European Economic Letters
ISSN 2323-5233
Vol 15, Issue 1 (2025)
http://eelet.org.uk

"Impact of Digital Financial Innovation on Economic and Sustainable Development"

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Abstract:-

Digital financial innovations are the financial services which are provided online to users. Theses innovations are the most important tool for financialy inclusion of the underpriviledged population the economy. In this paper the impact of digital financial innovation on economic and sustainable development was examined. The factors which affect the use of digital financial innovation was also identified in this paper. For checking the model fitness CFA was used and for finding out the impact of digital financial innovation on economic and sustainable development SEM was applied. The author investigated that digital financial innovations positively affect the economic as well as sustainable development of India.

Keywords:- Digital financial innovation, Digital banking services, CFA, Path Analysis, Economic development, Sustainable development

Introduction:-

Digital financial innovations refer to the services that are provided digitally i.e. online. We can use these services anytime and anywhere. In the modern era, every person is busy in their routine life and they have no time to keep standing in long queues in wait for the various transactions related to bank and also the payment of multiple bills and various recharge. Digital financial services make the lifestyle very easy and comfortable.User can make banking transactions from our homes also through mobile banking and internet banking. The ATM services are available 24 hours.

Digital financial innovation is an important tool for promoting financial inclusion(Buckley & Malady, 2015). Digital Financial System assists people lacking accessibility through the use of cutting-edge inventions, digital networks, and digital payment systems (Scott et al., 2017; David-West et al., 2018). By using online platforms, rural and under-served populations can significantly reduce costs for consumers as well as service operators (Alam & Imran, 2015; Tarhini et al., 2016). The invention and use of advanced technology has assisted many of people in defeating poverty every year. However, a large percentage of people in the entire world live in poverty as a result of a variety of problems, including ones with their health, finances, and other issues.

Economic development can be boosted in several ways by DFI. Schneider (2018) has demonstrated that if business organizations, financial institutions, and government agencies could function without depending on cash and written records, their operational efficiency would significantly increase, which would lead to a massive profit gain. Furthermore, DFI lowers the cost of financial services.

The goal of digital finance in small-scale lending is to eliminate the need for consumers to be present at the bank to finish some documentation before funds can be paid to users. Additionally, any time debts may be accessed using technologies and do not require users to be available physically at the bank (Mader et al.,2018). The benefits of integrating digital finance include providing accessibility to conventional financial services for individuals who are unable to afford them and making digital finance facilities more affordable for consumers than previously(Peric, 2015). Furthermore, with digital banking, it becomes feasible to provide users with extra financial solutions specifically catered to their requirements and budgets (Bourreau & Valletti,2015).

Digital financial services also help to reduce the likelihood of theft, burglaries, and other illegal activities activity associated with transactions involving cash and also lower expenses related to choosing private suppliers and cash transactions (Muneeza et al., 2018). New, important, and crucial participants will be invited by the online financial system. These players will include the general public, cell phone corporations, traditional financial organisations, and new technology firms (Mader et al., 2018). Several novel techniques will surface: financial technology firms giving low-income customers short-term loans, big financial technology firms obtaining official financial services permits, and more financial technology-microfinance collaborations (Mader et al., 2018). Digital finance provides firms with digital capital creation, storage, and investment options (Ozili, 2018). Since online and technological innovations were introduced, banking services have significantly advanced (Vives, 2019). People are going through effectiveness and transparency, which is significantly impacted by the online technology transformation (Liu et al. 2021).

Digital financial innovations makes it possible for those lacking banking institutions to be financially accepted into the conventional financial sector by offering financial services. By facilitating investment diversity and lowering uncertainty, digital finance tends to accelerate the banking industry's development and, consequently, performs a vital role in the development of the economy. Additionally, increases in banking services and the expansion of potential investment due to the availability of innovative and less unsafe financial tools are two ways innovative financial technologies support the process of capital formation in the economy. The crucial gain of Digital financial innovation is that it provides a track for the underprivileged members of society to access the official banking system and benefit from it.

Regardless of the present economic state, sustained growth is receiving greater emphasis from a variety of academic disciplines and nations and is accepted by entities that are governmental and non-governmental. A change in outlook for an innovative strategy and perspective is encouraged by the deteriorating surroundings, growing financial inequalities, and significant problems in society (Luo et al.,2023).

The only goal of sustained growth, which is described as an inclusiveness and prospective strategy for understanding growth, is to attain the intended societal, ecological, and economic endurance for both current and upcoming ages (Omri & Saidi, 2022). Studies on sustained growth founded on the three elements of the "economical, environmentally conscious, and societal approach" have rapidly increased during the past 20 years (Purvis et al., 2019). Sustainability has become the most crucial issue in every field for economic development of any country.

The phrase sustainable comes from the Latin language phrase sustainer which means promote, endure, upkeep, nurture, protect, etc. (Ziolo et al., 2017; Rout et al., 2020; Maqbool & Akubo, 2022). Several researchers have noted that the Western growth framework was the basis for the establishment of sustainable growth at the beginning of the 1970s (Mebratu, 1998). The original goal of sustained growth was to address the deteriorating ecology and broaden its scope to include socioeconomic variables (Jabareen, 2008).

The idea of a sustainable future is primarily presented as a discussion of how individuals act with regard to "good and bad," or "morals"(Jabareen, 2008). The moral dilemma of sustainability is that societal and economic growth shouldn't occur at the risk of the environment. According to Brundtland, 1987 growth that satisfies current demands without sacrificing those of later generations is said to be sustainable.

In summary, research highlights the potential of digital financial innovation to promote economic and sustainable development by improving access to financial services, promoting entrepreneurship and job creation, and empowering marginalized groups. Yet, it is crucial to deal with issues like the requirement for online facilities financial awareness, and laws and regulations to guarantee that online banking innovations can realize its full potential.

Review of literature:

Santos &Ponchio (2021) aimed to understand the social, psychological, and emotional hurdles that affect the use of online banking in Brazil with application of PLS- SEM approach and discovered that psychological and emotional factors positively influence the use of online banking.

Alnemer (2022) aimed to examine the elements affecting the use of online banking n Saudi Arabia with application of Chi-square test and logistics regression analysis and discovered that PEOU and PU are the most influential elements in the acceptance of online banking.

Vincenzo and Jayadi (2023) in Indonesia aimed to examine the essential elements that influence user satisfaction in using digital banking services. By using CFA they found that how customers' satisfaction with the digital bank's applications influences their decision the access online banking services.

Kanga et al., 2022 in 137 countries aimed to examine how technological innovation in finance was being adopted and how that affected financial accessibility and quality of life. By using 3SLS the study found that there was a long-term effect of technological innovations in finance and financial accessibility on per capita GDP.

Manasseh et.al,(2023) aimed to find out the effect of DFI on economic sector growth in Eastern and Southern Africa with application of ARDL and found that DFI positively affects the economy in the long term.

Daud (2023) in 84 countries aimed to examine the connection between FI, online innovation, and economic development. By using Panel data analysis he found that FI and online innovations have a favorable and considerable impact on national economic development.

Bahl et al., 2023 in India aimed to examine how technological innovation in finance was being adopted and how that affected financial accessibility and quality of life. By using PLS-SEM the study found that there was a long-term effect of technological innovations in finance and financial accessibility on per capita GDP.

Anakpo (2023) aimed to investigate the status scheme and strategy for DFI in developing countries for sustainable development in Africa with application of Descriptive statistics and found that investigated that most of the population in developing countries does not have the availability of digital financial services.

Zeraibi et al., 2023 in BRICS countries aimed to clarify the impact of FI, economic uncertainty, and capital on renewable energy and environmental quality. By using STIRPAT model they found that examined that FI and Carbon footprint, Renewable energy, and Economic Complexity have significant relationships.

Conceptual Foundation:

Perceived Usefulness of Digital Financial Innovation and Economic Development

The idea that using online financial services will benefit the customer is known as perceived usefulness (Jeong and Yoon, 2013).
From the perspective of financial inclusion, the advantages that a person perceives from having the ability to use digital banking services whenever needed are significant (Anand & Chhikara, 2013). The government has been making many efforts to make sure that the underprivileged or financially challenged groups in society receive the rewards of digital banking services (Iqbal and Sami, 2017). A wide range of facts are available through digital banking, which users may use to conveniently access a variety of financial services. We have access to financial services anytime we need to, which makes it simple and effortless. This paper found the impact of Perceived Usefulness of Digital Financial Innovation on Economic Development.

H1: Perceived Usefulness has a significant impact on Economic Development.

Perceived Easy Use of Digital Financial Innovation and Economic Development

Users are usually more likely to employ services that are straightforward, simple to understand, and simple to access. When digital banking technology is clear and simple to use, users are more likely to accept it (Chitungo and Munongo, 2013; Mortimer et al., 2015; Koksal, 2016). The first inclination of a user to accept technological advances in banking is influenced by its easy availability (Ramayah et al., 2003). The convenience of digital financial services is making it easier for clients to accept them because of their perceived ease of use (PEOU) (Kazemi et al., 2013; Jeong and Yoon,

2013; Govender and Sihlali, 2014). This paper investigated the impact of the perceived Easy to Use of Digital Financial Innovation on Economic Development

H2: Perceived Easy to Use has a significant impact on Economic Development.

Trust in Digital Financial Innovation and Economic Development

When it comes to digital financial services, trust is defined as "the conviction that permits people to voluntarily expose themselves to the bank, their communication provider, and mobile phone technology following their acquisition of the bank's and the communications operator's attributes contained within the technological object" (Masrek et al., 2012). Yousafzai et al. (2009) have recognized three distinct categories of trust, including "Bank Trust"," Trust in online sources" and " Trust in data obtained through online banking". This paper finds out the impact of Trust on Digital Financial Innovation on Economic Development.

H3: Trust has a significant impact on Economic Development.

Social Influence on the Use of Digital Financial Innovation and Economic Development

Venkatesh et al. (2003) present the definition of Social Influence(SI) as "the degree to which a person feels that significant others think they should implement the updated approach." Venkatesh et al. (2003) discussed the possibility that adherence, especially in the early phases of knowledge, may have a role in the effect of social influence on the adoption of new technology. Previous research has extensively emphasized the significant impact of social influence and related elements in boosting user attitudes and the usage of digital financial services (Al-Somali et al., 2009; Martins et al., 2014; Shih and Fang, 2004). This paper investigated the impact of Social Influence on the use of Digital Financial Innovation on Economic Development.

H4: Social Influence has a significant impact on Economic Development.

Attitude on Digital Financial Innovation and Economic Development

Allport (1935) presented his views about attitude as an experienced-organized psychological and neurological level of willingness that directs or dynamically affects how a person reacts to all elements and the circumstances that surround them. Ajzen and Fishbein (1980) cite the definition of attitudes as a person's ideas about the benefits of adopting a particular behavior and his assessment of the potential implications. The more the intention to carry out a particular behavior, the more favorable the attitude towards the behavior. This paper examined the impact of the Attitude of users in adopting Digital Financial Innovation on Economic Development.

H5: Attitude has a significant impact on Economic Development.

Perceived Cost of Digital Financial Innovation and Economic Development

The total cost and pricing is an element that affects people's decisions to take advantage of online financial services. Costs comprise a combination of usual costs related to using online services and the price of banking charges. Ciciretti et al. (2009) stress the significance of cost and price considerations while deciding whether to adopt online financial services. In addition, pricing is typically the main factor in choosing a different brand (Gupta, 1988). Rayport and Sviokla (1994) validated the significance of cost in relation to digital service delivery. This indicates that the desire to employ innovative technology is correlated with fair pricing, as lower costs could encourage users to take advantage of a service like this. Compared with conventional banking operations, online financial services are more affordable and quicker (Sayar and Wolfe 2007). The facilities provided by digital banking are affordable, timing and location-insensitive, and accessible. This paper investigated the impact of the Perceived cost of Digital Financial Innovation on Economic Development.

European Economic Letters
ISSN 2323-5233
Vol 15, Issue 1 (2025)
http://eelet.org.uk

H6: Perceived Cost has a significant impact on Economic Development.

Economic Development and Sustainable Development

Digital financial innovations are being recognized as a fresh opportunity for economic development. DFI refers to initiatives to offer affordable online opportunities for banking offerings, especially to populations with limited access (Zhang et al. 2019). It provides organizations with online methods of creating funds, deposits, and possibilities for investing (Ozili 2018). Banking facilities have been greatly improved by advances in technology and digitization. There are various methods by which DFI might boost economic development. According to Schneider (2018) businesses, financial institutions, and governmental organizations will operate much more efficiently and generate a huge rise in revenue if they are not dependent on cash and physical documents for day-to-day activities. A significant factor in enhancing sustainability can be economic development. The growth of banking services can make it easier to finance sustainability program developments at a reduced cost. Protecting the environment is a public sector endeavor that can increase financing availability, which is crucial for the government. This paper finds out the impact of economic development on the sustainable development of India.

H7: Economic Development has a significant impact on Sustainable Development.

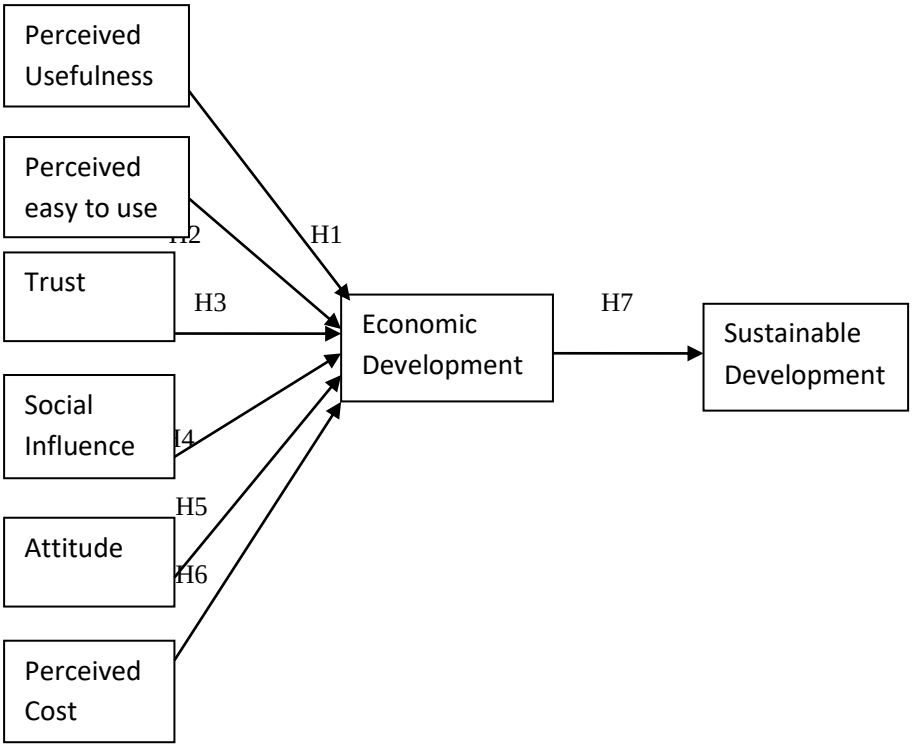

Figure 1. Conceptual framework created by the author

Research Methodology:

For the preparation of the questionnaire, previous research and specialists were consulted. The questionnaire was prepared with 65 items. There were 4 sections of the survey. The first section was related to demographic information, the second section included items related to factors affecting digital financial innovations, the third section included questions related to economic development, and the last section was related to items related to sustainable development. Every answer was rated by participants according to how much they agreed or disagreed with the opinion on the issue. The level of agreement was assessed using a five-point Likert scale which included strongly disagree, disagree, neutral, agree, and strongly agree. These were coded for analysis as strongly disagree-1, disagree-2, neutral-3, agree-4, and strongly agree as 5.

Data Collection:- For data collection, the target area was NCR because the National Capital Region is one of the most densely populated areas in India, comprising cities such as Delhi, Gurgaon, Noida, Faridabad, Sonipat, Panipat, and Karnal. As a result, it is home to a large and diverse population, making it an ideal location for collecting primary data on various topics, including social, economic, and environmental issues. Secondly, the National Capital Region is a hub for various industries and businesses, including IT, finance, manufacturing, and healthcare. As a result, it offers a unique perspective on the challenges and opportunities facing different sectors of the economy. Therefore, collecting primary data from this region can help to provide insights into the impact of Digital Financial Innovation on the economic and sustainable development of India. The data was collected over a period of six months through circulating questionnaires in online as well as offline mode. Various types of respondents are included in this research. All categories of respondents such as categorized on the basis of gender, age, profession, and income were included for data collection.

For the research sample size sufficiency was checked. Bentler (1989) recommended an effective sample size to free attributes proportion that was a minimum of 5:1. Nunnally (1967) also recommended that each object or attribute being tested have a minimum of ten samples. These recommendations led to the determination that a sample size of 400-500 was appropriate for the research.

Table 1. Demographic analysis of respondents

Variable	Category	Percent
Gender	Male	32.2%
	Female	67.8%
Age	18-25	45.1%
	25-35	24.5%
	35-45	18.8%
	45-55	9.6%
	More than 55	2.0%
Profession	Govt. Job	13.1%
	Pvt. Job	31.6%
	Self Employed	14.1%
	Unemployed	41.2%
Income	Less than 3 lac	64.1%
	3 lac-6 lac	16.5%
	6 lac-12 lac	14.5%
	More than 12 lac	4.9%
Use of Digital Banking	Using	81.4%
	Not using	18.6%
Mode of Digital Banking	Mobile Banking	64.9%
	Internet Banking	14.7%
	RTGS	0.6%
	NEFT	0.8%
	IMPS	00%
	Others	19%

Source: Author's calculations

An aggregate of 500 questionnaire responses were obtained. After obtaining these responses they were cleaned and analyzed. Incorrect responses were deleted before making the analysis. 490 responses remained after cleaning the data. Hence the sample size of this research was 490. Table 1 shows the respondent's profile.

The confirmatory Factor Analysis model was used on AMOS Graphics to check the construct reliability and validity of this model. The data were normally distributed, therefore, the maximum likelihood parameter estimate was selected (Kline, 2005). Multivariate normality presumptions and linearity were assessed. For checking the construct reliability of the model the CR (composite reliability) value should be more than 0.7. for convergent validity, the AVE (Average Variable Extracted) should be more than 0.5 and MSV (Maximum Shared Value). In Table 2 the CR value of each factor was more than 0.7. Similarly, the value of AVE was more than 0.5 and the value of AVE was also more than the value of MSV. So the validity and reliability of the CFA model were quite good.

Table 2. Showing CR, AVE, MSV and MaxR(H) values

	CR	AVE	MSV	MaxR(H)
Perceived Easy to Use	0.833	0.500	0.682	0.835
Perceived usefulness	0.728	0.471	0.682	0.730
Trust	0.839	0.513	0.494	0.855
Attitude	0.843	0.573	0.612	0.845
Perceived Cost	0.890	0.731	0.094	0.901
Economic Development	0.929	0.505	0.477	0.934
Sustainable_Development	0.903	0.509	0.487	0.907

Source- Author's calculations

For Discriminate validity, the square root of the AVE value should be more than the correlation coefficient of each variable construct. In Table 3 the square root of most of the AVE values were more than the correlation coefficient of most of the constructs. So the results showed good discriminate validity. In Table 3 bold values show the square root of the AVE value of each factor.

Table 3. Results of Discriminate validity

	Per_Eas	Per_use	Trust	Attitude	Per_Cost	Eco_Dev	Sus_Dev
Per_Eas	**0.707**						
Per_use	0.826	**0.687**					
Trust	0.703	0.636	**0.716**				
Attitude	0.775	0.782	0.671	**0.757**			
Per_Cost	-0.074	0.049	0.066	0.003	**0.855**		
Eco_Dev	0.526	0.568	0.691	0.583	0.307	**0.711**	
Sus_Dev	0.698	0.583	0.515	0.605	-0.081	0.534	**0.714**

Source- Author's calculations

For constructing the CFA model seven factors were identified. CFA was conducted by using AMOS software. In the initial stage, eight factors were identified for the research. However, after constructing the CFA model author found that one factor i.e. social influence was creating problems in the reliability and validity of the CFA model. So the author eliminated that factor. Now the model was reliable and valid also. After checking the reliability and validity of the model the model fit indices were also evaluated. For the identification of the model whether it was fit or not on collected data the goodness of fit indicators was tested. The value of chi-square($\chi 2$) should be less than 5. In the author's model chi-square ($\chi 2$) value was 3.393 which was less than 5. So the model was acceptable. The values of CFI (Comparative Fit Index) and NFI (Normed Fit Index) were 0.843 and 0.792 respectively. So the model was moderately acceptable. The value of PGFI(Parsimony Goodness of Fit Index) was 0.702. it should be more than 0.5. So the model good fit. The value of RMSEA(Root Means Square Error of Approximation) was 0.070, which is acceptable. The Chi-square($\chi 2$) value was 3.393 and the degree of freedom was 800 with a probability level of 0.000, which should be less than 0.5. So the values were in an acceptable range.

Path Analysis:-

The last part of the analysis was path analysis to identify the factors affecting digital financial innovation and its impact on economic development and then the impact of economic development on sustainable development. The path analysis was conducted to evaluate this impact on Amos. Economic and sustainable development were considered as dependent variables and the other five variables were considered as independent variables. Before conducting path analysis social influence was also included in independent variables. But it is not good for model fit. So it was eliminated from these

variables and path analysis was conducted on the remaining variables. Table 4 shows the results of path analysis. Figure 2 shows the analysis of the path diagram with regression coefficients between dependent variables and independent variables.

The R squared value indicates how well the independent variables can forecast the dependent variable was calculated as 0.665 at a 0.000 significance level which is less than 0.5. this showed that 66.5% of economic development can be forecasted by dependent variables such as perceived usefulness, perceived ease to use, attitude, trust, and perceived cost of digital financial innovation. Table 4 shows these results. Similarly, table 5 shows the results of the impact of economic development on sustainable development. In Table 5 R squared value is 0.327. it was showing that 32.7% of sustainable development can be predicted by economic development.

As per the results shown in Table 4 and Table 5, all factors have a significant impact on economic and sustainable development because the p-value of all factors is less than 0.5. According to these results, trust in digital financial innovations has the maximum impact on economic development with a regression weight of 0.616 and β (standardized regression weight) of 0.613. The perceived usefulness of digital financial innovation has also a significant impact on economic development with a regression weight of 0.257 with β value of 0.271. Similarly, attitude and perceived cost of digital financial innovation have also a significant impact on economic development with regression weights 0.160 and 0.111 with β values 0.169 and 0.246. The result also shows the negative impact of perceived ease to use of digital financial innovations on economic development which can be suppressed by other factor results. Table 5 results show the significant impact of economic development on sustainable development with a regression weight of 0.637 and β value of 0.572.

Table 4. Path analysis results of the impact of factors affecting Digital Financial Innovation on Economic Development:-

Dimensions	Regression weights	Standardized regression weights	P	R square
Eco_Dev ← Per_use	0.257	0.271	0.000	0.665($p < 0.000$)
Eco_Dev ←Per_Eas	-0.254	-0.270	0.000	
Eco_Dev← Attitude	0.160	0.169	0.005	
Eco_Dev←Trust	0.616	0.613	0.000	
Eco_Dev←Per_Cost	0.111	0.246	0.000	

Source: Author's calculation

Table 5. Path analysis results of the impact of Economic Development on Sustainable Development

Dimensions	Regression weights	Standardized regression weights	P	R square
Sus_Dev← Eco_Dev	0.637	0.572	0.000	0.327($p < 0.000$)

Source: Author's calculation

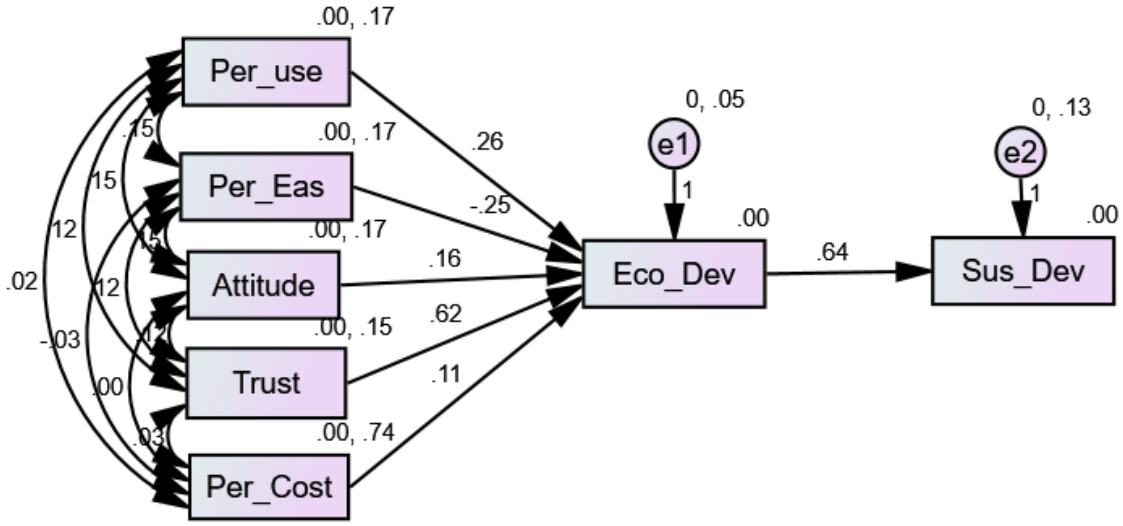

Figure 2. Path Diagram

Finding and conclusion of the study:-

The findings showed that the variables included in the questionnaire had sufficient relevance and excellent sampling appropriateness. The results of the CFA measurement model represent a good model fit. 8 statements were included for demographic information and 57 statements were included for other data in the questionnaire. The hypotheses that were set in the study were evaluated with path analysis in Amos. It is actually Structure Equation Modelling (SEM). SEM is the combination of CFA and path analysis.

As per the findings of the study, all hypotheses of the research from H1 to H7 except H4 have been accepted. It was investigated that perceived usefulness, perceived ease to use, attitude, trust, and perceived cost have significant impact on economic development. It was also found that the impact of economic development on sustainable development was also significant. In this study, it was found that perceived usefulness, attitude, and perceived cost have a positive impact on digital financial innovation, and perceived ease to use has a negative impact on digital financial innovation. Trust has the most significant impact on digital financial innovation. Similarly, economic development has a significant impact on sustainable development.

The study reveals that the population of NCR region has full trust in the use of digital financial innovations. They thought that it was not easy to use digital financial innovation. They also value the usefulness of digital financial innovation. Their attitude is also positive in using digital financial innovation. They also think that there is no more cost to using digital financial innovation. They also have the opinion that the use of digital financial innovation improves their standard of living and also contributes to the economic development of the country. With the help of digital financial innovation, they are also contributing to sustainable development.

The study examined the impact of digital financial innovation on economic and sustainable development. According to the findings of the present study, all hypotheses are accepted, which means that digital financial innovation has a positive impact on economic and sustainable development in India. The study reveals that digital financial innovation improves the living standards of people. It also contributes to the analysis of economic, environmental, and social sustainable development in India. The research also contributed to policy making by system for improving the living standard of citizens and for maintaining economic, environmental, and social sustainability in India.

Limitations of the study:-

The present study was done only in some areas of the NCR region of India. This limitation provides certain avenues to the researcher for doing study in other areas of the country and also in other countries. In this study, only six factors are considered to know the impact of these factors on the adoption of digital financial innovation. The potential researcher can take more factors for their future research. The moderation effect is not calculated in this study. This limitation also generates new scope for researchers to calculate the moderation effect of demographic factors. The researcher can do the same study with an increasing sample size.

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