Examining Digital Finance Service as an Instrument for Financial Inclusion in Nepal

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Abstract

Financial inclusion is one of way to raise income and make inclusive economic development in all segments of the society. One of the good ways to expand financial inclusion is to adopt technological path which has potential to broaden the existing inclusion status. Nepal is gradually building infrastructure on Information and communication technology and formulating technology-oriented policies thereby creating digital base, creating new set of opportunities for development and financial Inclusion as well. The paper analyses relevant data on digital technology, financial access and financial products and services from secondary sources. Using multiple regression, this study found significant and positive relation between mobile and internet access on number of deposit accounts used as proxy for financial inclusion. The finding of this study is in favour of to promote mobile and internet usage by more and more population to improve financial inclusion.

Keywords: digitalization, financial services, financial inclusion, multiple regression

Introduction

Financial inclusion is described as the access and use financial services with the goal of delivering relevant and beneficial financial services and products to weaker section and low-income segments of the population. It is being adopted as development instrument across the globe for individuals, businesses and government in all categories of economy. Demirguc-Kunt et. al (2017) Financial inclusion means the adult population of the society have an access to relevant financial services as per their convenience and affordability. It aims to bring people from the deprived section to formal financial system allowing them to manage investment and financial risk.

Financial access is known to tackle the poverty and boost financial gains upgrading the economic status of the nations. Hence the policy makers, governments and multilateral

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institutions like WB, IMF have been emphasizing financial inclusion-based policies to achieve inclusive and sustainable growth. Pant (2016)Financial Inclusion can be used as vehicle for arriving inclusive economic growth in Nepal. Policies related to Bank and financial literacy, financial access, digital financial services, technological infrastructure, bank account uses can improve financial inclusion, which can also be an effective tool for Nepal to attain sustainable development goals and make Nepal middle income country by 2030.

According to global index database 2017, only 45% adult Nepalese have bank accounts, which indicates the big eligible population is excluded from financial services which is also the case for many developing nations. Siddiket al. (2014) Approximately, fifty percent of the global population have no access to formal financial services. Hence, developing nations needs to make financial services accessible, affordable, secured and convenient along with appropriate financial literacy.

Digital technology can be considered a milestone for improving financial access due to its potential of remote connectivity and convenience. Ozili (2018) Digital financial inclusion is said to happen when excluded and underserved people operate bank accounts via digital channel. Given the mobile phone and internet access to the excluded population, digital finance has positive effect on access to formal financial services. Digital Financial Technology aims to reduce the time and cost for using financial services over the existing products by using digital platforms. The Government, digital finance service providers and users all have several benefits from digital financial inclusion, like stimulating government aggregate expenditure, reducing cost of intermediation, improving access and reaching low-income category as such it benefits the economy as a whole. Cuesta et al. (2015) Banks by opting digitalization in their services can stay ahead in the competitive sphere and address changing customers' preferences.

Nepal government has been working on digital strategy and infrastructures like fiber broadband and 5G to digitally connect the nation which reciprocates different economic segments. Giri (2018) Nepalese Government has conceptualize Digital Nepal Framework 2019, to emphasize eight domains, agriculture, health, education, energy, tourism, digital foundation, tourism, finance and urban infrastructure along with eighty

initiatives to use digitalization as a tool for economic growth and e-governance. The framework and its plans will lead Nepal to become a digital nation.

According to world development report 2016, more household own mobile phone than electricity or water in developing economy. The Global Findex Database 2017 portrays, 79 percent of adult population in developing economy own mobile phone. The data taken in this study shows that mobile subscription has increased by 28 % and internet by 79 % in the study period from 2016 to 2021. These facts give good platform for digital finance to promote financial inclusion and access for developing countries including Nepal. Akhter and Khalily (2017) Financial products as well as institution has been transformed by Smartphone and internet. Its main advantage is access for excluded poor, micro and small entrepreneurs thereby improving economic growth and decreasing poverty. The mobile financial services have made a massive growth in South Asia making the financial services accessible in mountains and other geographically challenging area. Kemal (2019) Mobile Banking is based on digital technology which paves a way for anywhere anytime financial services. Reach of this technology creates an opportunity to improve financial inclusion.

Digital finance provides alternative delivery channel to access and improve the financial services. Lenka and Barik (2018) It is a problem of poor population of many countries to be excluded from financial services. The increase in mobile phone together with the internet has created space for modern financial services such as e-banking, money transfer, and payment processing. These new channels have potential to provide basic financial services to the general people. Durai and Stella (2019) Digital finance is delivery of financial services through mobile phone, internet, cards which are linked with digital payment system. Convenient, low cost, timely, and suitable digital finance brings financial change in day-to-day life of people and it has positive effect in promoting financial inclusion.

Growing number of mobile penetrations and internet access facilitating increasing use of digital solution in every sphere of daily life by adult Nepalese people is embracing Nepal in digital track. The increase in number of mobile banking user from 1.75 to 12.68 million i.e., more than seven times in past 6 years demonstrates the scope of digital solution adoption in Nepal. Like many of the developing countries have been doing,

Nepal can use digital infrastructure not just for broadening financial services but strengthening financial system as a whole. Hence, it is important to take this change as an opportunity as many of the developed and developing countries have set benchmarks by utilizing digital technology.

On the ground of above information, this study examines the potential of digitalization vehicles mobile and internet on promoting financial inclusion in Nepal. With this introductory context, the second section presents literature review and section three provides methodology adopted in this study. This is followed by discussion and data analysis in Section four. The final section concludes with brief policy inferences.\

Literature Review

The literature has been reviewed to provide an overview of application of mobile, internet and fintech to promote digital financial inclusion. It also highlights the socio-economic benefits of digital financial inclusion.

Ozili (2018) focused on digital finance and its application as important factor for financial inclusion and financial stability. Fintech providers by digitizing financial services has been creating positive environment for financial inclusion in all for forms countries regardless of their economic status. The most differentiating factor of digital finance over traditional banking institutions has been convenience and affordability that low- and variable-income category people obtain from digital services.

Vasiljeva and Lukanova (2016) focused on banks investment and uses of digital and information technology. Analysis of big data, studying information about customer and their transaction, making business procedures online will enable banks to improve service efficiency and customer delight.

Gomber et al. (2018) Technology and process innovation in the financial services is continuous process leading the formation of new business models and customer friendly experience. Major findings of the study are (i) It is appropriate for the larger existing firms to outsource financial technology than to build in-house to compete with fresh start-ups.ii) Fintech sector will probably mature like an ordinary industry with the noteworthy adjustment and evolution over the period of time.

Pant (2016) focused on several policies and programs Nepal have formulated to achieve desired level of financial inclusion which is yet to be visible especially in the

villages, poor and economically dependent section of the society. Financial literacy, using bank accounts and technology based financial services, remodeling business plans, emphasis on the role of micro finance institutions, formulation and implementation of appropriate policies by government and Nepal Rastra Bank (NRB) is likely to promote financial inclusion in Nepal.

Shrestha (2020) The Findex data (for 2017) shows that majority of Nepali population is unbanked, adults' population having bank accounts comprises 45%. Thus, financial inclusion measured as access to and use of financial services, holds important economic meaning in emerging and developing countries where large section of people does not have financial access. Both the demand and supply side factors are responsible for financial inclusion.

Lenka and Barik (2018) The increased use of mobile and internet in SAARC countries has increased financial access thereby increasing financial inclusion. Moreover, the improvement in education and income has positive impact in financial inclusion however the rural population and unemployment are adversely related with the financial inclusion.

D'Souza (2018) Mobile banking enable users to route all the day to day transactions via bank account creating base for saving and credit especially for low-income category. Lowering Transaction cost, digital literacy and training, knowing the financial need and situation prospective user, ensuring authorize use of data facilitates mobile banking in financial ecosystem.

Gabor and Brooks (2017) The discussion paper studies the digital financial inclusion as a facilitator for economic development which could be undertaken by the state organizations, philanthropic investment and Fin-tech companies. The paper conveys that the digital revolution gives the nations innovative methods to increase financial at national as well as global level and also turns the poor household into financial asset generators.

Akhter and Khalily (2017) The working paper suggest that role of Banking and Financial Institutions in terms of financial service access can be expanded if the mobile banking is added in the service portfolio. The institutions participating in the mobile

financial services should invariably be regulated considering the security and operational issue.

Kandpal and Mehrotra (2019) The participation of unbanked rural population in the financial main stream have increased due to the regulatory efforts of government. Mobile lead financial service solutions are being introduced by the startups as well as regular banks to improve financial access and make payments more efficient. The government programs to digitalize economy will make more digital financial innovations and introduce more fresh players.

Fanta et al. (2016). The paper examined the elements of mobile money service subscription and its connection with financial inclusion. It recommends for expansion of mobile phone penetration and telecommunication infrastructure. The mobile based services should be extended to remote people and make the service user friendly. Further technology based financial education and launching of innovative mobile based financial services will be important for access to saving, credit and insurance.

The literature review shows that there are various socio-economic benefits financial inclusion delivers to the individual, society and country as a whole. Study of financial inclusion through digital finance is not new. Many empirical and descriptive studies have been carried out in developed countries as well as in our neighboring countries regarding the association of digital technology especially mobile banking and fintech on financial inclusion. Most of these studies shows that mobile, internet and related financial technology has lowered transaction cost, improved saving and credit and enhanced financial access for unbanked and underbanked population. However, the study on nature of relationship between digitalization propellers like internet access and mobile penetration on financial inclusion in Nepal is found negligible compared to other countries.

Research Gap

Financial inclusion is an important key for sustainable economic development and growth by the delivery of appropriate financial products and services to the excluded population. Nepal aspires to become middle- income country by 2030, for this financial inclusion and access is required to tackle poverty and raise peoples' income. Consistence in this technological and digitalization era Nepalis having more and more internet access,

mobile phone penetration and digital platforms in past ten years. With the aid of technology and digitalization, financial services have been made accessible to the underbanked and unbanked population in the developed as well as developing countries. The few recent Nepalese studies on financial inclusion have been made to prescribe the appropriate policy to the authorities where the digital financial services have occupied reasonable space in their recommendations. On this context this study attempts to show the relationship between digital financial services and financial inclusion in Nepal.

Objectives of this Study

To examine the current status of financial inclusion in Nepal.

To examine association between digitalization and Financial Inclusion in Nepal.

Research Methodology

This section of the study is focused to determine whether digitalization promotes financial inclusion by the analysis of relevant secondary data. The present study takes number of deposit account as a dependent variable as an indicator of financial inclusion and independent variables are internet access and mobile subscriptions in Nepal. The data was collected from secondary sources from Report of NRB (Nepal Rastra Bank), Ministry of Finance, Nepal Telecommunication Authority Government of Nepal, Research Articles, Research Journals. Based on availability the data was collected from mid-July 2016 to mid- January 2021 on quarterly basis. Multiple regression analysis has been used as a main statistical tool to establish an empirical relationship between digital proxies (internet access and Mobile Subscription) and Financial Inclusion in Nepal. This is presented by the equation below.

$$Y= b_0+ b_1X_1 + b_2X_2 + U$$

Where, Y=Number of deposit accounts

X_1=Number of Mobile Subscriptions

X_2=Number of Internet access

Financial Inclusion in Nepal

Pant (2016) stated that central bank and Government of Nepal has been encouraging financial inclusion in Nepal as a catalyst in economic growth and development. Nepal Rastra Bank introduced five- year strategic action plan (2012-2016) to enhance financial inclusion as strategic priority. Since then, many policies have been

prescribed to improve financial inclusion. Similarly, monetary policy, Banks and Financial Institution Act, have been emphasizing financial inclusion in Nepal. Shrestha (2020) Efforts to expand financial inclusion was made by Government of Nepal (GON) and NRB by establishing credit cooperatives, deprived sector credits, group guarantee schemes, expanding branches of banks, establishing Rural Self Reliance Fund and Rural Development Banks. Recent focus has been on digitalization of financial services and financial literacy.

Table 1 demonstrates uses of digital medium in financial transaction as well as financial access situation, the data is furnished by Global Findex, World Bank. Account holding population above fifteen years has grown significantly from 25 to 45 percentage in the year 2011 to 2017. The borrowing to expand farm or business has increased considerably from 8 in 2014 to 14 percentage in 2017. Similarly, 2 percentage of people began to use internet services to pay bills or to buy online since 2017 which was negligible prior to the year. Debit card ownership showed consistent growth. The use of mobile or internet sharply came to 7% in 2017. This table portrays that there is plenty of space for enhancing access and usage of digital financial services.

Table 1
Nepalese Database Relating to Digital Financial Access

Indicators	Year	Data
Account Holding (%age 15+)	2011	25
	2014	34
	2017	45
Borrowed to start, operate, or expand a farm or business (% age 15+)	2011	-
	2014	8
	2017	14
Used the internet to pay bills in the past year (% age 15+)	2011	-
	2014	-
	2017	1%
Used the internet to pay bills or to buy something online in the past year (% age 15+)	2011	-
	2014	0
	2017	2%
Used the internetto buy something online in the past year (% age 15+)	2011	-
	2014	0
	2017	2%
Debit card ownership (% age 15+)	2011	4
	2014	7
	2017	9
Made digital payments in the past year (% age 15+)	2011	0
	2014	6
	2017	9%

Received digital payments in the past year (% age 15+)	2011	0
	2014	7
	2017	11%
Used a mobile phone or the internet to access a financial institution account in the past year (% with a financial institution account, age 15+)	2011	-
	2014	-
	2017	7

Source. Global Findex Database 2017

Table 2 and figure 1 shows the data from NRB regarding number of accounts opened from mid-July 2016 to mid-January 2021 and digital products subscribed in the corresponding period. The number of accounts has been increasing by remarkably good number each year, it has almost doubled since 2016 compared with 2021. The mobile banking subscribes has increased more sharply than number of accounts each year, the subscribers has almost increased by more than six times since 2016 compared with 2021. Similarly, internet banking customers have also been doubled in 2021 compared with 2016 data. The debit card holders have also consistently increased with increase in number of accounts. As per below data there has been excellent growth in the mobile banking subscribers compared with other digital products.

Table 2

Number of Digital Products Subscribed in Accounts

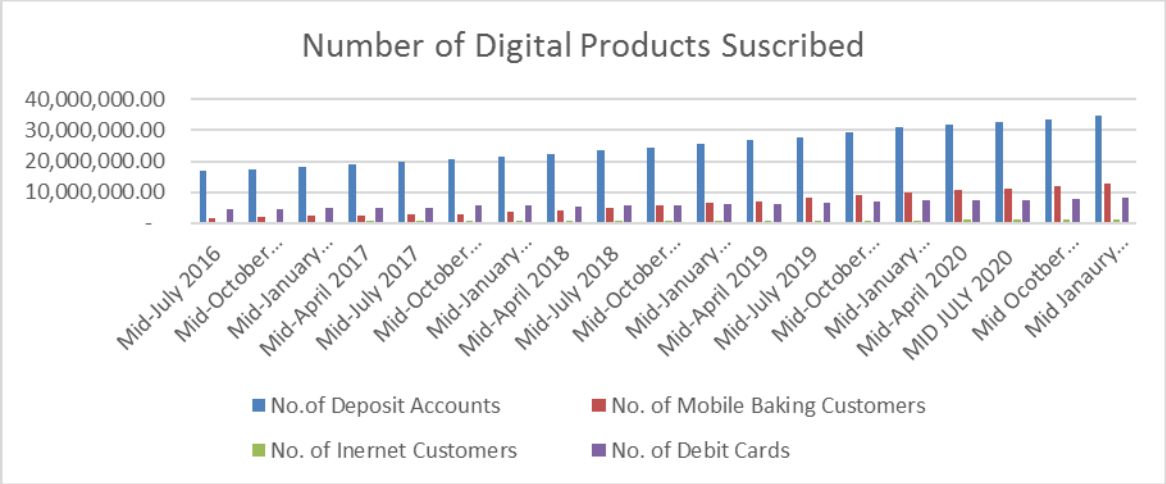
Time	No. of Deposit Account	Mobile Banking customers	Internet Banking Customer	No. of Debit Cards
Mid-July 2016	16,836,017.00	1,754,566.00	515,465.00	4,657,125.00
Mid-October 2016	17,519,287.00	1,924,946.00	534,372.00	4,671,227.00
Mid-January 2017	18,206,724.00	2,236,074.00	564,128.00	4,848,053.00
Mid-April 2017	18,843,605.00	2,426,681.00	734,924.00	5,108,213.00
Mid-July 2017	19,754,036.00	2,669,732.00	783,751.00	4,980,958.00
Mid-October 2017	20,507,612.00	2,986,669.00	667,967.00	5,583,900.00
Mid-January 2018	21,498,903.00	3,530,227.00	842,431.00	5,769,218.00
Mid-April 2018	22,500,069.00	3,999,803.00	784,286.00	5,207,598.00
Mid-July 2018	23,544,859.00	5,086,069.00	834,302.00	5,544,253.00
Mid-October 2018	24,351,485.00	5,827,289.00	791,740.00	5,854,167.00
Mid-January 2019	25,658,387.00	6,394,916.00	856,695.00	5,962,838.00
Mid-April 2019	26,910,480.00	6,998,924.00	892,859.00	6,281,427.00
Mid-July 2019	27,866,505.00	8,347,187.00	917,344.00	6,708,521.00
Mid-October 2019	29,269,631.00	9,099,732.00	928,709.00	6,919,602.00
Mid-January 2020	31,112,194.00	9,806,237.00	969,055.00	7,215,646.00

Time	No. of Deposit Account	Mobile Banking customers	Internet Banking Customer	No. of Debit Cards
Mid-April 2020	31,885,779.00	10,670,072.00	992,724.00	7,243,153.00
Mid July 2020	32,454,204.00	11,306,797.00	1,031,227.00	7,329,202.00
Mid October 2020	33,531,787.00	11,912,813.00	1,061,340.00	7,669,827.00
Mid-January 2021	34,671,949.00	12,689,445.00	1,090,332.00	8,049,059.00

Source. Nepal Rastra Bank, Banks and Financial Institution Regulation Department

Figure 1

Digital banking products suscribed in accounts



Data Analysis

There are number of financial inclusion indicators, however population having bank account is frequently used as most suitable indicator of financial inclusion. Demirguc-Kunt et. al (2018) primary step towards financial inclusion is having bank accounts. People need to have adequate knowledge about account uses to take its full advantage. Demirguc-Kuntet. al (2017) saving accounts are the basic products beside micro-credit and insurance which lays the foundation for making digital payments, that has economic benefits to individuals and government. Figure 2 shows our dependent variable, i.e. total number of accounts opened in Nepal at A,B and C class financial institutions from Mid-July 2016 to Mid-January2021 on quarterly basis. The number has been continuously growing in the study period and the figure has almost doubled in 2021 compared to 2016.

Figure 2

Quarterly data of bank deposit accounts (Dependent Variables)

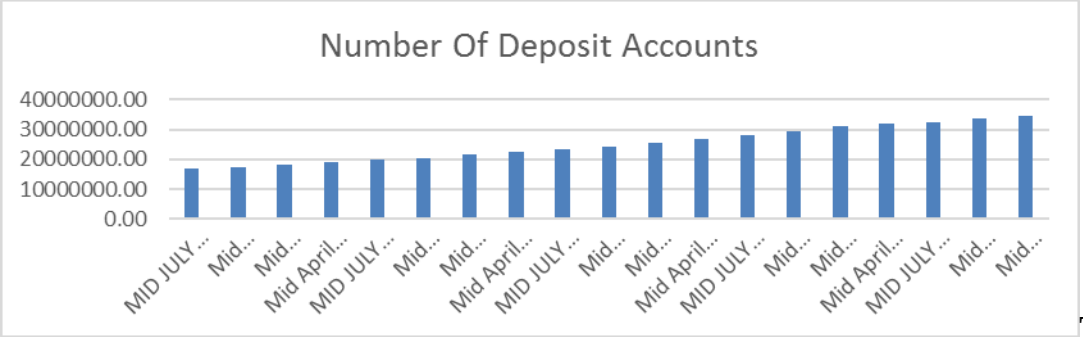


Table 3

Variables used in Study

Year	No. of Deposit Accounts	No. of Mobile Subscribed	Population having internet access
Mid-July 2016	16,836,017.00	29,762,155.00	13,784,618.00
Mid-October 2016	17,519,287.00	30,890,400.00	14,307,574.00
Mid-January 2017	18,206,724.00	32,120,305.00	14,579,889.00
Mid-April 2017	18,843,605.00	33,207,816.00	15,449,996.00
Mid-July 2017	19,754,036.00	34,172,058.00	16,186,759.00
Mid-October 2017	20,507,612.00	35,243,941.00	16,661,485.00
Mid-January 2018	21,498,903.00	36,096,396.00	16,906,869.00
Mid-April 2018	22,500,069.00	37,364,998.00	13,858,058.00
Mid-July 2018	23,544,859.00	38,339,539.00	13,378,001.00
Mid-October 2018	24,351,485.00	39,002,388.00	15,963,445.00
Mid-January 2019	25,658,387.00	39,163,433.00	16,612,211.00
Mid-April 2019	26,910,480.00	39,640,443.00	18,248,461.00
Mid-July 2019	27,866,505.00	40,596,259.00	19,441,710.00
Mid-October 2019	29,269,631.00	41,486,544.00	20,781,975.00
Mid-January 2020	31,112,194.00	42,270,309.00	21,298,011.00
Mid-April 2020	31,885,779.00	37,890,035.00	21,914,068.00
MID July 2020	32,454,204.00	37,073,662.00	22,237,567.00
Mid October 2020	33,531,787.00	37,291,897.00	23,275,728.00
Mid-January 2021	34,671,949.00	38,212,800.00	24,735,650.00

Source. Quarterly data of bank deposit accounts

Table 3 shows the dependent and independent variables used in this study.

Figure 3

Independent variables (No. of mobile subscribed and internet access

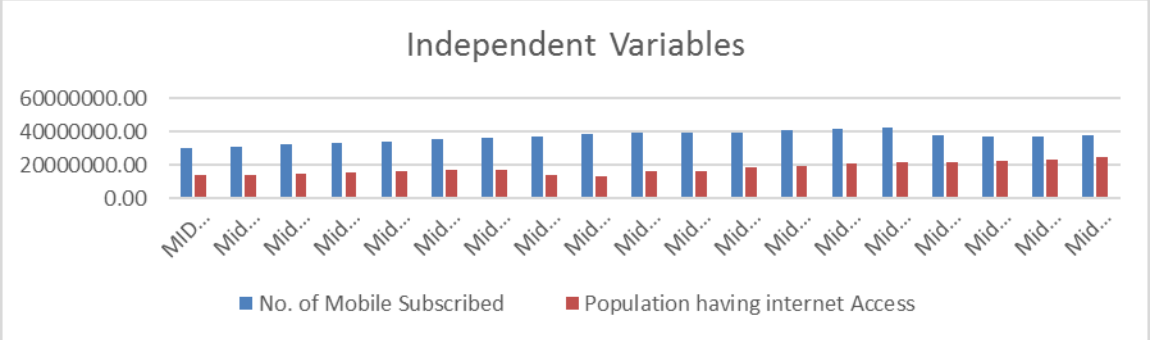


Table 4

Summary of Regression Analysis

R	R Square	Adjusted R Square	Standard Error of the Estimate
.964	.929	.920	1649150.484

Table 4 demonstrates the summery of the multiple regression analysis carried out using SPSS software version 23. The analysis shows the value of R (Multiple correlation coefficient) being .964, which demonstrates good level of prediction of number of accounts (Dependent Variables) by the application of independent variables used in the study. Similarly, the value of R square is .929, which indicates that 92.90% of the variability in dependent is explained by independent variables. Further the value of adjusted R square is .920 indicating better fit for the model.

Table 5

ANOVA Table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	568904644424396.100	2	284452322212198.060	104.590	.000
	Residual	43515157113040.805	16	2719697319565.050		
	Total	612419801537436.900	18			

a. Dependent Variable: No.of Deposit Accounts

b. Predictors: (Constant), Population having internet Access, No. of Mobile

The Table 5 shows that the independent variables significantly predict the dependent variable, since p < .0001; the regression model is a good fit of the data.

Table 6

Regression Coefficients

Variables	Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.	VIF
	B	Std. Error	Beta			
Constants	-17441031.0	4125477.520		-4.228	.001	
No. Mobile Subscribed	.571	.133	.342	4.304	.001	1.423
Population having Internet access	1.204	.130	.734	9.231	.000	1.423

The estimation of the model is presented in Table 6 as:

$Y= -17441031.0 +.571X_1+1.204X_2 + u$

Table 6 provides us the coefficients as a result of regression analysis to predict dependent variable from independent variables. The unstandardized coefficient in the table indicates how much the number of accounts (dependent variable) varies with each independent variable in the study when each of the respective independent variables are held constant with each other. Multiple regression analysis revels that unstandardized beta value of number of mobiles Subscribed and internet access is .571 and 1.20 respectively i.e., statistically for every increase of mobile subscription and internet access the number of accounts increases by .571 and 1.20 respectively. The *P* value of mobile subscription and internet subscription is <0.005, which indicates that there is a statistically significant impact on number of accounts. Further as a normal rule the VIF values of more than 5 are not acceptable in data which is considered as a sign of multicollinearity. This model is free from multicollinearity as all the VIF values are less than 5 for the independent variables considered in study.

Conclusion

This study examines digital finance as an instrument for financial inclusion in Nepal. In developing countries like Nepal, the growing number of mobile and internet penetration together are creating opportunity to expand financial inclusion due to their remote and convenient access. Demirguc-Kunt et al. (2018). In the developing world mobile network and internet have created opportunity to deliver financial services by a new channel. Even text-based mobile phone has facilitated to open and operate mobile based accounts. Given the sufficient telecommunication infrastructure mobile phones and internet plays vital role in financial inclusion. Akhter and Khalily (2017) Smartphone, cellphone and internet services have brought constructive change in the usage and accessibility of financial services. This new channel can easily reach to excluded population and helpful in expanding service in remote locations.

This study examined whether the digital finance promotes number of accounts (proxy for financial inclusion in the study) in Nepal using secondary data from Mid-July 2016 to Mid-January 2021 taken on quarterly basis. Using multiple linear regression, the present study found positive and significant impact of mobile subscription and internet access on number of accounts in Nepal.

Digital finance economically benefits the financially excluded individuals and business along with economy as a whole. Hence, the government, banks and financial institutions, fintech's and related authorities should make maximum use of digital finance and infotech as propellers for expanding financial services. To sustain the digital finance, we need to emphasis on financial education for people and businesses about its uses and benefits and establish the secured payment system.

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