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EFFECT OF CURRENCY REDESIGN ON SOCIO ECONOMIC DEVELOPMENT MEDIATED BY CASHLESS POLICY: A STUDY OF BAUCHI STATE NIGERIA

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Abstract

This study investigates the effect of currency redesign on socio-economic development in Bauchi State, Nigeria, with cashless policy serving as a mediating factor. The study employs a quantitative approach, utilizing structural equation modeling (SEM) to analyze data collected from a sample of 349 participants in Bauchi State. The study examines three key constructs: currency redesign, cashless policy, and socio-economic development. A reflective measurement model is used to assess these constructs, with reliability and validity confirmed through Cronbach's alpha, composite reliability and average variance extracted (AVE) analyses. Results indicate that currency redesign has a significant direct effect on socio-economic development, with an R^2 *value of* 0.235*. The cashless policy is found to partially mediate this relationship, demonstrating its role in enhancing the impact of currency redesign on socio-economic outcomes. The study's predictive relevance is confirmed through* Q^2 *values exceeding zero for both currency redesign and socio-economic development constructs. These findings contribute to the understanding of monetary policy effects in developing economies and highlight the importance of digital payment systems in facilitating economic growth. The study provides valuable insights for policymakers and financial institutions in Nigeria and similar developing countries, offering recommendations for effective currency management and promotion of cashless transactions to foster socio-economic development.*

Keywords: currency redesign, cashless policy, socio-economic development, Nigeria, structural equation modeling.

1. **Introduction**

Nigeria's economy has faced significant challenges in recent years, with issues such as high inflation, currency devaluation, and economic stagnation. In an effort to combat these problems, the Central Bank of Nigeria (CBN) implemented a currency redesign policy in late 2022, aimed at curbing counterfeit notes, promoting financial inclusion, and strengthening the nation's economy. This study investigates the potential effect of the currency redesign on socio-economic development in Bauchi State, Nigeria, with a particular focus on the mediating role of the cashless policy. The cashless policy, introduced by the CBN in 2012, aims to reduce the amount of physical cash in circulation and encourage the use of electronic payment systems, thereby promoting financial inclusion and economic growth.

The currency redesign, which involved the introduction of new naira notes with enhanced security features, was expected to have far-reaching implications for the Nigerian economy. While the primary objective was to curb the circulation of counterfeit currency and promote financial stability, the policy was also anticipated to have ripple effects on various aspects of socio-economic development, such as financial inclusion, consumer spending, and economic growth. Bauchi State, located in northeastern Nigeria, provides an interesting case study for examining the interplay between the currency redesign, cashless policy, and socio-economic development. As a predominantly agricultural state with a significant rural population, the effect of these policies on financial inclusion, access to credit, and economic opportunities in the region is of particular interest.

Moreover, this study aims to explore the following key aspects: the extent to which the currency redesign has facilitated the adoption of cashless payment systems in Bauchi State, and its implications for financial inclusion and access to financial services, the effect of the cashless policy on consumer spending patterns, business activities, and economic growth in the region, the potential challenges and barriers faced by individuals and businesses in adapting to the new currency and cashless payment systems, particularly in rural and underserved areas and lastly the role of government policies, infrastructure, and public awareness campaigns in supporting the successful implementation of the currency redesign and cashless policy in Bauchi State.

Therefore, by investigating these aspects, this study seeks to contribute to the broader understanding of how monetary policies and financial inclusion initiatives can drive socio-economic development in Nigeria and potentially inform future policy decisions and the findings of this study will provide valuable insights into the effectiveness of currency redesign and cashless policy in promoting socio-economic development in Bauchi State, Nigeria. The results can inform policymakers and stakeholders in making evidence-based decisions to optimize the implementation of these policies and maximize their impact on development outcomes.

2. Literature Review

2.1 Empirical Review

Research by Octaviann et al. (2017) examined the effect of motivation on employee performance. Also, Rizaldi (2017) examined the effect of motivation on employee performance shows that motivation has a positive effect on employee performance. Research by Badrianto and Ekhsan (2019) about the effect of motivation on employee performance found that motivation has a positive effect on employee performance. Hidayah (2018) shows that intrinsic motivation plays an imperative role in increasing employee job satisfaction. Octaviann et al. (2017) state that motivation has a positive and significant effect on job satisfaction. Hidayah (2018) also stated the need for employees to have the motivation to increase job satisfaction. Employees who are motivated and satisfied at work tend to contribute better to the organization (Riana, 2015; Octaviann et al., 2017).

Currency Redesign

The Central Bank of Nigeria's 2022 initiative to redesign the ₦200, ₦500, and ₦1000 notes has sparked significant interest and debate. Public perception of the redesign is mixed, with studies by Emeka-Nwokeji and Osuma (2023) and Aliyu et al. (2023) indicating that many Nigerians, including those in Bauchi State, view it positively as a step towards reducing corruption and improving the economy. However, Nwafor and Nwogu (2023) highlight challenges in rural areas due to limited information and banking access. The cost efficiency of the redesign is also debated, with Okoye et al. (2023) arguing for long-term benefits in durability and counterfeiting reduction, while Ademola and Babajide (2023) question its cost-effectiveness given Nigeria's economic challenges. In Bauchi State specifically, Sani and Mohammed (2024) suggest that despite initial costs, the redesign could lead to long-term efficiencies in currency management. Overall, the literature presents a complex picture, acknowledging potential long-term benefits while emphasizing significant short-term challenges in implementation and public acceptance, particularly in rural areas.

Cashless Policy

The implementation of Nigeria's cashless policy, which began in Lagos in 2012 and has since expanded to other regions including Bauchi State, aims to create a more efficient and transparent payment system while driving economic growth through increased access to financial services (Central Bank of Nigeria, 2019; Adeyemi & Ojo, 2019). The policy has led to the introduction of various electronic payment platforms and has shown potential for enhancing financial inclusion, particularly in underserved areas like Bauchi State (Akinpelu, 2020; Bauchi State Government, 2021). However, challenges such as inadequate infrastructure, limited internet connectivity, low digital literacy, and unreliable power supply hinder its successful implementation (Idris, 2021; Osunmakinde & Ojo, 2021). Public perception in

Bauchi State remains mixed, with some embracing the convenience of digital payments while others express concerns about security and potential cybercrime (Ibrahim & Abubakar, 2022). Despite these challenges, the cashless policy presents opportunities for improving financial inclusion and payment system efficiency, though addressing infrastructure issues, public perception, and security concerns is crucial for its success, along with continued education and community engagement.

Socio-Economic Development

Socio-economic development, a process aimed at improving the economic and social well-being of individuals and communities, presents unique challenges and opportunities in Nigeria, particularly in Bauchi State. The National Bureau of Statistics (2021) highlights that Bauchi State, located in the northeastern region of Nigeria, is characterized by high poverty rates, limited access to quality education, and inadequate health services, which significantly impact its socio-economic landscape.

Poverty remains a critical issue in Bauchi State. Bako (2022) conducted a comparative analysis revealing that the poverty rate in Bauchi State exceeds the national average, with approximately 78% of the population living below the poverty line. This high rate is attributed to factors such as unemployment, underemployment, and a heavy reliance on subsistence agriculture, which limits income generation opportunities.

The education sector in Bauchi State faces multiple challenges that hinder socio-economic development. Okon and Ibrahim (2020) report that only 59.6% of school-age children are enrolled in primary education, with even lower rates for secondary education. The authors identify inadequate infrastructure, a shortage of qualified teachers, and gender disparities in enrolment rates as key issues. In response to these challenges, the Bauchi State Government (2021) has implemented programs such as the Global Partnership for Education (GPE) to enhance educational outcomes.

Healthcare access and quality present significant concerns in Bauchi State. Abdulazeez et al. (2021) highlight that the state has one of the highest maternal mortality rates in Nigeria, linking this to inadequate healthcare services and poor health education. The authors note that while community health initiatives and partnerships with NGOs aim to provide essential health services, these efforts are often undermined by insufficient funding and infrastructural deficits.

Economic diversification is recognized as a key strategy for fostering socio-economic development in Bauchi State. Ahmed (2021) argues that promoting small and medium-sized enterprises (SMEs) in sectors such as tourism, mining, and handicrafts could create jobs and stimulate economic growth. This aligns with the state's efforts to reduce its dependence on agriculture and develop a more diverse economic base.
The Bauchi State Economic Planning Commission (2020) outlines the state's approach to addressing these socio-economic challenges in the Bauchi State Development Plan. This plan emphasizes the need for improved infrastructure, increased investment in education and healthcare, and capacity-building initiatives aimed at empowering local communities. These strategies reflect a comprehensive approach to tackling the multifaceted nature of socio-economic development in the state. The socio-economic development of Bauchi State requires a multifaceted approach that addresses poverty, education, health, and economic diversification. While challenges abound, there are also opportunities for growth through strategic partnerships, investment in human capital, and infrastructure development. Continued research and policy support will be essential in crafting effective interventions to promote sustainable socio-economic development in the region.

2.2 Theoretical Framework

The Solow-Swan Growth Theory, proposed by Solow and Swan in 1956, is a neoclassical economic model that identifies technology, labor, and capital as the main drivers of output growth. The theory posits that in the long run, technological advancement or scientific innovation will be the primary driver of growth, rather

than investment. The model assumes that the rate of technological advancement is determined externally and is independent of inflation and other external influences. The theory is based on the concept of constant returns to scale for individual factors and diminishing returns when factors are combined, expressed through the production function Y = AF (K, L), where Y is GDP, K is capital, L is labor, and A is technology.

Despite criticism regarding its applicability to closed economies, the endogenous growth model derived from this theory remains relevant to studies on economic growth, emphasizing the importance of innovation and technology as primary drivers of economic progress.

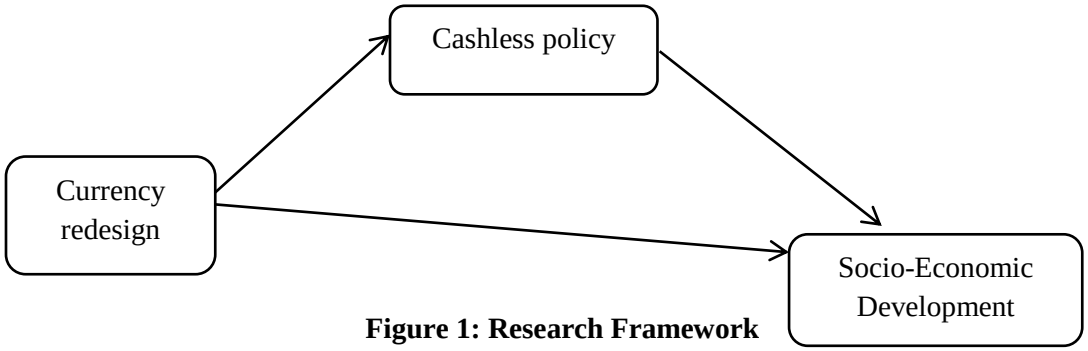

Figure 1: Research Framework

3. Methodology

The study was conducted in Bauchi State. The study was carried out by distributing the Likert scale-based questionnaires to the 349 respondents. The data collection was carried out from March 28 - JUNE 3 2024. This method is useful for testing whether there is a relationship between the latent variables (prediction). The data analysis was carried out with the help of the SmartPLS software. The data analysis was divided into two, namely: the outer model (the measurement model) and the inner model (the structural model). The testing of these two models had different purposes. The outer model was used to represent the latent variables that were being measured. Meanwhile, the inner model showed the power of estimation between the latent and construct variables

3.1 Research Design:

This study employed a quantitative approach to investigate the effect of currency redesign on socio-economic development, mediated by cashless policy, in Bauchi State, Nigeria. The quantitative method is chosen for its ability to provide numerical data that can be statistically analyzed to test hypotheses and draw generalizable conclusions. Specifically, the study will use a cross-sectional survey design. This approach allows for the collection of data from a large sample at a single point in time, providing a snapshot of the current situation regarding currency redesign, cashless policy implementation, and socio-economic development indicators in Bauchi State

3.2 Data and source:

The study was conducted in Bauchi State, Nigeria, employing a quantitative methodology. The major sources of data used in this work was mainly through primary and secondary sources of data collection, the primary data collected data involved the administration of Likert scale-based questionnaires to a sample of 349 respondents over a period spanning from March 28 to June 3, 2024. While the secondary data are collected on second hand base which was obtained through the use of textbooks, seminars, journals, newspapers and internet. For data analysis, the researchers utilized SmartPLS software, implementing a two-pronged approach: the outer model (measurement model) and the inner model (structural model). This analytical framework was selected to examine the relationships between latent variables, whereby the outer model served to represent the measured latent variables, while the inner model elucidated the estimation power

between latent and construct variables. This methodological approach is particularly successful in testing predictive relationships among latent constructs within the research paradigm.

3.3 Population and Sampling:

The target population for this study will be the residents of Bauchi State, Nigeria, including individuals, households, and businesses and a multi-stage sampling technique will be employed to ensure a representative sample is obtained. This will involve stratifying the population based on geographic location (urban and rural areas) and then using random sampling to select participants within each stratum.

3.4 Data Collection Methods:

Survey Instrument: A structured questionnaire was developed based on the research objectives and literature review. The questionnaire will include sections on demographic information, perceptions of currency redesign, adoption of cashless policies, and indicators of socio-economic development. Sampling: A multi-stage sampling technique employed to ensure a representative sample from across Bauchi State. This involved Stratifying the state into its local government areas.

3.5 method of data Analysis:

Quantitative data collected through the survey and analyzed using descriptive and inferential statistics. Descriptive statistics will be used to summarize the characteristics of the sample and the variables of interest, while inferential statistics (e.g., regression analysis, structural equation modeling) will be used to test the hypothesized relationships between currency redesign, cashless policy, and socio-economic development.

3.6 Ethical Considerations:

The study adhered to ethical guidelines for research involving human subjects. Informed consent obtained from all participants, ensuring they understand the purpose of the study and their rights as participants as well as the confidentiality and anonymity of participants was maintained throughout the research process.

3.7 Limitations and Delimitations:

The study will be limited to Bauchi State, Nigeria, and the findings may not be generalizable to other states or countries and the study was focus on the mediating role of the cashless policy and may not exhaustively examine other potential mediating or moderating factors.

4. Results and Discussion

Partial Least Square Structural Equation Modelling (PLS-SEM) was used in the examination of the research models devised for this study, via operation of the SmartPLS application module (Ringle, Wende, & Becker, 2015). The dual-stage analytical approach (Anderson & Gerbing, 1988; Hair, Hult, Ringle, & Sarstedt, 2017) that comprised (i) evaluations of current measurement models and (ii) evaluations of current structural models was applied after carrying out descriptive analyses. This two-stage analytical approach comprising a measurement model and a structural model evaluation is better than a one-step evaluation (Hair, Black, Babin, & Anderson, 2010; Schumacker & Lomax, 2004). The measurement models describe the measurements of constructs and structural models define the relationships among constructs in structural models (Hair et al., 2017). The application of the PLS method for assessing the structural and measurement models used in this study is due to the technique's capacity for performing simultaneous analyses, which results in more accurate assessments (Barclay, Higgins, & Thompson, 1995).

4.1 Assessment of measurement model

Data analysis was conducted using Smart PLS 3.2.8 (Ringle et al., 2015) for regression analysis of the research model. Hair et al. (2014, 2017) proposes a two-stage approach for PLS-SEM model examination: measurement model assessment followed by structural model assessment.

All constructs in this study employ reflective measurement. Assessing a reflective measurement model involves evaluating internal consistency, convergent validity, and discriminant validity. Indicator reliability typically requires an outer loading of 0.708

or higher, though loadings above 0.4, 0.5, 0.6, and 0.7 are acceptable if average variance extracted (AVE) and composite reliability (CR) thresholds of 0.50 and 0.70, respectively, are met (Hair et al., 2014). Items with loadings below 0.5 were removed following Hair et al.'s (2014) criteria. To conclude the convergent validity assessment, AVE was evaluated. AVE represents the grand mean of squared loadings for all items related to a construct (Hair et al., 2017). Convergent validity is achieved when each construct's AVE exceeds 0.50 (50%) (Hair et al., 2014, 2017).

Measurement Model

Table 1: Convergent Validity of Measurement Model

Construct	Items	Loading	CA	CR	AVE
Currency Redesign	CR1	0.839	0.959	0.966	0.802
	CR2	0.941			
	CR3	0.902			
	CR4	0.926			
	CR5	0.943			
	CR6	0.872			
	CR7	0.839			
Cashless Policy	CP5	0.977	0.955	0.971	0.917
	CP6	0.950			
	CP7	0.946			
Socio-Economic Development	SED1	0.900	0.940	0.955	0.810
	SED2	0.933			
	SED3	0.953			
	SED4	0.892			
	SED5	0.815			

Source: Smart PLS 4.1.0.6, 2024. Note: AVE = Average Variance Extracted, CR = Composite Reliability, α=Cronbach's alpha,

The study assessed construct validity and reliability using convergent and discriminant validity tests. Construct reliability was evaluated using Cronbach's alpha coefficients, which ranged from 0.818 to 0.959, exceeding the recommended threshold of 0.7 (Nunnally & Bernstein, 1994 Kannana & Tan, 2005). Composite reliability (CR) values ranged from 0.905 to 0.965, surpassing the 0.7 criterion (Gefen et al., 2000; Kline, 2010; Werts, 2010). Indicator reliability was assessed using factor loadings. High loadings on constructs imply that associated indicators share a common foundation (Hair et al., 2017). Most items showed factor loadings above the recommended 0.7 value (Hair et al., 2010), except for items SED6, SED7, and CPS1-4, which were removed due to low loadings. Convergent validity was evaluated using average variance extracted (AVE) values. All constructs met the suggested threshold of 0.50 (Hair et al., 2010), satisfying convergent validity criteria.

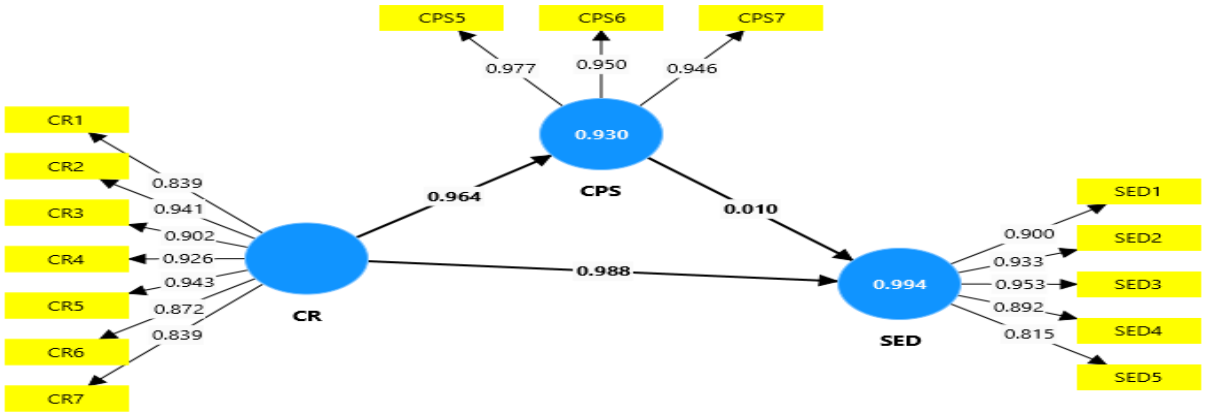

Figure 2

Table 2: HTMT

Construct	CR	CPS	SED
CR			
CPS	0.903		
SED	0.547	0.541	

Source: Fieldwork 2024 Key: CR Currency Redesign, CPS Cashless Policy, SED Socio-Economic Development.

In order to assess heterotrait-monotrait ratios (HTMT) were used as the first step in tests for indicator discriminant validity (Hair et al., 2017). The table 2 show heterotrait-monotrait ratios (HTMT) results of the study.

Table 3: VIF

Constructs	CR	CPS	SED
CR		1.307	
CPS			
SED	1.165	1.428	

Source: Fieldwork 2024

The inner model test with the Smart PLS application was carried out by analyzing the R-square value, multicollinearity test, and path coefficient. The recommended value for the multicollinearity test (VIF) is less than 5. Table 3 Shows, that all of the exogenous variables do not have a high correlation with the endogenous variables.

Coefficient of Determination Assessment (R2) and (Q2)

The coefficient of determination (R2) measures a model's predictive power by quantifying the combined effect of predictor constructs on an endogenous variable. It represents the proportion of variance in the dependent variable explained by its direct predictors (Rigdon, 2012; Sarstedt et al., 2014). While there's no universal standard for acceptable R2 values, they are influenced by model complexity and the nature of the studied phenomenon (Hair et al., 2014). Murphy and Myors (2003) suggest R2 values of .25, .10, and .01 represent large, medium, and weak effects, respectively. Hair et al. (2014) consider an R2 of .20 high in behavioral studies. In this study, currency redesign and socio-economic development are predicted by other variables. Results indicate that socio-economic development explains 46% of the variance in currency redesign. The cashless policy (mediator) directly explains 23.5% of the variance in socio-economic development (dependent variable).

After determining the coefficient of determination (R2), it's crucial to assess the model's predictive relevance using Q2. This value is obtained through the blindfolding procedure in SmartPLS, a sample reuse technique that removes part of the data and estimates the model with the remaining data (Chin, 1998; Hair et al., 2019, 2020; Henseler et al., 2009). For complex models, Chin (2010) recommends using the cross-validated redundancy technique (CVR) to measure predictive relevance. A Q2 value above zero indicates acceptable predictive relevance of the predicting constructs on the target endogenous variable, suggesting a good path model (Hair et al., 2011, 2017). In this study, both currency redesign and socio-economic development show Q2 values of 0.22, exceeding zero and indicating good predictive relevance for the model.

Table 4

Constructs	R^2	Q^2
Socio-Economic Development	0.235	0.22

Source: fieldwork 2024

Summary of F^2

The effect size (f 2) indicates the level of impact or influence of an individual predicting variable on a directly associated or linked dependent variable. It presents the degree of the influence of each exogenous variable on an endogenous construct. It also reflects the disparity in R2 value due to the direct elimination of a predicting variable in the model. Consequently, the effect size (f 2) is applied when measuring the significance of each variable in the model. It is thus concluded that the larger the effect size of a predicting variable in the model, the higher the significant association it has with the endogenous construct.

Table 5 (F^2)

Construct	HP	JS
CPS		0.727
CR		
SED	0.225	0.008

Source: fieldwork 2024

4.3 Structural Model

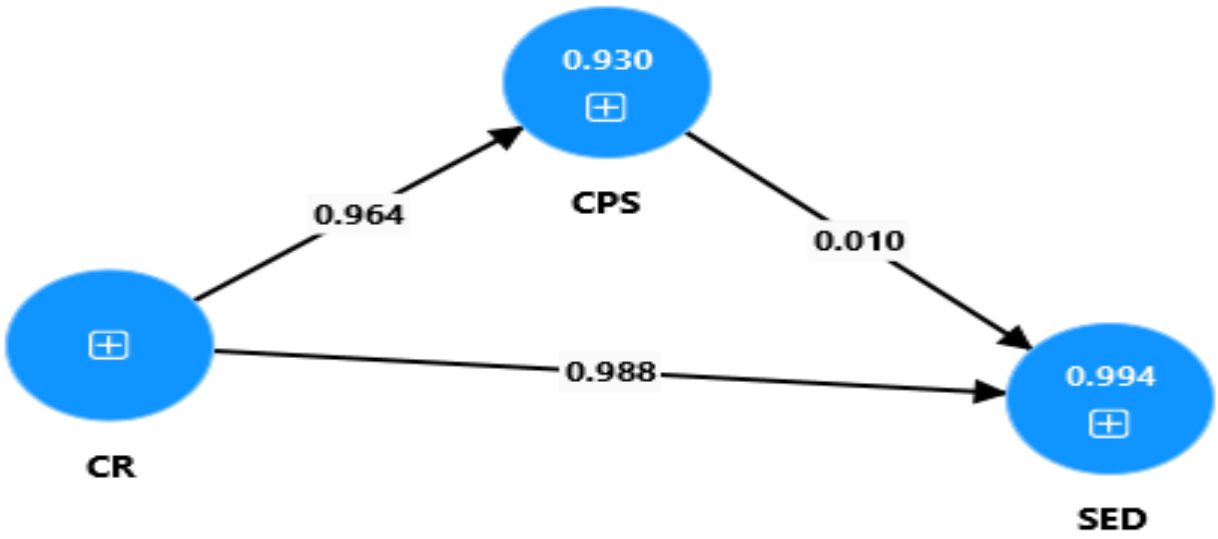

Figure 3

4.2 Result of Hypothesis

The picture above in Figure 3 illustrates the structural model for three constructs: Currency redesign: Measured by seven indicators (CR1, CR2, CR3, CR4, CR5, CR6, CR7), Cashless policy: Measured by three indicators (CPS5, CPS6, CPS7), Socio-economic development: Measured by five indicators (SED1, SED2, SED3, SED4, SED5). The arrows in the diagram point from the latent constructs to their respective indicators, signifying that reflective indicators are used in this study. These indicators are appropriate for measuring the impacts of the constructs.

The hypothesized relationships between constructs are represented by arrows connecting them. To test each research hypothesis, one must analyze the relationships depicted in this model.

5. Conclusion and Recommendations

Based on the results of the data processing analysis, it can be concluded that the currency redesign, cashless policy has positive effects on the socio-economic development. The study's measurement model demonstrates robust psychometric properties, supporting the reliability and validity of the constructs used. The high Cronbach's alpha coefficients (0.818-0.959) and composite reliability values (0.905-0.965) indicate strong internal consistency and reliability of the measures. These values exceed the commonly accepted thresholds, suggesting that the items within each construct are measuring the same underlying concept consistently.

Factor loadings for most items were above the recommended 0.7 threshold, indicating good indicator reliability. The removal of items SED6, SED7, and CPS1, 3 and 4 due to low loadings shows a commitment to maintaining high measurement standards, even at the cost of reducing the number of indicators.

The average variance extracted (AVE) values meeting the 0.50 criterion provide evidence of satisfactory convergent validity. This suggests that the items within each construct are adequately related and explain a significant portion of the variance in their respective latent variables. Overall, these findings indicate a well-constructed measurement model with good construct validity and reliability. The model appears suitable for further structural analysis, as it provides a solid foundation for examining relationships between the constructs of interest, such as currency redesign, cashless policy, and socio-economic development.

However, it's important to note that while the measurement model shows strong psychometric properties, this alone does not guarantee the validity of the structural relationships or the overall theoretical model. Further analysis of the structural model and hypothesis testing would be necessary to draw conclusions about the relationships between constructs and the broader implications of the study.

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