Examining The Factors Affecting Digital Adoption of Financial Services: Evidence From the BRICS Economies

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Introduction

India has experienced substantial economic growth over the past few decades, with its GDP growing at an average rate of around 6-7% per year[1]. This growth is driven by a combination of a large, young population, a growing service sector, and significant improvements in infrastructure and industrial capabilities. Technological advancements, particularly in information technology and telecommunications, have also contributed significantly to economic growth. However, despite this rapid economic expansion, financial inclusion in India remains a challenge.

There is widespread evidence that financial inclusion is an important enabler of inclusive economic growth. Financial inclusion refers to the process of ensuring that individuals and businesses, regardless of their economic status or location, have access to useful and affordable financial products and services. These services include banking, credit card, insurance, and digital payments. Despite rapid development over the last decade, financial inclusion still remains a global challenge. Over 1.4 billion adults remain unbanked, particularly regions like Sub-Saharan Africa and the Middle East[2]. Within these economies, women, rural populations, and low-income households are disproportionately excluded due to factors like lack of documentation, high costs, and limited financial literacy

According to the Global Findex Database 2017, about 80% of Indian adults have a bank account, but the usage of these accounts remains low. Many accounts are inactive, and the penetration of financial services in rural and remote areas is still limited. While digital payments have increased, especially post-demonetization in 2016, a significant portion of the population,

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[1]https://en.wikipedia.org/wiki/Economy_of_India

[2]https://www.worldbank.org/en/topic/financialinclusion/overview

particularly in rural areas, lacks access to digital financial services due to limited internet connectivity and digital literacy.

Through services such as mobile banking, internet banking, digital payments, access and use of financial services has become increasingly prevalent across large parts of the world. In remote and rural areas where traditional banks are scarce, mobile banking bridges the gap, allowing individuals to manage their finances via mobile devices. This 24/7 availability empowers users to conduct transactions, save money, and access credit anytime, eliminating the constraints of physical bank locations and operating hours. By lowering transaction costs and providing affordable banking products, mobile banking makes financial services economically viable for low-income users. Platforms like Kenya's M-Pesa and Bangladesh's bKash exemplify this impact, enabling millions to participate in the formal financial system. Moreover, mobile banking enhances financial literacy through educational tools, helping users better manage their finances. Secure and convenient, it reduces the risks associated with cash transactions.

Given this background, it is worth examining the factors that lead to the adoption of digital financial infrastructure which improves financial inclusion. The digital financial infrastructures include mobile banking, internet banking, debit and credit cards. Given that there is still a gap in financial inclusion across developing and emerging economies, this paper looks at the factors that affect the adoption of digital financial services across a few selective developing countries. For this study we choose the BRICS economy which is an intergovernmental organization consisting of Brazil, Russia, India, China, and South Africa. We use data from the Global Findex Database, a survey data conducted by the world back across 123 countries. This survey has been conducted over 4 rounds, 2011,2014,2017,2021.

Initially coined as "BRIC" by Goldman Sachs economist Jim O'Neill in 2001, the acronym represented emerging market economies expected to dominate the global economy by 2050. South Africa joined the group in 2010, making it BRICS.

The adoption of debit cards and mobile banking is influenced by various technological, economic, social, and regulatory factors. Key technological drivers include the availability of reliable mobile networks, internet connectivity, and access to affordable smartphones. Security features like encryption and biometric authentication also enhance user confidence. Economically, the affordability of services, income levels, and economic incentives play significant roles in encouraging adoption.

Literature Review

Sarma and Pais (2011) explore the relationship between financial inclusion. The authors aim to empirically identify country-specific factors associated with the level of financial inclusion and

examine whether development leads to an all-inclusive financial system. To collect data, Sarma and Pais utilized the Index of Financial Inclusion. The study finds that financial inclusion is strongly correlated with human development. Countries with high levels of human development typically exhibit higher financial inclusion.

Demirgüç-Kunt and Klapper (2012) provide an extensive overview of financial inclusion in Africa. The primary research question addresses the extent of financial inclusion in Africa and identifies the barriers to accessing financial services for both individuals and enterprises. The authors utilized the Global Financial Inclusion (Global Findex) database, which comprises survey data from over 150,000 nationally representative and randomly selected adults aged 15 and above.

Abel, Mutandwa, and Le Roux (2018) examine the determinants of financial inclusion in Zimbabwe in their research published in the. The data for the study was collected from the FinScope Consumer Survey conducted in 2014. The study found that financial inclusion in Zimbabwe is positively related to factors such as age, education, financial literacy, income, and internet connectivity.

Demirgüç-Kunt and Klapper (2012) examine the state of financial inclusion in Africa, focusing on the accessibility and usage of financial services by individuals and small to medium enterprises. the authors analyze how adults and SMEs in Africa interact with both formal and informal financial services, and identify the barriers to formal account ownership, Using the Global Financial Inclusion Indicators (Global Findex) database and World Bank Enterprise Survey data. Their findings indicate that less than a quarter of adults in Africa have an account with a formal financial institution, and many rely on informal methods for saving and borrowing.

Singh, Venkataramani, and Ambarkhane (2014) explore the role of mobile banking in promoting financial inclusion in India. They investigate how mobile banking can address the demand and supply side constraints of financial inclusion and offer a feasible solution for extending financial services to underserved populations.

Siddik, Hassan, and Sutradhar (2014), investigate the factors that influence the behavioral intention to adopt or continue using mobile banking services in Bangladesh. The authors conducted a survey in the Rangpur district of Bangladesh during May-June 2014. The study concludes that perceived financial cost is the most significant factor negatively affecting the behavioral intention to adopt or continue using mobile banking.

Elhadj Ezzahid and Zakaria Elouaourti (2021) investigate financial inclusion, mobile banking, informal finance, and financial exclusion in Morocco. The primary research question addressed in this study is: How have macroeconomic and sectoral reforms implemented in Morocco over

the last two decades influenced financial inclusion. The authors collected data through a comprehensive survey of 5,110 Moroccan adults, utilizing face-to-face interviews conducted between October and December 2017.The study finds that financial inclusion in Morocco has experienced different trends over the past two decades. From 1999 to 2004, there was a slight increase in financial inclusion, followed by significant growth from 2004 to 2012, and stabilization from 2012 to 2019. Hayashi and Klee (2003) examined the adoption of consumer payments using survey data of over 1499 individuals and found that consumers who use new technology or computers are more likely to use electronic forms of payment, such as debit cards and electronic bill payments. Hernan and Rios (2010) investigate the moderating effect of gender in the adoption of mobile banking. Using a sample of more than 600 users they find that usefulness, social norms and social risk, in this order, are the factors that influence the intention to adopt mobile banking services the most.

3. Descriptive Statistics

To conduct thorough research on the research question, I will be considering various different variables which effect financial inclusion in BRICS economy. The study uses variables such as Fin 4, 5 and 9 from the World Bank Global Findex database The study uses the 2021 round of the survey. FIN 4 represents the proportion of people in the last 12 months who have made a purchase, this is a significant factor when looking at financial inclusion especially in countries high percentage of rural areas. Fin 5 variables explore on the proportion of people who have a credit or debit card. The Fin 9 variable provides a overall outlook by giving data of the proportion of people in BRICS economy who have made use of a financial account.

Figure 1: Proportion of individuals having mobile accounts in BRICS economy
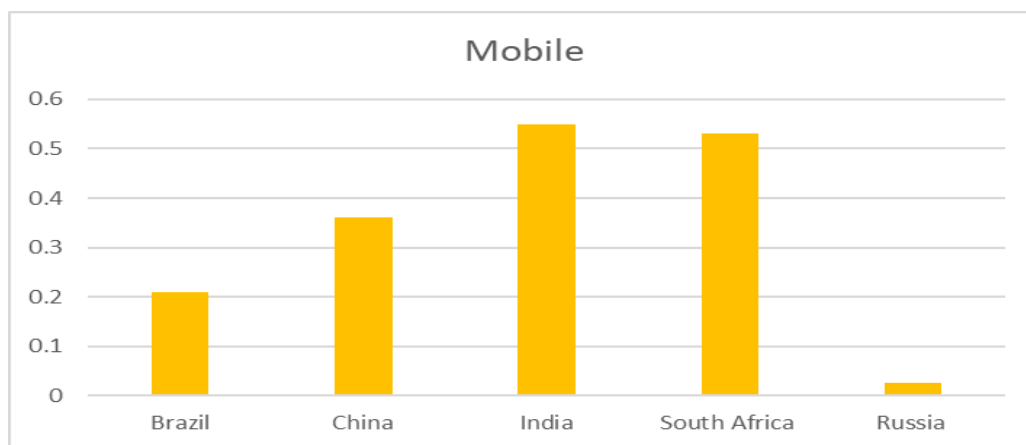
This bar chart shows the percentage of mobile account usage in different countries. India and South Africa have the highest mobile account usage, both approaching 0.5 of the population.
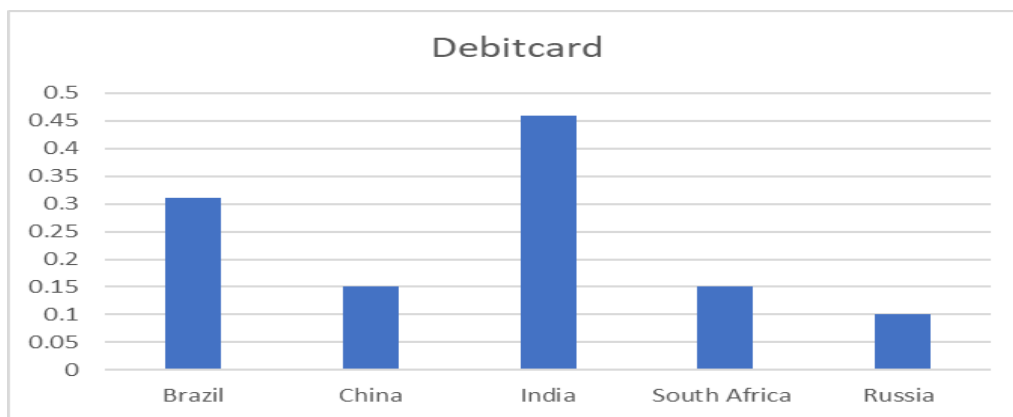
China follows at around 0.35, while Brazil has a lower usage rate near 0.25. Russia shows minimal mobile account usage.

Figure 2: Proportion of individuals having a bank account in BRICS economy
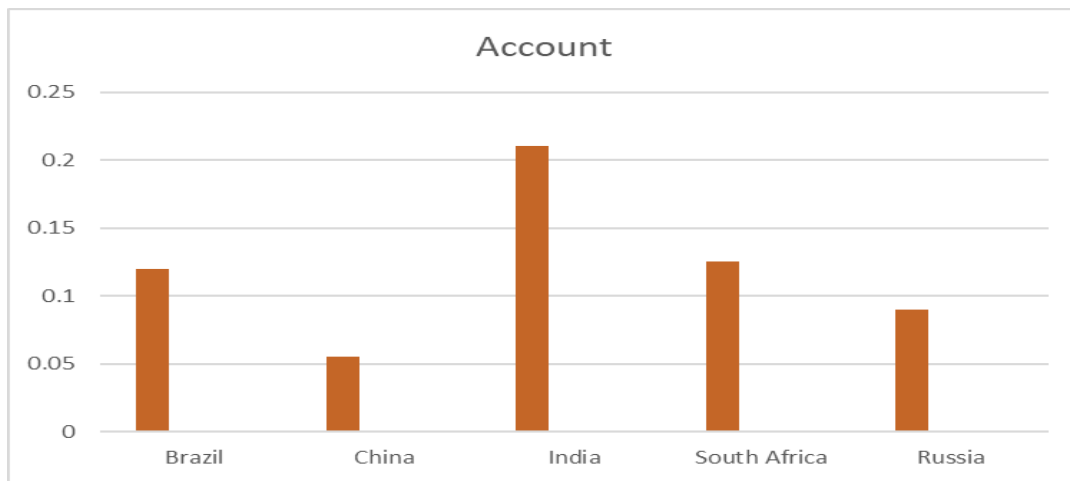
This bar chart illustrates the percentage of the population with financial bank accounts in various countries. India has the highest account ownership at about 0.2, followed by South Africa and Brazil, both near 0.1. Russia is slightly lower, while China has the lowest percentage, below 0.05.

Figure 3: Proportion of individuals of having debitcard ownership in BRICS economy

The bar chart illustrates the distribution of debit card usage across five countries: Brazil, China, India, South Africa, and Russia. India shows the highest usage at around 0.45, while Brazil follows at approximately 0.3. South Africa and China exhibit lower usage rates, with Russia

having the least. This suggests India leads in debit card adoption among the represented countries, with other nations showing varying degrees of usage.

The purpose of this study is to examine how different financial factors such as debit card ownership, financial accounts created, making deposits and mobile banking transactions have on the financial inclusion of the BRICS economies. This research will be conducted through household level data by the World Bank Global Findex database 2021. This gave detailed insights on the effect of the independent variables on financial inclusion which also differs from each economy.

4. Results and Analysis

The aim for this research was to examine the effect of the factors that lead to the adoption of digital financial infrastructure which improves financial inclusion. This research question has the goal to examine how different factors that lead to the adoption of digital financial infrastructure improve financial inclusion. The analysis of these different financial factors are the independent variables which are investigated through the World Bank Global Findex survey in 2021. The dependent variable is the proportion of people adopting digital infrastructure for financial services. Since the variables are binary in nature, we employ a logistic regression model to analyze the data.

Table 1: Effect of key independent variable on debit card ownership

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Logistic regression                          Number of obs    =      8,857
                                             LR chi2(6)       =     576.98
                                             Prob > chi2      =     0.0000
Log likelihood = -5452.1412                  Pseudo R2        =     0.0503
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fin2debitc~p	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf. Interval]	
female	.9965993	.0461812	-0.07	0.941	.9100745	1.09135
age	1.004131	.0017214	2.40	0.016	1.000763	1.00751
educ	1.429064	.0497312	10.26	0.000	1.334842	1.529936
inc_q	.9518657	.0167372	-2.81	0.005	.9196202	.9852418
account_fin	1	(omitted)				
fin9makede~s	.5076134	.0286681	-12.01	0.000	.454423	.5670296
fin10Withd~n	.7525066	.0425865	-5.02	0.000	.6735012	.8407799
_cons	3.222016	.5292071	7.12	0.000	2.335179	4.445649

Table 1 illustrates the results for the association between the independent variables and debit card ownership. The results illustrate that age, education, and income have a positive and significant association with the dependent variable (p-value < 0.05), leading to a higher odds of debit card ownership. Thus, as the age of the individual increases, the higher the level of education, and the larger the income level, the larger is the chance of an individual owning a debit card. Furthermore, if the individual has made a deposit or withdrawn money, the larger is the chance of the individual owning a debit card.

Table 2: Effect of key independent variable on mobile payment transaction

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Logistic regression                              Number of obs    =       8,857
                                                 LR chi2(6)       =     3184.54
                                                 Prob > chi2      =      0.0000
Log likelihood = -4277.6288                      Pseudo R2        =      0.2713
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fin5mobile~n	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf. Interval]	
female	1.221837	.0659491	3.71	0.000	1.099181	1.358179
age	.9834993	.0019455	-8.41	0.000	.9796936	.9873199
educ	2.498251	.1024131	22.33	0.000	2.305377	2.707261
inc_q	1.10795	.0222526	5.10	0.000	1.065183	1.152435
account_fin	1	(omitted)				
fin9makede~s	.2290762	.0142086	-23.76	0.000	.2028539	.2586881
fin10Withd~n	.3652093	.0228791	-16.08	0.000	.3230108	.4129207
_cons	6.760374	1.239617	10.42	0.000	4.719436	9.683925

Table 2 illustrates the results for the association between the key independent variables on mobile money transactions. In this case, all the variables have a significant effect on mobile money transactions (p-value < 0.05). The odds ratio is greater than 1 for gender, education, income. While it is less than 1 for age, those who made deposits and those who made withdrawals in the past. This result is intuitive as those who have made deposits or withdrawals in the past would use mobile for payments more sparingly. Additionally, younger individuals are more attracted towards using mobile for payment transactions as individuals who are older in age.

5. Conclusion and Limitations of the Study

The purpose of my research is to investigate the factors that influence the adoption of digital financial infrastructure, which plays a critical role in improving financial inclusion, particularly

in BRICS economies (Brazil, Russia, India, China, and South Africa). By analyzing the independent variables from the World Bank's 2021 Global Findex survey, you aim to identify the determinants and barriers that impact the usage of digital financial services. This, in turn, can help policymakers, financial institutions, and governments make data-driven decisions to enhance financial inclusion strategies.

The regression analysis reveals key factors influencing debit card ownership and mobile payment usage. For debit card ownership, age, education, and income have a positive and significant association, indicating that older individuals with higher education levels and greater income are more likely to own a debit card. Additionally, individuals who have made deposits or withdrawals are more inclined toward debit card ownership. In contrast, mobile payment usage is influenced differently: while gender, education, and income positively impact mobile payment transactions, age has a negative effect, suggesting younger individuals are more attracted to mobile payments. Furthermore, those who have previously made deposits or withdrawals are less likely to rely solely on mobile payments, possibly due to the use of alternative payment methods. Overall, the findings highlight that demographic factors and financial behaviors significantly shape preferences for debit card ownership and mobile payment transactions.

To successfully find insights and results in this research I have made best use of accuracy and different types of data to gain results. However, this research still has limitations which may have made the results less accurate. For this research we could have taken advantage of the vast data available in the Global Findex database by taking a variety of different years instead of just 2021. Another way we could have taken advantage of the Global Findex is to look at other ways for digitalization such as internet connectivity in households, smartphone ownership etc. Additionally, the choice of the year 2021 could have also resulted in a few inaccurate insights because this was the year right after the covid 19 pandemic broke out. This forced the whole world to go digital because of the physical restrictions placed in countries. This forced many economies to adopt digital modes for everything and everyday tasks reducing financial inclusion than normal.

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