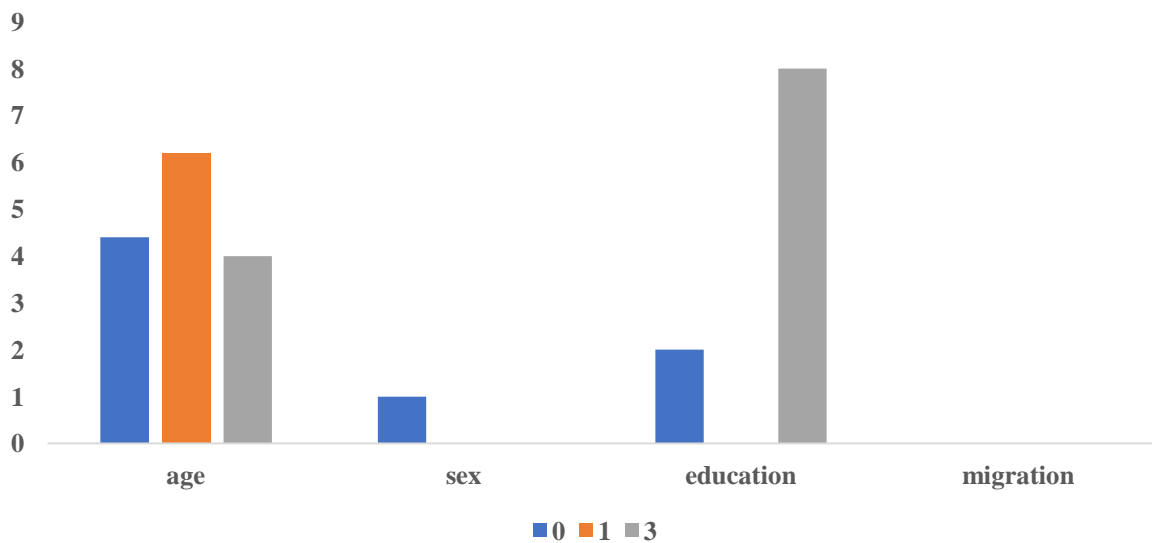
Fintech score of 2 had no data points, migration was found missing on all the three fintech scores, females (coded 1) were only on 0 score and the education level of those with score 1 was zero.

Based on the results of the above correlation and regression analysis the important parameters that can be used to study the financial literacy and fintech usage in a matrix pattern are number of bank visits, nature of account (though nature of account was not found to be a significant variable but since ATM card possession and link with Aadhar card were found to be highly significant the parameter with the policy action capability has been chosen to study the pattern on various positions), age sex education and average monthly income (migration has been left out because of the various dimensions it entails)

5.2. Deciphering Financial Literacy Fintech Usage Relationship – A Matrix Study

Financial literacy has been the enabler of both financial inclusion and the fintech usage whereas fintech usage contributes to the promotion of neo financial literacy and digital financial inclusion. Therefore, there is a need to ensure both strong financial literacy and high fintech usage. The study therefore attempts to analyse the financial literacy fintech usage in a matrix pattern by dividing it into four positions as a specified in the table. Deciphering the financial literacy and financial usage interrelationship the study attempts to decode the patterns on various parametersidentified as important from the above correlation and regression analysison the various positions.

Table 2: Distribution of Various Variables on the Financial Literacy – Fintech Usage Matrix

Financial Literacy – Fintech Usage	Age	Sex	Education	Nature of Account	Average Monthly Income	Bank Visits (yearly)
High – High	39	0	8	1	10333	8
High - Low	60	0	8	1	12000	4
Low – High	42	0	8	0	11333	12
Low - Low	45	1	2	1	6586	7

*Sex 0 = Male; 1 = Female
**Nature of Account 0 = Non-Zero Account; 1 = Zero Account

Figure2: Graphical Representation of Variables as per Financial Literacy – Fintech Usage Matrix and their Regression Analysis

Figure 4: Financial Literacy – Fintech Usage Matrix Along Recommended Policy Actions
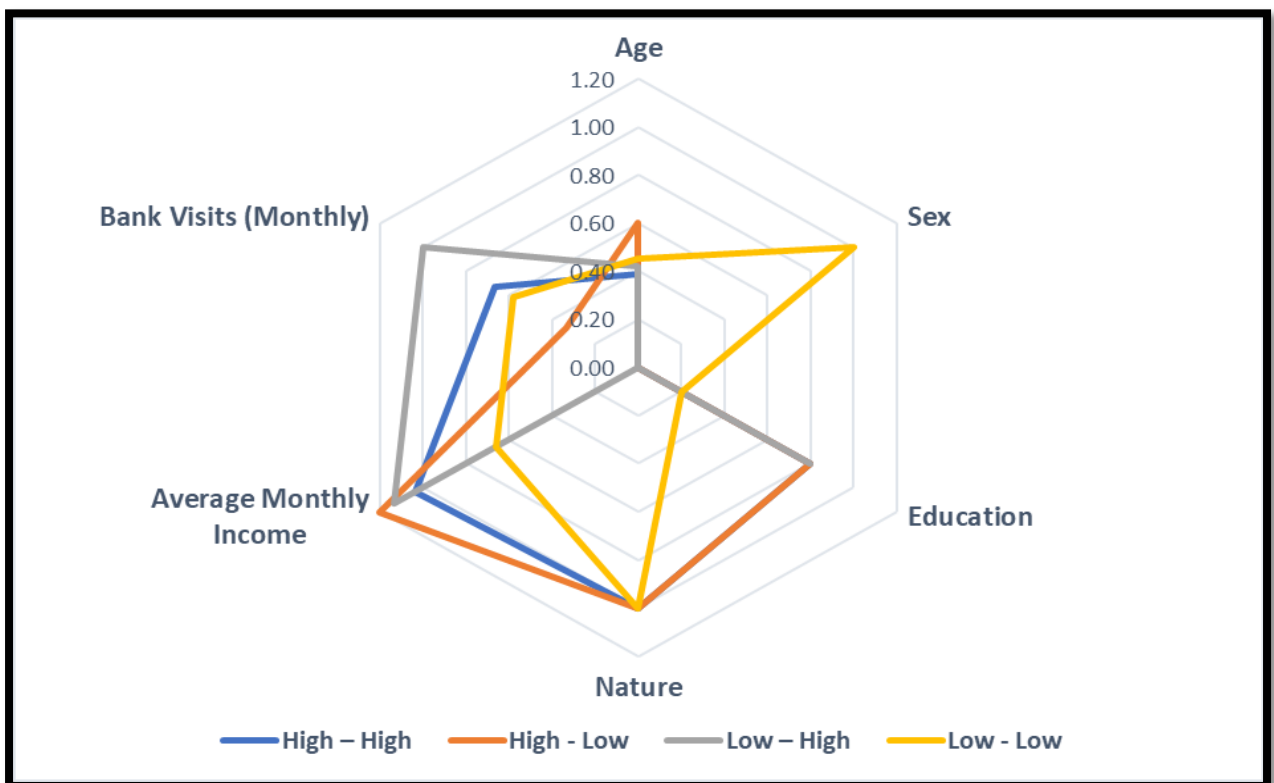
High-High: This is the most aspiring position which can prove to be an enabler for the promotion of digital financial inclusion and increasing urban poor integration with the bank. This position was mostly found among the young males with an average education level of 8 and average monthly income of around 10000. This position was mostly prevalent among the zero account holders. The recommended move is to swim to the desired position.

High-Low: Even though this position is good enough to promote the financial inclusion but the future adaptability towards the digital financial inclusion is not promising. This position is prevalent among the elderly male population with average education level of 8 and a good monthly income backed by the zero account, this position depicts the low urban poor-bank interaction highlighted by the smaller number of bank visits. The recommended move is to jump to the fintech usage.

Low-High: Prevalent among the young male population with an average education level of 8 again. This position highlights revealing findings, one being a greater number of bank visits and other being the non-zero nature of account. The position of the non-zero nature of account depicts relatively less bank customer integration therefore, the explanation for the greater number of bank visits could be for the purpose of deposits and withdrawals. The recommended move is to milk this cow and further promote digital financial inclusion.

Low-Low: This depicts the very dismal state of affairs which it was found to be prevalent among the middle-aged females most prominently, those having a low level of education and a very less average monthly income. One of the promising features in this position was the good number of bank visits. The recommended move is to slowly and steady work on the socio-economic fundamentals.
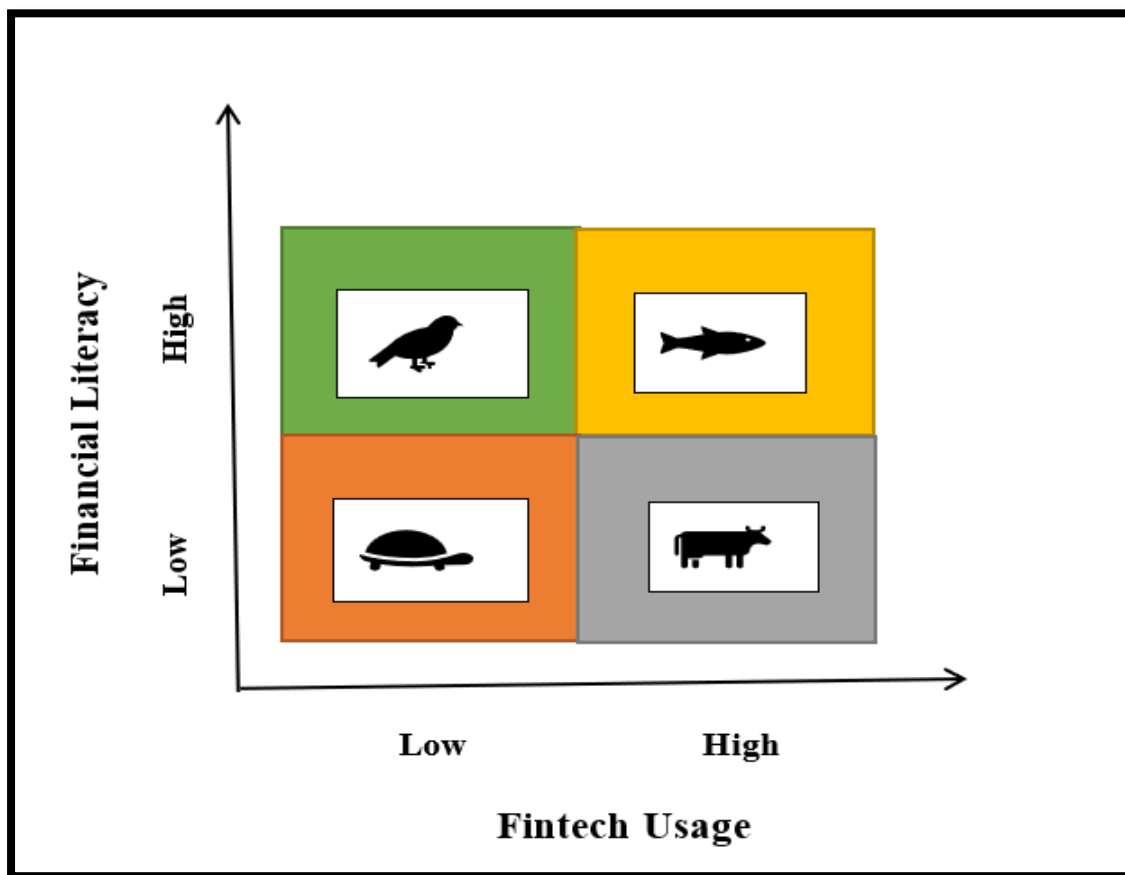
Source: Author's own creation

On conducting the regression and correlation multichart analysis of the various important parameters on the 4 positions it was found that there was perfect negative correlation between the sex and education and strong negative correlation in age and bank visits. Nature of account and yearly bank visits also depicted strong negative linear correlation which can actually explain the dormant nature of the zero accounts. There was a strong negative correlation between the sex and average monthly income and strong positive correlation of same strength between the education and average monthly income which has already been explained by various literatures.

Figure5: Correlation and Regression Analysis Among Different Variables
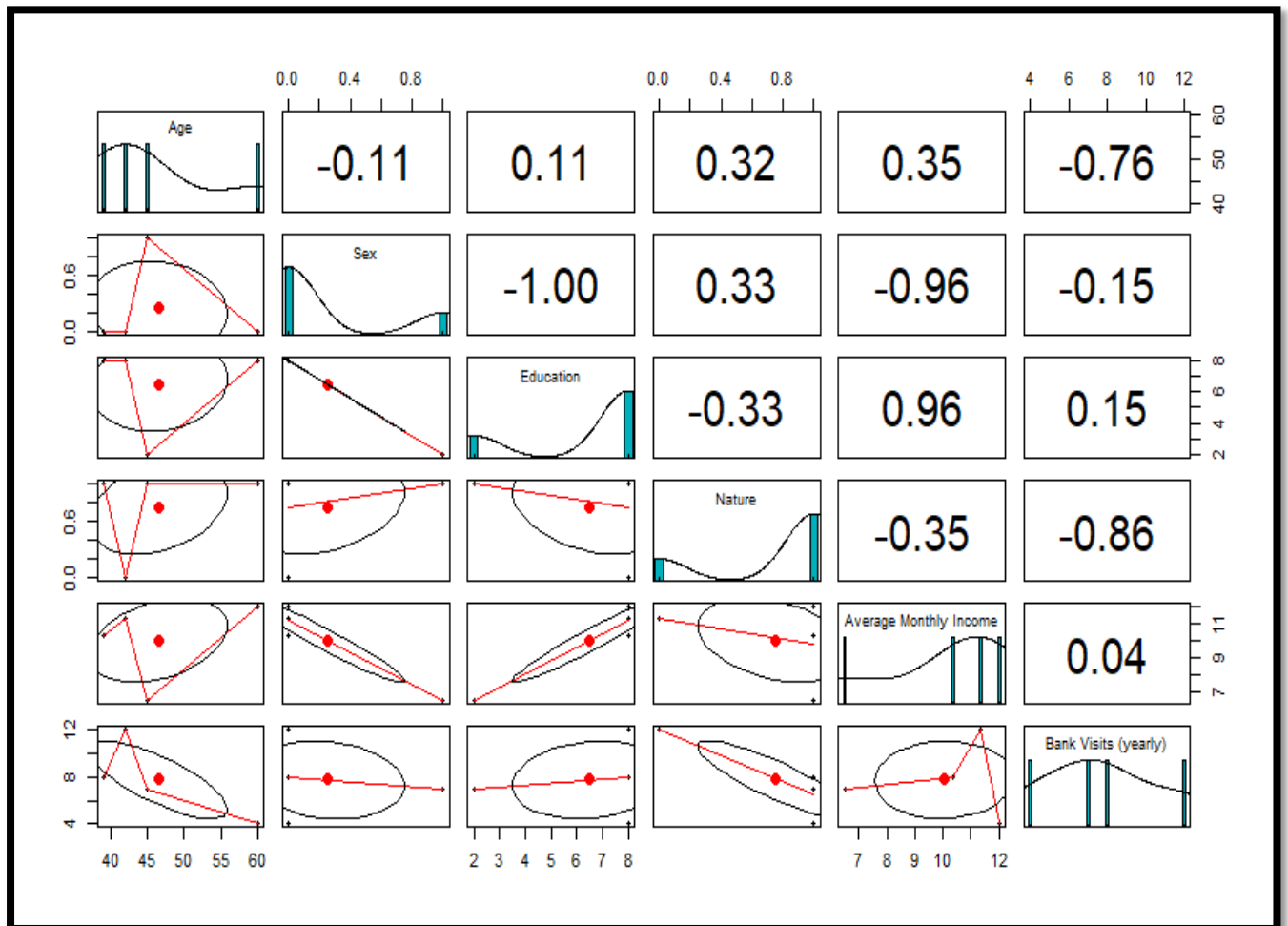
6. Findings

Based on the above analysis of the interrelationship between fintech usage and financial literacy the important findings of this study are

- In spite of a strong positive correlation between financial literacy and fintech usage both have different determining significant factors in terms of demographic and financial behaviour related parameters.

- Education as a determining factor of the financial literacy and fintech usage has the coefficient of 0.21 and 0.15 respectively depicting its direct contribution of low magnitude to these scores. However, it has high correlation with the sex and average monthly income on the various positions in the matrix, which highlights its significance as one of the important long-term policy dimensions.

- Financial literacy is least affected by bank visits as explained by the first two positions in the matrix and its coefficient of 0.037 in the regression equation.

- High negative correlation in the number of bank visits and the nature of account and age of - 0.86 and - 0.76 respectively depict the dormancy of the zero accounts and the lesser number of visits made by the old aged people.

- Financial literacy and fintech usage require segmentation of the demography as per the position on which they stand in the matrix pattern and a recommended strategic move to reach the desirable position.

7. Suggestions

Based on the above analysis and the findings of this study the suggested strategic moves and important policy recommendations are

1. With the long-term policy focus on education women empowerment and inclusive development the short-term strategy for increasing financial literacy needs of organising of camps strong and effective grievance redressal mechanism and infrastructure and simplification of procedure.
2. Increasing fintech usage required in the long-term participation of more number players and encouraging digital literacy. However, in the short term it requires technological innovations that simplify the use of application and leveraging of the peer group to promote its usage.
3. Various policy recommendations on the various position of the financial literacy fintech usage matrix are

Financial Literacy – Fintech Usage	Recommended Move	Policy Recommendations
High – High	**Swim**	There is a need to address the grievances of the people and for the promote the financially literacy and fintech usage. Organising camps, grievance redressal in the premises of the banks and having application in the mobile to register complaints.
High – Low	**Fly**	In this position short-term measures and tactical moves can push the position up an acquaint them with the digital modes and online transactions. Customising the mobile applications as per the needs of the old age people and females.
Low – High	**Milk the Cow**	In spite of low financial literacy this is an aspiring position which can be used as a cash cow and it paves the way for future digitalization.
Low – Low	**Slow and Steady**	This position shows the dismal state of affairs which requires long term strategy to tackle with the problem of low education and gender disparity.

8. Conclusion

The study examined the interrelationship of financial literacy and fintech and the impact of various demographic and financial behavior related parameters on them.The parameters that came out to be significant were age, sex, education, average monthly income, nature of account and number of bank visits. Further the study attempts to decipher the relationship between the financial literacy and fintech usage in a matrix view establishing four different positions. The study analyses the pattern exhibited by the various significant parameters identified on these different positions. The policy recommendations moves suggested are swim, fly, milk the cow and slow and steady on the High - High, High - Low, Low - High and Low - Low positions respectively. Thus, the various policy initiatives required in the short term are organizing camps, customization and simplification of mobile application, leveraging peer group to promote fintech usage and in the long term there is a need to bridge thedigital literacy gap, general literacy gap and achieve inclusive economic development.

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