Economics Bulletin

Volume 39, Issue 4

# Gender Gap in case of Financial Inclusion: An Empirical Analysis in Indian Context

Chandralekha Ghosh
*West Bengal State University*

Rimita Hom Chaudhury
*West Bengal State University*

## Abstract

The existence of gender gap in financial inclusion has come into prominence in recent times. In this context, using global Findex household-level database for the year 2017 our study aims to evaluate the presence of gender gap in financial inclusion for India. The empirical findings suggest that women are significantly less likely to be financially included as compared to their male counterparts. Using Fairlie Decomposition technique, this paper also finds the statistical evidence which reveals that gender differences in socio economic variables largely explain the gender gap in financial inclusion. More precisely, it is observed that lower employment status within females is a crucial reason of not having formal account, formal saving and formal credit requirement. However, lower education among females predominantly prohibits them from using digital financial services.

**Citation:** Chandralekha Ghosh and Rimita Hom Chaudhury, (2019) "Gender Gap in case of Financial Inclusion: An Empirical Analysis in Indian Context", *Economics Bulletin*, Volume 39, Issue 4, pages 2615-2630
**Contact:** Chandralekha Ghosh - ghoshchandralekha@yahoo.com, Rimita Hom Chaudhury - rimitahomchaudhury@gmail.com.
**Submitted:** March 05, 2019. **Published:** November 16, 2019.

# 1. Introduction

"Financial inclusion is defined as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups, such as weaker sections, and low-income groups at an affordable cost" (Rangarajan Committee, Jan 2008).The financial inclusion carries several benefits for poor households. It provides them with opportunities to build savings, make investments and access credit (Ellis et al. 2010). In addition, it enables them to handle income shocks efficiently, and also helps to overcome unforeseen emergencies, such as illness or loss of employment. The study by Aterido et al. (2013) on Sub-Saharan Africa has observed the possibility of not having a significant gender gap when key observable characteristics are taken into account. In contrast, Demirgüc¸-Kunt et al. (2013), documented a gender gap in ownership of accounts and usage of savings and credit products, even after controlling for a host of individual characteristics including income, education, employment status, rural residency, and age. This argument is put forwarded by Fanta, B. A., and Mutsonziwa, K. (2016), who have examined the significance of gender discrimination in financial inclusion in the SADC region with a view to providing policy prescriptions. This paper has also discussed the barriers against women in financial inclusion, such as low financial literacy, lack of money, preferences on informal provider over banks, bank's location, etc. According to the recently released FINDEX database 2017, out of the 1.7 billion adults globally who do not have bank accounts, about 56 percent are women.27 percent of adults reported of saving money at a financial institution,whereas, men are five percentages more likely to save than women.Similar evidence is manifested in terms of the credit card. It has been specified that men are three percent more likely to borrow from a financial institution than their female counterparts. Thus, World Bank highlighted in their reports that financial inclusion is not gender-neutral and women are under-represented in access and usage to financial services.

Gender inequality is a global phenomenon because the exclusion of women from any social and economic activity impacts directly on a nation's development.Many studies already have given evidence in this regard and more recently an elimination of gender inequality became the central part of sustainable development goal 2030. The achievement of Sustainable Development Goals (SDGs) could be difficult without gender equality and women empowerment. It has been largely accepted in recent eras that access to financial services can improve the situation of women together with other vulnerable sections of society. Because when women take part in the financial system, they are better able to manage risk, start or invest in a business,improve their bargaining position in the household and also fund large expenditures like an education or a home improvement (Dupas and Robinson, 2013, Ashraf et al., 2010).To end with, effective access to a range of financial products and services that cater to the multiple needs of women can uplift their status socially and even economically.

A recent study in India by Swamy (2014) reported that women with access to micro-credit experience higher income growth than men (8.40 percent for women against 3.97 percent for men). Besides, one noticeable ending of this analysis is that women are largely impacted by the financial inclusion programs, mostly because of their awareness levels and access to the instruments of economic progress. They also report that women use the resources in such a way that improves the family well-being and contributes to a

significant increase in savings levels of the households.Abdu et al. (2015), show the existence of a gender gap in financial inclusion in Nigeria. World Bank reports a significant gender gap even in mobile account ownership.
Certain evidence appears to suggest a significant gender gap in access to finance in India. A study by Ghosh, A. & Vinod, D. (2016), has found an evidence of significant gender disparities in both the access and the use of finance in India. More specifically, female-headed households are 10% less likely to access formal finance as compared to households that are headed by males. Similar evidence carries over to the use of finance as well.Ghosh, A. & Vinod, D. (2017), also have investigated the possible channels which impede financial inclusion for female-headed households in India and findings suggest that the discrimination in socioeconomic channels worsen access to finance for female-headed households. Studies by Deléchat et al. (2018) and Demirguc-Kunt et al. (2013) have found that the legal discrimination, lack of protection from harassment, including at the workplace, and more diffuse gender norms are the possible explanatory factors for gender discrimination in financial inclusion.

Given this background, it is hard to identify to what extent gender differences in socioeconomic variables explain the gender gap in financial inclusion. Which socioeconomic characteristic has the highest contribution to the gender gap and how the result differs with different indicators of financial inclusion? The present study tries to answer many questions regarding the gender gap and also aims to examine whether the gender difference in the socioeconomic variables predominantly contribute to the gender gap or there exists some unexplained reasons behind this gender gap in financial inclusion. The rest of the paper is organized as follows. Section2 presents data and empirical model to analyze the gender gap in different indicators of financial inclusion. Section 3 discusses and interprets the results. Finally, Section 4 concludes.

## 2. Data and Methodology

Data for the study were obtained from the 2017 Global Findex database. The Global Findex data were collected in conjunction with the annual Gallup World Poll Survey and cover more than 140 economies around the world. In our analysis, we have focused mainly on India.
The study adopted the Fairlie nonlinear decomposition technique (Fairlie, 2006) to analyze gender gap in financial inclusion in India. Fairlie decomposition technique, is an extension of Blinder-Oaxaca decomposition, which is mainly used if the outcome is binary and the coefficients are from a Logit or Probit model.

Fairlie decomposition model can be specified as:

$$\bar{Y}^M - \bar{Y}^F = \left[\sum_{i=1}^{N^M} \frac{F\left(X_i^M \hat{\beta}^M\right)}{N^M} - \sum_{i=1}^{N^F} \frac{F\left(X_i^F \hat{\beta}^M\right)}{N^F}\right] + \left[\sum_{i=1}^{N^F} \frac{F\left(X_i^F \hat{\beta}^M\right)}{N^F} - \sum_{i=1}^{N^F} \frac{F\left(X_i^F \hat{\beta}^F\right)}{N^F}\right] \ldots\ldots\ldots (1)$$

Where, $N^j$ is the sample size for gender j (M=male, F=Female). $\bar{Y}^j$ is the mean probability of outcome variable for sex j, $X_i^j$ is the vector of independent variables for case i in sex j,

$\hat{\beta}^j$ is the vector of coefficient estimates including a constant term, and F is the cumulative distribution function from the logistic distribution. The first term in brackets represents the part of the gender gap that is due to group differences in distributions of X (i.e., differences in the distributions of the independent variables), and the second term represents the part due to differences in the group processes determining (i.e., differences in the coefficients) levels of Y. The second term also captures the portion of the gender gap due to group differences in unmeasurable, or unobserved endowments. Notably, we use the male coefficient estimates ($\hat{\beta}^M$) as weights in the first term of the equation and the female distribution of independent variables ($X^F$) as weights in the second term.

An equally valid expression for the decomposition is:

$$\bar{Y}^M - \bar{Y}^F = \left[\sum_{i=1}^{N^M} \frac{F(X_i^M \hat{\beta}^F)}{N^M} - \sum_{i=1}^{N^F} \frac{F(X_i^F \hat{\beta}^F)}{N^F}\right] + \left[\sum_{i=1}^{N^M} \frac{F(X_i^M \hat{\beta}^M)}{N^M} - \sum_{i=1}^{N^M} \frac{F(X_i^M \hat{\beta}^F)}{N^M}\right] \ldots\ldots(2)$$

Here, the female coefficient estimates, ($\hat{\beta}^F$) are used as weights for the first term in the decomposition, and the male distributions of the independent variables, ($X^M$) are used as weights for the second term. This alternative method of calculating the decomposition often provides different estimates, which is the familiar index problem with the Blinder-Oaxaca decomposition technique. A third alternative is to weight the first term of the decomposition expression using coefficient estimates from a pooled sample of the two groups. We follow this approach in our study to calculate the decompositions. In particular, we have used coefficient estimates from a logit regression that includes a sample of all gender groups.

An additional calculation, however, is needed to identify the contribution of gender differences in specific variables to the gap. For example, assume that X includes two variables, $X_1$ and $X_2$. The independent contribution of $X_1$ to the gender gap can then be expressed as:

$$\frac{1}{N^F}\sum_{i=1}^{N^F} F(\hat{\alpha}^* + {X_{1i}}^M \widehat{\beta_1}^* + {X_{2i}}^M \widehat{\beta_2}^*) - F\left(\hat{\alpha}^* + {X_{1i}}^F \widehat{\beta_1}^* + {X_{2i}}^M \widehat{\beta_2}^*\right) \ldots\ldots(3)$$

Similarly, the contribution of $X_2$ can be expressed as:

$$\frac{1}{N^F}\sum_{i=1}^{N^F} F(\hat{\alpha}^* + {X_{1i}}^F \widehat{\beta_1}^* + {X_{2i}}^M \widehat{\beta_2}^*) - F\left(\hat{\alpha}^* + {X_{1i}}^F \widehat{\beta_1}^* + {X_{2i}}^F \widehat{\beta_2}^*\right) \ldots\ldots(4)$$

A useful property of this technique is that the sum of the contributions from individual variables will be equal to the total contribution from all of the variables evaluated with the full sample. This technique estimates the total contribution of sex differences in the independent variables to the gender gap in the dependent variable. It also allows us to estimate the separate contribution of each independent (explanatory) variable to the

overall gap. The contribution of each explanatory variable to the gap is thus equal to the change in the average predicted probability from replacing the female distribution with the male distribution of a specific variable, holding the distributions of the other variables constant.
The decomposition technique involves a one-to-one matching of cases between the two groups. Since the number of female and male is not identical, we draw a random sub-sample of females with or without replacement equal to the size of the full male sample, and matching the sample by their respective rankings in predicted probabilities. As the decomposition estimates are sensitive to the sub-sample chosen, we thus draw 1,000 different sub-samples and our results based on average values obtained from decompositions carried out over these sub-samples. The separate contributions of independent variables or groups of independent variables may be sensitive to the ordering of variables. We therefore randomize the order of the variables across the simulations and perform the 'Fairlie decomposition' using the 'fairlie' command in 'STATA' to compute both the estimates as well as standard errors. We have obtained the amount of gender gap explained by the socioeconomic variables, and also the unexplained gender gap.

Here, we have used "Blinder-Oaxacadecomposition to nonlinearmodels (nldecompose)" (Bauer and Sinning (2008))with pooled variable incorporating bootstrap option to find out the significance levels of overall gaps. And after performing the 'Fairlie decomposition (2006)' technique, we have used "Nonlinear combinations of estimators (nlcom)"[1]to obtain the significance levels of explained and unexplained gaps.Nonlinear combinations of estimators (nlcom) use the delta method, and it is a useful technique for the simultaneous estimation of multiple linear combinations.The significance level of the difference in gap as well as the significance level of the explained gap have been reported.

# 3. Results and Analysis

Preliminary analysis is conducted using descriptive statistics for some indicators of financial inclusion to compare across gender groups. A more robust analysis has been conducted through Fairlie nonlinear decomposition technique, to capture the effect of gender differences in socioeconomic variables on the gender gap in financial inclusion.

## 3.1.Preliminary analysis

We begin the analysis by documenting information on the basic dimensions of financial inclusion. To be more specific, we provide information mainly on account ownership, formal saving, formal borrowing, availability of modern technology, access to the account, and mode of access by gender. The descriptive statistics reported in Table I show 79.33 percent of Indians informed of having a formal account, 19 percent saved formally and only 6.6 percent reported of borrowing formally. These are the three main measures of financial inclusion and each of them is lower for females compared to males.82.5 percent of males have a formal account, while the percentage of females having an account is 76.4. 21.5 percent of males saved money at a formal financial institution in the

[1]Nonlinear combinations of estimators, a post estimation technique, computes point estimates, standard errors, test statistics, significance levels, and confidence intervals. Using "nlcom" command in 'STATA' we have obtained our required significance levels.

past 12 months compared to only 16.6 percent of females. Likewise, gender bias has also been observed for formal credit too.

Gender differences are also observed for account usage in the past 12 months. About 42 percent of adults reported of using an account either for depositing money or for withdrawing money or for both. Females are 9.2 percent less likely to deposit and 11.8 percent less likely to withdraw than their male counterparts. This infers that males have used the account more actively compared to females.

**Table I: Descriptive Statistics of Different Indicators of Financial Inclusion by Gender**

| Variables | Obs. | Mean (total) | Mean (male) | Mean (female) |
|---|---|---|---|---|
| ***Main indicators of financial inclusion*** | | | | |
| Formal account | 3000 | 0.793 (0.40) | 0.825 (0.38) | 0.764 (0.42) |
| Formal saving | 3000 | 0.190 (0.39) | 0.215 (0.41) | 0.166 (0.37) |
| Formal borrowing | 3000 | 0.066 (0.25) | 0.083 (0.28) | 0.049 (0.22) |
| ***Usage of account in past 12 months*** | | | | |
| Deposit | 2380 | 0.418 (0.49) | 0.463 (0.50) | 0.371 (0.48) |
| Withdrawal | 2380 | 0.421 (0.49) | 0.480 (0.50) | 0.362 (0.48) |
| ***Availability of modern technology*** | | | | |
| Debit card | 3000 | 0.314 (0.46) | 0.396 (0.49) | 0.237 (0.43) |
| Credit card | 3000 | 0.029 (0.17) | 0.039 (0.19) | 0.021 (0.14) |
| Mobile phone | 3000 | 0.688 (0.46) | 0.776 (0.42) | 0.605 (0.49) |
| ***Mode of usage*** | | | | |
| Debit card usage in past 12 month | 943 | 0.350 (0.48) | 0.375 (0.49) | 0.311 (0.46) |
| Credit card usage in past 12 month | 88 | 0.739 (0.44) | 0.732 (0.45) | 0.750 (0.44) |
| Used mobile phone or internet to access FI account | 2380 | 0.061 (0.24) | 0.073 (0.26) | 0.048 (0.21) |
| ***Mobile money banking*** | | | | |
| Mobile account | 3000 | 0.022 (0.15) | 0.031 (0.17) | 0.013 (0.11) |

Source: Global Findex Database, 2017
Note:Standard deviations are denoted in parentheses

The goal of financial inclusion is expected to be achieved if digital finance comes into force. Digital finance is financial services delivered through mobile phones, the internet or cards linked to a reliable digital payment system. Gender disparity also exists in the use and availability of digital financial services in India. 68.8 percent of Indians reported of having mobile phones, but only 2.2 percent reported of using the mobile account. The results tabulated above indicate that males have 17.1 percent more possibility to have a

mobile phone as compared to females. Only 1.3 percent of females have a mobile account, while the percentage for males is 3.1. Similarly, the likelihood of accessing the formal account using a mobile phone or internet is also higher for males (7.3 percent for males versus 1.3 percent for females) as compared to females.

Debit card, another mode of transaction, is well accepted among the Indian adults. It not only allows cash withdrawal from ATMs but also in many cases, this card can be used for payment in place of cash.Table I reports that the availability and accessibility both are higher for a male in terms of debit cards. 39.3 percent of males reported of holding a debit card while the percentage is only 23.7 for females. Furthermore, females have 31.1 percent possibility of using a debit card in comparison to 37.5 percent for males. Unlike debit cards, credit cards are not that popular among Indian adults. We observe an interesting difference between credit card availability and accessibility across gender. Males resort more to credit card holding but females resort more to credit card using. Though females have 1.8 percent less probability of holding the credit card but have 1.8 percent more probability of using such cards.

## 3.2. Gender differences in financial inclusion

This section represents the relation between gender and financial inclusion and also explores the contribution of gender differences in different socioeconomic variables to the gender gap in financial inclusion. The detailed decomposition has been done using the "Fairlie non-linear decomposition"technique. But before conducting the decomposition we have carried out chi-square test for categorical variables and t-test for continuous variables to examine differences between the male and female in terms of age, education, employment status, income level and find out whether the difference is statistically significant or not(See, Appendix, Table no A.I, A.II and A.III). There are significant differences between male and female in terms of education level, occupation level, income level 1 and income level 2. Again, using the chi-square test we also have examined that all the dependent variables significantly differ with gender (see, Appendix, Table no A.IV). The results of Fairlie non-linear decomposition technique using pooled coefficients are presented in Table II and Table III below.

### 3.2.1. Gender gap and Three main indicators of financial inclusion

The descriptive statistics confirmed differences between males and females in terms of account ownership, formal saving and formal borrowing. As reported in Table II the gender gap in an account's ownership is significant and the rate is 0.06044. This positive gap implies that males are 6.04 percent more likely to have formal accounts than their female counterparts. Having found evidence of a gender gap we analyze the extent to which observable characteristics do explain these results. The outcome shows that the gender differences in all the socioeconomic variables (such as, age, income, education and employment status) account 61.93 percent of the total gap. Employment status explains 34.21 percent of the gender gap in financial inclusion in terms of account

ownership. Therefore, employed women are more likely to have a bank account in their name. Gender differences in secondary education account 23.56 percent to the total gap whereas differences in tertiary education explain only 12.27 percent of the total gender gap. Therefore, improvement of educational status within females can reduce the gender gap in case of account ownership to a certain extent.

The decomposition estimates intended for formal saving are consistent with the fact that there exists a significant gender gap in case of savings at a financial institution. The overall difference between male and female in formal saving is 4.9 percent. All included observable characteristics explain roughly 100 percent of the total gap, this result infers that gender diversity in formal savings is entirely due to the differences in socioeconomic characteristics across gender.

**Table II: Fairlie Non-Linear Decomposition of Gender Gap in Formal Accounts, Formal Savings and Formal Borrowings**

| | **Formal Account** | | **Formal Saving** | | **Formal Borrowing** | |
|---|---|---|---|---|---|---|
| **Variables** | Logistic Results | Decomposition | Logistic Results | Decomposition | Logistic Results | Decomposition |
| Gender | -0.1392 | NA | 0.0128 | NA | -0.3804** | NA |
| Age | 0.1034* | -0.00694 | 0.0435* | -0.00063 | 0.0313 | 0.00037 |
| Age square | -0.0010* | 0.00177 | -0.0003 | -0.00007 | -0.0002 | -0.00054 |
| Income level 1 (Poorest 20%) | -0.1892 | 0.00082 | -1.2182* | 0.00353*** (7.15%) | -0.0177 | 0.00004 |
| Income level 2 (Second 20%) | -0.0836 | 0.00040 | -0.6964* | 0.00237*** (4.82%) | -0.1037 | 0.00018 |
| Income level 3 (Third 20%) | -0.0427 | -0.00012 | -0.4595* | -0.00001 | -0.2566 | -0.00010 |
| Income level 4 (Fourth 20%) | -0.2843*** | -0.00085 | -0.3185** | -0.00077 | 0.0758 | 0.00013 |
| Secondary education | 0.7795* | 0.01424* (23.56%) | 0.5122* | 0.00998* (20.25%) | 0.2616 | 0.00265 |
| Tertiary education | 2.3093* | 0.00742* (12.27%) | 1.2429* | 0.01058* (21.46%) | 0.1561 | 0.00046 |
| Employment | 0.3937* | 0.02068* (34.21%) | 0.5376* | 0.02597* (52.68%) | 0.4233** | 0.00998** (29.22%) |
| Group(male) | | 0.82450 | | 0.21542 | | 0.08328 |
| Group(female) | | 0.76406 | | 0.16613 | | 0.04913 |
| Difference/gap | | 0.06044* | | 0.04929* | | 0.03415* |
| Unexplained gap | | 0.02301 (38.07%) | | -0.00166 (-3.37%) | | 0.02098 (61.45%) |
| Explained gap | | 0.03743** (61.93%) | | 0.05095** (103.37%) | | 0.01317 (38.55%) |
| Constant | -1.206* | | -2.789* | | -3.706* | |
| Observations | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 |
| LR chi2(10) | 187.98 | | 203.6 | | 35.17 | |
| Prob> chi2 | 0.0000 | | 0.0000 | | 0.0001 | |

Data Source: Global Findex database, 2017.
Note: Parentheses denote the percentage in respect to total gap
* Significance at the 1% level ** Significance at the 5% level *** Significance at the 10% level

As expected,the largest factor explaining the gender disparity in formal savings is employment status. This variable accounts about 53% of the gap in the savings.Gender differences in secondary and tertiary levels of education, separately explains almost 21 percent of the total gap. Poor women are less likely to save at a financial institution. A sufficient improvement of income among females in category income level 1 and in category income level 2 can reduce the gender gapup to7.15 percent and 4.82 percent respectively of the total gap.

Table II also reports that the male-female gap in formal borrowing is 3.4 percent. Positive gap implies women lag behind their male counterparts in terms of use of formal credit.Unlike the above, differences in all included socioeconomic characteristics across gender representabout 38.55 percent of the gap. The contribution of employment status in having the gender gap is only29.22 percent in case of formal borrowing. The unexplained gap in the case of formal borrowing is high. This indicates, apart from socioeconomic factors, there are other factors which contribute to the disparity in formal credit usage across gender. The research also highlights that although the overall gender gap is significant for all the three dependent variables, the explained gap is statistically significant only for formal account ownership and formal savings. Socioeconomic variables explain the financial inclusion gap in case of account ownership and savings.

### 3.2.2. Gender gap and Digital financial Services

Digital financial inclusion can be defined as digital access to and use of formal financial services by excluded and underserved populations. Such services are provided at a cost that is affordable to customers and sustainable for providers. It is widely accepted in the number of studies that transactions costs act as a barrier to financial inclusion and digital financial services are found to significantly reduce these transaction costs, both in monetary terms (Allen et al., 2012) as well as in terms of time (World Bank, 2014). It is already mentioned in our summary statistics that digital financial services are also not free from gender bias and the results reported inTable III provide evidence in this regard.

The overall gap between male and female in terms of debit card holding is 15.92 percent, this indicates that males are 15.92 percent more likely to have a debit card than the females. Gender differences in all included socioeconomic variables explain 53.46 percent of the gap. An adequate increase in education, within women, up to secondary level can reduce the gap by 21.08 percent and again more growth in education level can reduce the gap by 10.15 percent. Discrimination across gender in some other socioeconomic variables, such as employment status and income level, also ensures a significant share to the total gap in case of debit card holding. Gender disparity in income level 1 contributes 4.25 percent to the total gap while this disparity in income level 2 contributes only 2.59 percent to the gap.

**Table III: Fairlie Non-Linear Decomposition of Gender Gap in Digital Financial Services**

| | Debit Card Holding | | Debit Card Using | | FI Account Access Using Mobile Phone or Internet | |
|---|---|---|---|---|---|---|
| **Variables** | Logistic Results | Decomposition | Logistic Results | Decomposition | Logistic Results | Decomposition |
| Gender | -0.4588* | NA | -0.1681 | NA | -0.1240 | NA |
| Age | 0.1182* | -0.0029 | -0.0112 | -0.00006 | 0.0721*** | 0.0030 |
| Age square | -0.0014* | 0.0080 | 0.0002 | 0.00121 | -0.0009** | -0.0056 |
| Income level 1 (Poorest 20%) | -1.5528* | 0.0068* (4.25%) | -0.8837* | 0.00271** (4.21%) | -1.0309* | 0.0016 |
| Income level 2 (Second 20%) | -1.2226* | 0.0041** (2.59%) | -0.4747*** | -0.00291 | -0.6787** | 0.0001 |
| Income level 3 (Third 20%) | -0.7564* | 0.0005 | -0.3610*** | 0.00094 | -0.3385 | 0.0004 |
| Income level 4 (Fourth 20%) | -0.5176* | -0.0006 | -0.4537** | 0.00000 | -0.4286*** | -0.0006 |
| Secondary education | 1.3540* | 0.0336* (21.08%) | 0.5139* | 0.01275* (19.81%) | 1.1716* | 0.0062*** (25.53%) |
| Tertiary education | 2.4205* | 0.0162* (10.15%) | 1.2006* | 0.01286* (19.97%) | 2.1176* | 0.0133* (54.45%) |
| Employment | 0.3550* | 0.0197* (12.36%) | 0.0311 | 0.00216 | 0.0179 | 0.0004 |
| Group(male) | | 0.3964 | | 0.37500 | | 0.0726 |
| Group(female) | | 0.2372 | | 0.31063 | | 0.0482 |
| Difference/gap | | 0.1592* | | 0.06437** | | 0.0244** |
| Unexplained gap | | 0.0741* (46.54%) | | 0.03488** (54.18%) | | 0.0057 (23.22%) |
| Explained gap | | 0.0851* (53.46%) | | 0.02949*** (45.82%) | | 0.0187 (76.78%) |
| Constant | -2.881* | | -0.605 | | -4.300* | |
| Observations | 3000 | 3000 | 943 | 943 | 2380 | 2380 |
| LR chi2(10) | 712.3 | | 59.97 | | 120.71 | |
| Prob> chi2 | 0.0000 | | 0.0000 | | 0.0000 | |

Data Source: Global Findex database, 2017.

Note: Parentheses denote the percentage in respect to total gap

***** Significance at the 1% level ** Significance at the 5% level *** Significance at the 10% level

Having a debit card does not mean that the person will use that card. Usage is more important than availability, but the likelihood of using debit cards is low for both male and female. The result shows that the gender gap falls to 6.43 percent when it is accounted for debit card usage. Differences in socioeconomic variables across gender contribute 45.82 percent of total gap and hence other unexplained characteristics have a huge contribution towards the gender gap in case of usage of the debit cards. Gender differences in secondary education and tertiary education have separately contributed about 20 percent of the gap in debit card usage.

A large number of literatures show the potential impact of reduced transaction costs achieved through mobile platforms. As reported in Table III the likelihood of using mobile or internet to access the formal account is 2.44 percent more for males than their

female counterparts. This discrepancy across gender aroseprimarily from the differences in socioeconomic characteristics which explain altogether 76.78 percent of the gap in mobile usage for accessing the formal accounts. The level of education among the females has a significant contribution to the gap and gender differences in tertiary education contribute maximum i.e. 54.45 percent of the total gap. Disparity in education is the most contributing factor to the gender gap in case of digital financial inclusion. The table –III also highlights the fact that overall gender gap is statistically significant for all the three dependent variables namely debit card holding and debit card using and using financial services through internet or mobile phone. But only for the debit card using and holding, the explained gap is significant. Socioeconomic variables explain the gap only in case of debit card holding and usage.

# 4. Conclusion

In the argument of financial inclusion, the relevance of gender discrimination has come into prominence in recent literatures. This paper analyses the evidence of a gender gap in India using individual-level data obtained from FINDEX. The empirical findings suggest that on average, women have lower access to formal finance than their male counterparts. However, the exclusion of females from financial services leads to their exclusion from social and economic activities, and also means that their potential contribution to economic growth has lost. A more robust analysis was conducted using Fairlie Decomposition technique to show in what extent the differences in socioeconomic characteristics across gender are responsible for the gender gap in financial inclusion. Variability in socioeconomic channels widely represents the gender gap for all indicators except formal borrowing. It explains total gap exclusively for formal savings. More precisely, it is observed that lower employment status among females is the foremost reason of not having a bank account, formal saving, and formal credit requirement. On the other hand, lower education among females prohibits them from using digital financial services. Exclusion of women from workforce and educationhave repercussions for their participation in formal financial sector. Policies, to expand access to financial services for the women, will not be fruitful unless the problems of these dimensions are taken care of. Only when these are solved women will reap the benefit of financial services as much as men.Even if the government policies are adopted targeting the women, if the disparity exists in terms ofeducation, income, employment status,women will remain financially excluded in the society.

# References


Abdu, M., Buba, A., Adamu, I and Muhammad, T. (2015) "Drivers of financial inclusion and gender gap in Nigeria"*The Empirical Econometrics and Quantitative Economics Letters (EEQEL)***4**(4), 186-199.

Abel, S., Mutandwa, L and Le Roux, P. (2018) "A Review of Determinants of Financial Inclusion"*International Journal of Economics and Financial Issues*, ISSN: 2146-4138

Allen, F., Carletti, E., Cull, R., Qian, J., Senbet, L & Valenzuela, P. (2012) "Resolving the African Financial Development Gap: Cross-Country Comparisons and a Within-Country Study of Kenya" NBER Working Paper 18013. Cambridge, MA: National Bureau of Economic Research.

Ashraf, N., D. Karlan and W. Yin (2010)"Female Empowerment: Impact of a Commitment Savings Product in the Philippines" *World Development* **38**, 333344.

Aterido, R., Beck, T&Iacovone, L. (2013) "Access to Finance in Sub-Saharan Africa: Is There a Gender Gap?" *World Development***47**, pp. 102-120.

Bauer, T. K and Sinning, M. (2008) "An extension of the Blinder–Oaxaca decomposition to nonlinear models"*Advances in Statistical Analysis***92**, 197–206.

Deléchat, C., Newiak, M., Xu, R., Yang, F and Aslan, G. (2018) "What is Driving Women's Financial Inclusion Across Countries?" International Monetary Fund Working Paper No. 18/38, ISBN: 9781484344460.

Demirguc-Kunt, A., Klapper, L., Singer, D. (2013) "Financial Inclusion and Legal Discrimination Against Women: Evidence from Developing Countries"Policy Research Working Paper 6416. The World Bank, Washington, DC.

Demirgüç-Kunt, Asli, LeoraKlapper, Dorothe Singer, Saniya Ansar and Jake Hess. (2018) "The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution" Washington, DC: World Bank. doi:10.1596/978-1-4648-1259-0.

Dupas, P and Robinson, J. (2013) "Why don't the poor save more? Evidence from health savings experiments"*American Economic Review***103**(4), pp. 1138-1171.

Ellis, K, Lemma, A and Rud, Juan-Pablo. (2010) "Financial Inclusion, Household Investment and Growth in Kenya and Tanzania" ODI Project Briefing No 43, London: Overseas Development Institute.

Fanta, Ashenafi B., Mutsonziwa, Kingstone. (2016) "Gender and Financial Inclusion: Analysis of financial inclusion of women in the SADC region" Policy research paper No. 01/2016.

Fairlie, Robert W. (1999) "The Absence of the African-American Owned Business: An Analysis of the Dynamics of Self-Employment" *Journal of Labor Economics***17**(1), 80-108.

Fairlie, Robert W. (2006) "An Extension of the Blinder-Oaxaca Decomposition Technique to Logit and Probit Models" IZA Discussion Papers 1917, Institute for the Study of Labor (IZA).

Ghosh, S& Vinod, D. (2016) "Furthering the Financial Inclusion Agenda in India: How Important Is Gender?" *Economic & Political Weekly***51**(12), 126-32.

Ghosh, S& Vinod, D. (2017) "What Constrains Financial Inclusion for Women? Evidence from Indian Micro data"*World Development (2017)*, http://dx.doi.org/10.1016/j.worlddev. 2016.11.011

Haddad, L., Hoddinott, J& Alderman, H. (Eds.) (1997) "Intra household resource allocation in developing countries" Baltimore, MD and London: Johns Hopkins University Press.

Handa, S& Davis, B. (2006) "The experience of conditional cash transfers in Latin America and the Caribbean"*Development Policy Review***24**(5), 513–536.

Hashemi, S., Sidney, R. Schuler& Ann, P. Riley. (1996) "Rural Credit Programs and Women's Empowerment in Bangladesh"*World Development***24**(4), 635–653.

Oaxaca, R. L and Ransom, M. R. (1994) "On discrimination and the decomposition of wage differentials" *Journal of Econometrics* **61**, 5–21.

Rangarajan, C. (2008) "Report of the Committee on Financial Inclusion" RBI.

Rawlings, L., Rubio, G. (2005) "Evaluating the impact of conditional cash transfer programs" The World Bank Research Observer**20**(1), 29–55.

Swamy, Vighneswara. (2014). "Financial Inclusion, Gender Dimension, and Economic Impact on Poor Households"*World Development***56**, 1–15.

Sinning, M& Hahn, M & Bauer, T. K. (2008) "The Blinder–Oaxaca decomposition for nonlinear regression models" *The Stata Journal* **8**(4), pages 480-492.

StataCorp. (2017)*Stata 15 Base Reference Manual*, College Station, TX: Stata Press.

StataCorp. (2017)*Stata Statistical Software: Release 15*, College Station, TX: StataCorp LLC

Thomas, D. (1990). "Intra-household resource allocation: An inferential approach"*The Journal of Human Resources***25**(4), 635–664.

World Bank. (2014) “Global Financial Development Report 2014: Financial Inclusion (Rep.)” Washington, DC: World Bank.

World Bank. (2018) “India -Global Financial Inclusion (Global Findex) Database 2017” The World Bank, Washington, DC

Zins, A., Weill, L. (2016) “The determinants of financial inclusion in Africa”*Review of Development Finance***6**(1), 46-57.

# Appendix

**Table A.I: Statistical Significance of Gender Gap in Respondent's Age (t-test)**

| Group | Obs. | Mean | Std. Err. | Std. Dev. | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|
| | | | | | | |
| Male | 1453 | 37.4033 | .4162049 | 15.865 | 36.58688 | 38.21973 |
| Female | 1547 | 37.45637 | .3820695 | 15.02753 | 36.70694 | 38.2058 |
| | | | | | | |
| Combined | 3000 | 37.43067 | 0.281826 | 15.43625 | 36.87807 | 37.98326 |
| Difference | | -0.05306 | 0.564981 | | -1.160859 | 1.054732 |
| | | | | | | |
| diff = mean(0) - mean(1) | | | | | t = -0.0939 | |
| Ho: diff = 0 | | | Satterthwaite's degrees of freedom = 2957.67 | | | |
| | | | | | | |
| Ha: diff < 0 | | Ha: diff != 0 | | | Ha: diff > 0 | |
| Pr(T < t) = 0.4626 | | Pr(\|T\| > \|t\|) = 0.9252 | | | Pr(T > t) = 0.5374 | |

Data Source: Global Findex Database, 2017

**Table A.II: Statistical Significance of Gender Gap in Respondent's Age-Square (t-test)**

| Group | Obs. | Mean | Std. Err. | Std. Dev. | [95% Conf.Interval] | |
|---|---|---|---|---|---|---|
| | | | | | | |
| Male | 1453 | 1650.532 | 36.34989 | 1385.594 | 1579.228 | 1721.836 |
| Female | 1547 | 1628.66 | 33.0794 | 1301.076 | 1563.775 | 1693.545 |
| | | | | | | |
| Combined | 3000 | 1639.253 | 24.5105 | 1342.495 | 1591.194 | 1687.312 |
| Difference | | 21.87202 | 49.14836 | | -74.49652 | 118.2406 |
| | | | | | | |
| diff = mean(0) - mean(1) | | | | | t = 0.4450 | |
| Ho: diff = 0 | | | Satterthwaite's degrees of freedom = 2951.57 | | | |
| | | | | | | |
| Ha: diff < 0 | | Ha: diff != 0 | | | Ha: diff > 0 | |
| Pr(T < t) = 0.6718 | | Pr(\|T\| > \|t\|) = 0.6563 | | | Pr(T > t) = 0.3282 | |

Source: Global Findex Database, 2017

The result of t-test denotes that there is no significant differencebetween female respondent's age and male respondent's age and no significant differences between female respondent's age square and male respondent's age square.

**Table A.III: Chi-Square Test of Association between Gender and Discrete Explanatory Variables.**

| Explanatory Variables | | | | | |
|---|---|---|---|---|---|
| **A. Income Level 1 (Poorest 20%)** | | | | | |
| Gender | Income level 1 dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1211 | 242 | 1453 | 4.517 | .034 |
| Female | 1243 | 304 | 1547 | | |
| Total | 2454 | 546 | 3000 | | |
| **B. Income Level 2 (Second 20%)** | | | | | |
| Gender | Income level 2 dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1187 | 266 | 1453 | 3.786 | .052 |
| Female | 1220 | 327 | 1547 | | |
| Total | 2407 | 593 | 3000 | | |
| **C. Income Level 3 (Third 20%)** | | | | | |
| Gender | Income level 3 dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1153 | 300 | 1453 | .591 | .442 |
| Female | 1245 | 302 | 1547 | | |
| Total | 2398 | 602 | 3000 | | |
| **D. Income Level 4 (Fourth 20%)** | | | | | |
| Gender | Income level 4 dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1147 | 306 | 1453 | 2.107 | .147 |
| Female | 1254 | 293 | 1547 | | |
| Total | 2401 | 599 | 3000 | | |
| **E. Secondary Education** | | | | | |
| Gender | Secondary dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 953 | 500 | 1453 | 59.392 | .000 |
| Female | 1210 | 337 | 1547 | | |
| Total | 2163 | 837 | 3000 | | |
| **F. Tertiary Education** | | | | | |
| Gender | Tertiary dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1332 | 121 | 1453 | 21.932 | .000 |
| Female | 1482 | 65 | 1547 | | |
| Total | 2814 | 186 | 3000 | | |
| **G. Employment Status** | | | | | |
| Gender | Employment dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 372 | 1081 | 1453 | 377.7500 | .000 |
| Female | 941 | 606 | 1547 | | |
| Total | 1313 | 1687 | 3000 | | |

Source: Global Findex Database, 2017

Note: Explanatory variables taking the value 1, indicating “yes” and taking the value 0, indicating “no”

Education level, employment status and income level,other than income level 3 and income level 4, are significantly associated with gender.

**Table A.IV: Chi-Square Test of Association between Gender and Dependent Variables.**

| Dependent Variables | | | | | |
|---|---|---|---|---|---|
| **A. Formal Account** | | | | | |
| Gender | Account dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 255 | 1198 | 1453 | 16.695 | .000 |
| Female | 365 | 1182 | 1547 | | |
| Total | 620 | 2380 | 3000 | | |
| **B. Formal Savings** | | | | | |
| Gender | Savings dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1140 | 313 | 1453 | 11.827 | .001 |
| Female | 1290 | 257 | 1547 | | |
| Total | 2430 | 570 | 3000 | | |
| **C. Formal Borrowing** | | | | | |
| Gender | Borrowing dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1332 | 121 | 1453 | 14.241 | .000 |
| Female | 1471 | 76 | 1547 | | |
| Total | 2803 | 197 | 3000 | | |
| **D. Debit Card Holding** | | | | | |
| Gender | Debit card dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 877 | 576 | 1453 | 88.095 | .000 |
| Female | 1180 | 367 | 1547 | | |
| Total | 2057 | 943 | 3000 | | |
| **E. Debit Card Usage** | | | | | |
| Gender | Debit card usage dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 360 | 216 | 576 | 4.084 | .043 |
| Female | 253 | 114 | 367 | | |
| Total | 613 | 330 | 943 | | |
| **F. FI Account Access Using Mobile Phone or Internet** | | | | | |
| Gender | Mobile & Internet access FI dummy | | | | |
| | 0 | 1 | Total | Pearson Chi-Square (1) | Asymp. Sig. |
| Male | 1111 | 87 | 1198 | 6.230 | .013 |
| Female | 1125 | 57 | 1182 | | |
| Total | 2236 | 144 | 2380 | | |

Source: Global Findex Database, 2017
Note: Binary dependent variables taking the value 1, indicating “yes” and taking the value 0, indicating “no”

Three main indicators of financial inclusion and indicators of digital financial services are significantly associated with gender.