HO CHI MINH NATIONAL ACADEMY OF POLITICS

TRAN QUANG HUNG

PRE-CONDITIONS FOR THE ISSUANCE OF CENTRAL BANK DIGITAL CURRENCY (CBDC) BY THE STATE BANK OF VIETNAM

SUMMARY OF THE DOCTORAL DISSERTATION

MAJOR: ECONOMIC MANAGEMENT

CODE: 9340410

HANOI - 2026

The Dissertation is completed at

HO CHI MINH NATIONAL ACADEMY OF POLITICS

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The Dissertation was defended against the Doctoral Dissertation Examining Committee's judgment, held at the Ho Chi Minh National Academy of Politics, at 3:30pm on Dec 12th, 2025.

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INTRODUCTION

1. Research rationale

The Fourth Industrial Revolution is reshaping the global financial system. Central Bank Digital Currency (CBDC) is regarded as a groundbreaking solution, reducing operational costs and enhancing payment efficiency. Currently, 134 central banks worldwide are engaged in CBDC research, with models such as China's e-CNY and the Bahamas' Sand Dollar. This global trend exerts significant pressure on Vietnam to modernize its financial system.

Vietnam's traditional payment system faces numerous limitations. High operational costs and processing speeds fail to meet the growing demand for digital transactions. The State Bank of Vietnam (SBV) has initiated CBDC research, yet it lacks a comprehensive theoretical framework to guide implementation. Developing a scientific foundation and practical solutions is essential to align with the national digital transformation strategy.

CBDC research holds significance beyond technical aspects, contributing to financial inclusion. In Vietnam, where access to banking services remains uneven across regions, CBDC has the potential to create a secure, efficient, and accessible payment system. Thus, this research topic is highly urgent, supporting the SBV in formulating a CBDC issuance strategy tailored to Vietnam's economic and social context.

2. Literature review

CBDC research has flourished since 2014, focusing on technological design and economic impacts. Major studies identify five key precondition groups for CBDC, ranging from policy objectives to user acceptance. Experiences from China, the EU, and the Bahamas highlight the importance of legal frameworks and public awareness. These studies provide a robust theoretical foundation but have not been adequately adapted to Vietnam's context.

In Vietnam, research on digital currency remains nascent. No study has systematically developed a theoretical framework or assessed the practical conditions for CBDC implementation. This gap is particularly evident in analyzing user intentions and practical preconditions. The dissertation aims to address this by proposing a new analytical framework and providing empirical data from surveys conducted in Vietnam.

3. Research objectives and missions

- Objective: To identify and evaluate the preconditions facilitating the issuance of CBDC by the SBV, thereby proposing recommendations for implementation suited to Vietnam's current conditions.

- Research Missions: (1) Present the theoretical foundation of CBDC and the preconditions for its issuance; (2) Examine practical experiences in establishing preconditions for CBDC in leading countries and draw lessons for Vietnam; (3) Survey stakeholders' assessments of the preconditions for CBDC issuance in Vietnam; (4) Analyze and evaluate the current state of preconditions for CBDC issuance in Vietnam, using secondary data and survey results; (5) Test the factors influencing individual users' behavioral intentions to use CBDC in Vietnam; (6)

Propose solutions and recommendations to enhance the preconditions for CBDC issuance in Vietnam.

4. Research questions

(1) What are the (groups of) preconditions promoting CBDC issuance, and how are their relationships manifested in theory and international practice?

(2) To what extent are the preconditions for CBDC issuance in Vietnam currently fulfilled, particularly regarding policy objectives, legal frameworks, stakeholder support, technological capability, and end-user acceptance?

(3) How do stakeholders (policymakers, financial institutions, payment intermediaries, businesses, and individual users) evaluate the readiness of preconditions for CBDC issuance in Vietnam?

(4) How do theoretical precondition factors impact the behavioral intention to use CBDC in Vietnam, and which factors require particular attention in designing future solutions?

(5) What solutions and recommendations are needed to enhance the preconditions for CBDC issuance in Vietnam, especially for those with significant limitations?

5. Research scope and subjects

- Research scope:

+ Spatial Scope: The study is conducted in Vietnam

+ Temporal Scope: (i) Secondary data analysis focuses on the period from January 2021 to December 2024; (ii) Survey data were collected in 2023 (Survey 1) and 2024 (Survey 2); (iii) Proposed directions and solutions target the period from 2025 to 2030.

- Research subjects: The SBV, financial institutions, payment intermediaries, and end-users (individuals and businesses).

6. Research methodology

The study combines qualitative and quantitative methods:

- Qualitative: Literature review and expert interviews.

- Quantitative: Two surveys were conducted, involving 220 respondents evaluating preconditions and 2,025 individual users assessing usage intentions. The study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to test influencing factors. Results are processed using specialized software to ensure accuracy and reliability.

7. Novel contributions of the dissertation

- Theoretical Contributions: The dissertation constructs a two-stage theoretical framework for the preconditions of CBDC issuance, comprising the establishment stage (policy objectives, legal framework, stakeholder support, and technological capability) and the market feasibility stage (end-user acceptance). This framework clarifies the relationships among preconditions and provides a foundation for future research.

- Practical Contributions: The dissertation assesses the current state of preconditions in Vietnam, identifies limitations and causes, and proposes specific solutions to enhance these preconditions, aiding the SBV in CBDC implementation. The findings serve as a valuable reference for policymakers, financial institutions, and researchers.

Chapter 1
LITERATURE REVIEW

1.1. GLOBAL TRENDS IN CBDC DEVELOPMENT

Global interest in CBDC is increasing, with 134 central banks engaged in research and development as of June 2024. Implementation varies by country, but the trend is irreversible.

- Emerging Economies (notably China and Southeast Asia): Key drivers include improving domestic payment efficiency, integrating global trade and finance, controlling financial systems, and mitigating money laundering risks. Example: China's e-CNY project, with cross-border payment trials.

- Developed Economies: CBDC is driven by needs for user data security, transaction innovation, and payment integration. Example: The U.S. FedNow project aims to reshape the economy, stabilize finance, enhance cybersecurity, and promote financial inclusion.

- Vietnam: Although research is limited, scholars view CBDC as an inevitable trend. Given its potential to enhance national competitiveness, the SBV must promptly develop a suitable roadmap.

1.2. STUDIES ON PRECONDITIONS FOR CBDC ISSUANCE

Research on preconditions for CBDC issuance has been conducted by international organizations and scholars using various methods: (i) literature analysis (Brookings, 2020; Cheng et al., 2021; Lay, 2023); (ii) empirical analysis (Cullen, 2022; Mack, 2022); and (iii) mixed methods (Morales-Resendiz et al., 2021; Zamora-Pérez et al., 2022). However, research in Vietnam remains limited.

Table 1.1: Classification of Preconditions for CBDC Issuance per Prior Studies

No.	Precondition	Detailed Content
1	Policy Objectives	- Effective monetary policy and stable macroeconomic structure (Brookings, 2020) - Clear policy objectives (Cheng et al., 2021) - Addressing domestic issues (Morales-Resendiz et al., 2021) - Financial inclusion (Cullen, 2022) - Effective impact on monetary policy (Mack, 2022)
2	Legal Framework	- Institutional effectiveness (Cheng et al., 2021) - Legal policies and regulations (Cullen, 2022) - Legal transparency (Mack, 2022) - Robust legal-institutional framework (Zamora-Pérez et al., 2022) - Legal infrastructure (Lay, 2023)
3	Stakeholder Support	- Support from stakeholders (Cheng et al., 2021) - Strategic role of central banks (Morales-Resendiz et al., 2021) - Management delegation to agencies (Mack, 2022) - Institutional coordination and oversight (Zamora-Pérez et al., 2022) - International cooperation capacity (Themistocleous et al., 2023)

No.	Precondition	Detailed Content
4	Technological Capability	- Ledger infrastructure (Brookings, 2020) - Technological infrastructure (Cheng et al., 2021) - Technological platforms and operational capacity (Morales-Resendiz et al., 2021) - Compatibility and flexibility (Zamora-Pérez et al., 2022) - Digital technological infrastructure (Sun & Rizaldy, 2023)
5	End-User Acceptance	- Development of electronic wallets (Brookings, 2020) - Market feasibility (Cheng et al., 2021) - Meeting user and market demands (Zamora-Pérez et al., 2022) - User acceptance (Lay, 2023) - Supporting business model development (Sun & Rizaldy, 2023)

Derived from the previous studies, the dissertation pinpoints five main groups of pre-conditions promoting the issuance of CBDC: (1) Policy Objectives; (2) Legal Framework; (3) Stakeholder Support; (4) Technological Capability; (5) End-User Acceptance.

1.3. GENERAL ASSESSMENT OF PRIOR STUDIES AND RESEARCH GAPS

1.3.1. General Assessment

- ***Strengths:*** Prior studies provide a robust theoretical foundation, analyze international experiences (especially in developed economies), and offer new perspectives on international cooperation in CBDC development.

- ***Limitations:*** (i) Predominantly focus on developed economies, with limited research on developing countries; (ii) Lack quantitative criteria to measure readiness levels; (iii) Primarily static analyses, overlooking dynamic interactions among preconditions over time.

1.3.2. Research Gaps

- ***Research Gaps:*** (i) Lack of in-depth studies on CBDC preconditions in Vietnam's unique context; (ii) Absence of a comprehensive quantitative criteria system to assess readiness; (iii) Limited analysis of dynamic interactions among preconditions over time.

- ***Dissertation Focus:*** (i) Comprehensive study of preconditions for CBDC issuance in Vietnam's context; (ii) Development and application of a quantitative criteria system to assess readiness; (iii) Proposal of a roadmap and solutions tailored to Vietnam's specific conditions.

Chapter 2
THEORETICAL AND PRACTICAL FOUNDATIONS OF PRECONDITIONS FOR CENTRAL BANK DIGITAL CURRENCY ISSUANCE

2.1. THEORETICAL BACKGROUND OF CENTRAL BANK DIGITAL CURRENCY

2.1.1. Definition and characteristics of CBDC

CBDC is a digitized form of currency issued and controlled by a central bank, used for retail (individuals and organizations) or wholesale (interbank) payments. It

addresses digital-era demands: convenience, security, control over electronic money circulation, and reduced costs/time for cross-border transactions. Essentially, CBDC is akin to physical currency with unique serial numbers, fulfilling all monetary functions (unit of account, medium of exchange, means of payment, and store of value). The dissertation focuses on CBDC's payment function.

Table 2.1: Comparison of Characteristics of Various Currency Forms

	Existing Central Bank Currency		**CBDC**		
	Cash	Reserves and Settlement Balances	Retail		Wholesale
			Token	Account	Token
Available 24/7	√	X	√	(√)	(√)
Anonymity with Central Bank	√	X	(√)	X	(√)
Par Convertibility	√	X	(√)	X	(√)
Interest-Bearing	X	(√)	(√)	(√)	(√)
Limited	X	X	(√)	(√)	(√)

√ = Existing Feature; (√) = Potential Feature
X = Not a Typical or Feasible Feature.

Source: Auer and Böhme (2020)

The prominent features of CBDC provide advantages in security (tracing illicit transactions via blockchain) and efficiency (long-term financial stability, timely implementation of monetary policy, promotion of technology, and financial inclusion).

2.1.2. Benefits and Management Challenges of CBDC

- ***Benefits:*** (i) Enhances payment system efficiency and safety (optimizing speed, increasing security, reducing transaction costs, integrating cross-border payments, and promoting the digital economy and e-commerce); (ii) Strengthens monetary policy effectiveness (enabling sophisticated policy tools, reducing policy lags, and improving macroeconomic responsiveness); (iii) Modernizes tax and financial service management (supporting efficient tax administration, enhancing financial transparency, and creating an open infrastructure for financial service innovation); (iv) Promotes financial inclusion (extending financial services to underserved groups, rural areas, and remote regions); (v) Democratizes access to safe central bank money (offering a secure digital payment alternative to private solutions); (vi) Optimizes national resources and supports sustainable development (reducing cash-related costs and supporting green banking and Net Zero commitments).

- ***Management Challenges:*** (i) Restructuring financial markets (shifting deposits from commercial banks to CBDC); (ii) Addressing cybersecurity risks; (iii) Mitigating potential misuse of CBDC for illicit activities; (iv) Managing risks of system disruptions.

2.1.3. CBDC Development Models

Based on the issuance scope, CBDC has two main models:

- Wholesale CBDC: Targets financial institutions, replacing reserve accounts or settlement accounts for interbank payments or digital asset settlements.

- Retail CBDC: Targets individuals and small organizations, partially or fully replacing cash for end-users. Retail CBDC includes three sub-models: direct, hybrid, and intermediated.

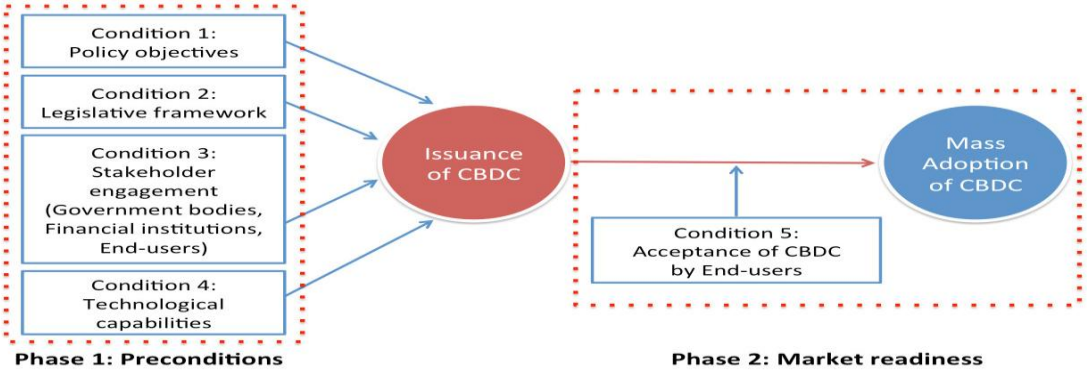
2.2. THEORY OF PRECONDITIONS FOR CBDC ISSUANCE

2.2.1. Definition of Preconditions for CBDC Issuance

Preconditions for CBDC issuance are essential theoretical and practical factors that a country must fulfill to successfully implement CBDC. These preconditions vary over time and by national/regional context, requiring careful assessment. Identifying and clarifying these preconditions is critical due to CBDC's complexity and profound impact compared to previous financial innovations.

The study approaches preconditions from technical, policy/institutional, and integrated perspectives. Based on insights from major central banks and prior research, the dissertation establishes five key preconditions across two stages: ***(i) Stage 1 (Establishment):*** Policy objectives, legal framework, stakeholder support, and technological capability; ***(ii) Stage 2 (Market Feasibility):*** End-user acceptance. These preconditions are interlinked and evolve over time.

Figure 2.1: Analytical Framework for Preconditions Promoting CBDC Issuance



The two-stage theory effectively addresses research gaps, providing a logical framework, clearly delineating the objectives of each condition group, and prioritizing the establishment of a national foundation before considering international cooperation. This theoretical model reflects three core elements of monetary innovation: (i) legitimacy (policy objectives and legal framework), (ii) efficiency (technological capability and stakeholder support), and (iii) societal acceptance (end-user acceptance).

2.2.2. Preconditions for CBDC Issuance

(1) Policy Objectives:

- Identification Basis: A prerequisite that guides research, development, design, and technology choices. Essential because CBDC designs vary by objective (e.g., supporting monetary policy vs. replacing cash). International experiences (e.g., Bahamas, China) show clear objectives to optimize resources and enable post-implementation evaluation (BIS, 2023). Clear objectives drive project success (e.g., e-CNY), while ambiguity leads to failure.

- Nature and Content: (i) Strengthen payment system resilience (providing a

backup channel and maintaining operations during traditional system failures); (ii) Diversify payment methods (offering multiple options and creating new use cases); (iii) Promote financial inclusion (expanding access to low-cost financial services for underserved groups through simplified KYC, offline capabilities, and welfare integration); (iv) Enhance cross-border payment efficiency (reducing intermediaries, shortening transaction times, improving traceability, and managing liquidity risks); (v) Support sustainable development (reducing environmental impacts of cash production, enabling green finance, promoting sustainable consumption, and enhancing budget transparency).

- Mechanisms for Promotion: (i) Provide a framework for design and development (optimizing resources and selecting suitable models); (ii) Foster stakeholder consensus and collaboration (clarifying roles, reducing conflicts, and attracting technology partners); (iii) Establish a basis for evaluation and flexible adjustments (defining specific metrics, addressing issues early, and learning from international experiences). These mechanisms operate synergistically, creating a positive feedback loop, particularly crucial in developing countries.

(2) Legal Framework:

- Identification Basis: A critical condition providing legal legitimacy and public trust. Essential because central banks require clear legal authority (Bossu, 2020). International experiences show legal frameworks must precede implementation, and robust frameworks enhance public confidence (IMF, 2023).

- Nature and Content: (i) Management authority (clarifying the central bank's role in direct or indirect models, with a strategic focus recommended; Morales-Resendiz, 2021); (ii) Legal status of currency (recognizing CBDC as legal tender to ensure reliability and accessibility; Cheng, 2021, while avoiding inequality); (iii) Privacy and security (balancing user privacy with state oversight, with strict data protection regulations); (iv) Risk prevention (establishing AML/CFT regulations, monitoring suspicious transactions, fostering international cooperation, and ensuring system integrity).

- Mechanisms for Promotion: (i) Ensure clarity of rights and obligations (enabling stakeholders, especially financial intermediaries, to understand roles and invest resources); (ii) Build public and market confidence (ensuring transparency, fairness, and safety through privacy protections and comprehensive user safeguards); (iii) Provide a foundation for resolving issues (offering tools and processes for handling disputes, incidents, and violations, with flexible risk management). These mechanisms operate in tandem, balancing stability and adaptability.

(3) Stakeholder Support:

- Identification Basis: A fundamental condition critical for designing and developing the CBDC ecosystem and shaping public perception. Essential because CBDC success depends on stakeholder coordination (BIS, 2023). Experiences from China and Singapore highlight the decisive role of initial support, with public-private partnerships driving innovation and adoption (e.g., Sand Dollar).

- Nature and Content: (i) Government agencies (providing direction and frameworks: central banks for issuance and management, legislatures for legal frameworks, and supervisory bodies for compliance); (ii) Financial intermediaries

(bridging central banks and users: commercial banks for distribution and services, fintech for technology and innovation, and other intermediaries for network expansion); (iii) End-users (determining success through adoption: individuals for daily payments, businesses for transaction acceptance, and civil society for network effects). These groups are closely interlinked.

- Mechanisms for Promotion: (i) Generate momentum and resources for development (strong commitment drives financial, human, and technological investments; e.g., e-CNY, Project Ubin); (ii) Build a comprehensive, sustainable ecosystem (each stakeholder contributes strengths: central banks for monetary stability, financial institutions for infrastructure, and users for market demand; e.g., Sand Dollar); (iii) Reduce barriers and conflicts (addressing issues through dialogue, efficient information channels, and market-oriented decisions; e.g., Project Ubin, DCash). These mechanisms create a virtuous cycle, particularly vital in developing countries.

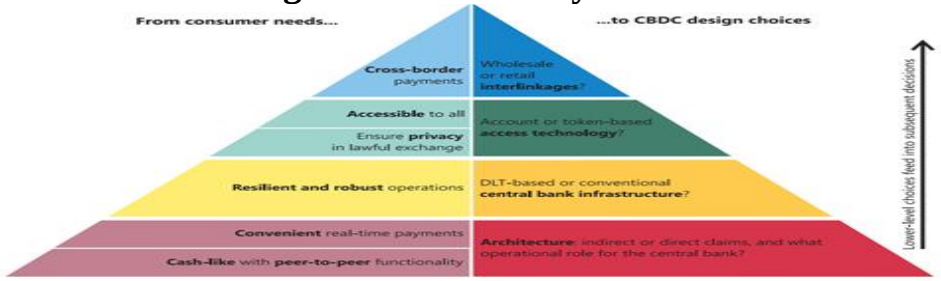
(4) Technological Capability:

- Identification Basis: The foundation determining CBDC's form and operations. Essential for successful implementation, requiring robust technological infrastructure (Auer & Böhme, 2020). Experiences from Singapore and China demonstrate that digital infrastructure is a prerequisite, directly impacting innovation, security, and scalability (IMF, 2023).

- Nature and Content: (i) Digital infrastructure (basic platforms: telecommunications, electricity, data centers, and cloud computing); (ii) Innovation capability (ability to develop and apply new technologies, measured by Global Innovation Index, R&D investment, and startup ecosystems); (iii) End-user accessibility (access to devices, digital/financial literacy, and habits of using digital services); (iv) Technology choices by issuers (architecture: single-tier or two-tier; platform: centralized or blockchain; access form: account-based or token-based; scope: retail/wholesale, domestic/cross-border).

- Mechanisms for Promotion: (i) Provide a technical foundation for development and operation (handling large transaction volumes, ensuring continuity, and enabling advanced features like smart payments; e.g., e-CNY, Project Ubin); (ii) Ensure security, efficiency, and scalability (using encryption, authentication, and blockchain for security, balancing privacy and compliance; e.g., Sand Dollar, Project Dunbar); (iii) Facilitate integration with existing systems and future adaptability (standardized protocols, APIs, and innovation promotion; e.g., Project Ubin, digital Euro). These mechanisms form a self-reinforcing cycle, requiring long-term investment.

Figure 2.2: CBDC Pyramid



Source: Auer and Böhme (2020)

(5) End-User Acceptance:

- Identification Basis: A decisive condition (Stage 2) reflecting market feasibility. Essential because the Unified Theory of Acceptance and Use of Technology (UTAUT) indicates acceptance depends on performance expectancy, effort expectancy, and social influence. International experiences show that low acceptance is a major barrier (e.g., e-CNY) or success factor (e.g., Sand Dollar), with user trust and awareness being critical (Bijlsma, 2021).

- Nature and Content: (i) Effort expectancy (ease of access and use: user interface, access costs, and integration with existing systems); (ii) Performance expectancy (perceived benefits: utility, speed, cost, 24/7 availability, safety, and offline capabilities); (iii) Social influence (impact of social norms, market trends, and policy incentives); (iv) Facilitating conditions (supporting factors: knowledge, skills, infrastructure, and technical support); (iv) System trust (foundational elements: security, privacy, transparency, and institutional credibility). These aspects interact to determine long-term acceptance.

- Mechanisms for Promotion: (i) Generate genuine market demand (user acceptance encourages provider participation and innovative solutions; e.g., Sand Dollar, e-CNY); (ii) Shape positive network effects (value increases with user numbers, attracting new users and providers; e.g., e-CNY); (iii) Enable continuous system improvement (user feedback informs design and feature adjustments; e.g., eNaira, Jam-DEX). These mechanisms operate synergistically, requiring a comprehensive promotion strategy.

2.3. INTERNATIONAL EXPERIENCES IN ESTABLISHING AND IMPLEMENTING PRECONDITIONS FOR CBDC ISSUANCE

Lessons for Vietnam from International Experiences:

- For Policy Objectives: Define clear priorities (financial inclusion as a top goal), enhance payment efficiency, and strengthen system resilience. Regularly review and adjust objectives.

- For Legal Framework: Develop incrementally (amend laws, issue detailed regulations, protect privacy, and manage risks). Adopt models like China's "controlled anonymity" or Singapore's decentralized risk management.

- For Stakeholder Support: Foster public-private partnerships (e.g., China's two-tier model).

- For Technological Capability: Invest in synchronized infrastructure and innovation. Consider hybrid architectures and combined technologies (DLT and centralized). Prioritize interoperability, system integration, and offline transactions.

- For User Acceptance: Ensure CBDC offers superior features, integrates with existing banking systems, and prioritizes communication and education to build trust (security and privacy). Avoid coercive measures.

Table 2.6: List of Central Banks Selected for Study

No.	CBDC Stage	No. of Countries	Countries studied
1	Research	44	US, Netherlands, Chile, Jamaica
2	Proof of Concept (POC)	30	Brazil, Japan, Thailand

No.	CBDC Stage	No. of Countries	Countries studied
3	Pilot	36	France, Sweden, Canada, China, India, Singapore, Nigeria
4	Launch	3	Bahamas
	Total	**113**	**15**

In summary, CBDC development requires a holistic strategy, balancing all aspects and flexibly adapting international experiences to Vietnam's context.

Chapter 3
RESEARCH METHODOLOGY

3.1. APPROACH AND METHODS

3.1.1. Approach

- Systems Approach: Examines CBDC and its preconditions as an integrated system with multidimensional interactions. Theoretically, it applies the two-stage analytical framework (establishment and market feasibility) to clarify each precondition's role and logic. Practically, it analyzes interactions among stakeholders (SBV, financial institutions, payment intermediaries, businesses, and individuals) to propose synchronized solutions.

- Economic Management Approach: Ensures practicality and feasibility of recommendations. Situates the issue within the broader economic context, aligning with macroeconomic goals (monetary stability, digital payments, and financial inclusion). Solutions aim to enhance state management efficiency, the SBV's coordination role, and thorough analysis of resources and implementation roadmaps. Quantitative methods provide empirical evidence for policy planning.

3.1.2. Research Methods

(i) Qualitative Research:

- Literature Analysis and Synthesis: Reviews related studies, systematizes theoretical foundations, and analyzes international experiences.

- Expert Interviews: Gathers insights from four groups (SBV officials, researchers, commercial bank staff, and fintech experts) on international experiences, Vietnam's current state, prospects, and solution directions.

- Qualitative Survey (***Survey 1***): Conducted with 220 respondents (policymakers/experts, businesses, financial institutions/payment intermediaries, and individual users) to assess the readiness of the five precondition groups, informing the analysis of the current state.

(ii) Quantitative Research:

- Conducted ***Survey 2*** on a large scale (2,025 individuals/households) nationwide.

- Analyzed relationships between precondition factors and individual users' intentions to use CBDC.

- Process: Scale validation (Exploratory Factor Analysis, Confirmatory Factor Analysis) → PLS-SEM model estimation.

3.2. MODEL FOR COMPREHENSIVE ASSESSMENT OF PRECONDITIONS FOR CBDC ISSUANCE IN VIETNAM USING

QUANTITATIVE CRITERIA

3.2.1. Objectives

The first research model comprehensively evaluates the preconditions for CBDC issuance in Vietnam through quantitative criteria, encompassing three levels of analysis: (i) overall assessment via a criteria system; (ii) in-depth analysis of each precondition (using secondary data and surveys); and (iii) testing relationships between preconditions and CBDC issuance feasibility. Results from these levels complement each other to propose feasible solutions.

3.2.2. Criteria for Measuring Preconditions for CBDC Issuance

The criteria system is developed based on prior research and Vietnam's practical conditions. Each precondition group includes five specific criteria, evaluated on a 0–10 scale (0: not ready, 10: fully ready). The score for each group is the weighted average of its five criteria; the overall score is the weighted sum of the five groups.

Criteria are based on: Policy objectives (Brookings, 2020; Cheng, 2021); Legal framework (Cullen, 2022; Mack, 2022); Stakeholder support (Morales-Resendiz, 2021); Technological capability (Sun & Rizaldy, 2023); User acceptance (user behavior studies).

Scoring: (i) Policy objectives and legal framework: primarily evaluated by policymakers/experts; (ii) Technological capability: primarily by financial institutions/payment intermediaries/businesses; (iii) User acceptance: directly surveyed from users. Results are aggregated using a weighted average method based on each group's relevance and expertise. Final scores are analyzed at three levels (criteria, precondition groups, and overall).

Table 3.1: System of Criteria for Measuring Preconditions for CBDC Issuance (evaluated by Readiness Level)

Precondition Group	Measurement Indicator	Description	Score
1. Policy Objectives	1.1. Clarity of Issuance Objectives	Promote economic stability, diversify payment methods, support financial inclusion, and enhance monetary policy	10
	1.2. Support for Financial Inclusion Policies	Enhance access to financial services for unbanked populations	10
	1.3. Compatibility with Existing Payment Systems	Interoperability and integration with current payment systems	10
	1.4. Support for Monetary Policy	Significant role in managing money supply, interest rates, and inflation stabilization	10
	1.5. Contribution to Transaction Cost Reduction	Potential to reduce transaction costs in the financial system	10
2. Legal Framework	2.1. Authority to Issue and Manage CBDC	Clear legal provisions allowing the central bank to issue and manage	10

Precondition Group	Measurement Indicator	Description	Score
		CBDC	
	2.2. Privacy Protection and Anti-Money Laundering	Legal framework protecting user privacy and complying with AML regulations	10
	2.3. Dispute Resolution and Legal Risk Management Mechanisms	Legal mechanisms to address disputes and mitigate legal risks in CBDC transactions	10
	2.4. Legal Status of CBDC as Legal Tender	Recognition of CBDC as a legal payment method	10
	2.5. Privacy and Personal Data Security Regulations	Ensure user privacy and data security protections	10
3. Stakeholder Support	3.1. Approval from Government and Central Bank	Commitment and roadmap support from government agencies and the central bank	10
	3.2. Private Sector and Financial Institution Collaboration	Cooperation and readiness from financial institutions, technology companies, and businesses	10
	3.3. International Organization Participation	Support and collaboration with international organizations (e.g., IMF, World Bank, major central banks)	10
	3.4. Academic and Expert Community Support	Feedback from experts and academic research on CBDC feasibility	10
	3.5. Feedback from NGOs and Civil Society	Input from NGOs, civil society, and interest groups on CBDC impacts	10
4. Technological Capability	4.1. Digital Infrastructure and Interoperability	Mobile networks, internet, and technical elements necessary for CBDC systems	10
	4.2. Security and Fraud Prevention Capabilities	Robust security solutions to protect CBDC systems from cyberattacks	10
	4.3. System Processing and Scalability	Ability to handle large transaction volumes and scale as needed	10
	4.4. Offline Functionality	CBDC operability without internet connectivity, ensuring continuity and broad accessibility	10
	4.5. Data Monitoring and Analysis System Readiness	Capability to monitor and analyze transaction data effectively	10

Precondition Group	Measurement Indicator	Description	Score
5. End-user Acceptance	5.1. Public Awareness and Understanding of CBDC	Public knowledge of CBDC and its benefits	10
	5.2. Acceptance and Readiness to Use CBDC	Public willingness to use CBDC as an alternative to cash or other payment methods	10
	5.3. Digital Technology Access	Prevalence of digital devices and ability to use them	10
	5.4. Trust in Security and Privacy	User confidence in CBDC system security and privacy	10
	5.5. Motivation to Use New Digital Payment Methods	Public readiness to adopt and experiment with new payment technologies	10

3.2.3. Sampling and Data

Survey 1 involved 220 respondents: (i) Policymakers and economic experts (35); (ii) Businesses (54); (iii) Financial institutions and payment intermediaries (26); (iv) Individual users (105). Sample selection criteria focused on experience, sector of activity, and level of digital payment usage.

Evaluation weights for each respondent group were determined based on their expertise and role in CBDC development: (i) Policy objectives and legal framework: highest weight for policymakers/experts; (ii) Technological capability: highest for financial institutions/payment intermediaries; (iii) User acceptance: highest for individual users; (iv) Stakeholder support: relatively balanced (policymakers/experts highest).

The survey was conducted in November 2024, yielding 220 valid responses.

Table 3.2: Respondent Groups and Evaluation Weights

No.	Respondent Group	Precondition for CBDC Issuance				
		Condt. 1	**Condt. 2**	**Condt. 3**	**Condt. 4**	**Condt. 5**
1	Policymakers and Economic Experts (35)	0.45	0.50	0.30	0.20	0.15
2	Businesses (54)	0.25	0.15	0.25	0.25	0.25
3	Financial Institutions and Payment Intermediaries (26)	0.20	0.25	0.25	0.40	0.20
4	Individual Users (105)	0.10	0.10	0.20	0.15	0.40
	Topal: 220	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

3.3. EMPIRICAL MODEL OF ANTECEDENTS OF BEHAVIORAL INTENTION TO USE CBDC IN VIETNAM

The second research model identifies and analyzes key factors impacting Vietnamese users' intentions to use CBDC. The model is built on the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh, 2003), Innovation

Diffusion Theory (IDT; Rogers, 2003), and Institutional Trust Theory (ITT; Luhmann, 1979, 1988), incorporating currency-specific factors (trust, perceived benefits/risks), self-efficacy, and two new moderating variables (resistance to change and global brand presence).

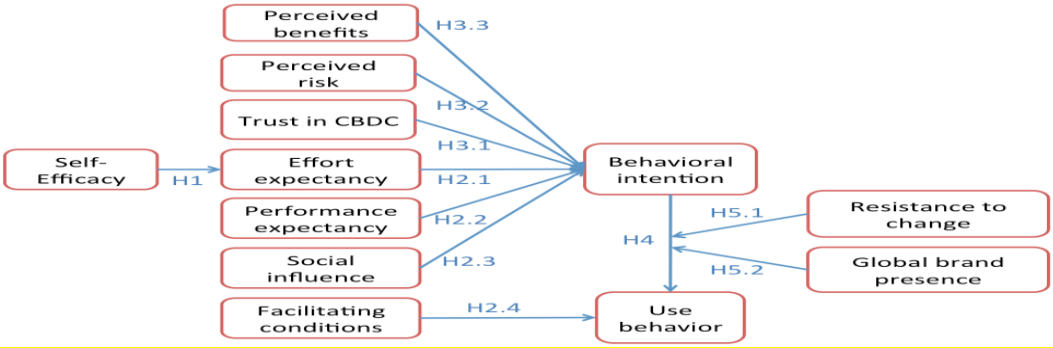
Sample Selection and Data Collection:

- Phase 1 (Qualitative, May 2023): In-depth focus groups (6 participants each) in Hanoi to clarify factor relationships and refine the questionnaire, combined with consultations with the SBV's Payment Department.

- Phase 2 (Quantitative, July–October 2023): Nationwide survey of users aged 18–65 with bank accounts and mobile devices. Distributed 4,500 questionnaires (online and in-person) across Vietnam's three regions. After screening, 2,025 valid responses were collected.

- Measurement Scale: Developed and adjusted from prior research, measured using a 5-point Likert scale.

Figure 3.1: Proposed Research Model



Source: Author's preposition.

Chapter 4
CURRENT STATE OF PRECONDITIONS FOR CENTRAL BANK DIGITAL CURRENCY ISSUANCE BY THE STATE BANK OF VIETNAM

4.1. OVERVIEW OF CURRENCY DEVELOPMENT IN VIETNAM

4.1.1. Development of Vietnamese Currency

- Feudal Period: Began with the Thái Bình Hưng Bảo coin (Đinh Dynasty), affirming monetary sovereignty. Subsequent dynasties minted their own coins (copper, zinc, iron). Paper currency appeared under the Hồ Dynasty. The late Nguyễn Dynasty introduced gold and silver ingots.

- French Colonial Period: Dominated by the Piastre (Indochinese silver coin), exclusively issued by the Bank of Indochina.

- Post-August Revolution (1945): The Democratic Republic of Vietnam issued "Cụ Hồ banknotes." In 1951, the National Bank of Vietnam was established, transitioning to a credit-based monetary system.

- From 1975: Nationwide currency unification through reforms. In 2003, a shift from cotton to polymer banknotes occurred. Vietnamese currency has served as a payment medium and a reflection of cultural identity and national sovereignty.

4.1.2. Modern Currency Management Framework in Vietnam

- Issuance Authority: The SBV is the sole issuer of Vietnamese currency (paper

and coins), recognized as legal tender. The SBV ensures sufficient supply and manages issuance and destruction processes.

- Issuance Principles: Conducted through credit channels (rediscounting, government lending), based on the demand for goods/services circulation, ensuring centralized control.

- Circulation Regulation Structure: Operates specialized funds (banking operations, cash regulation, issuance reserves) for flexible regulation.

- This framework supports national currency management but requires modernization to accommodate digitalization and provide a legal basis for CBDC.

4.1.3. Development of Modern Payment Systems

Vietnam's payment system has advanced significantly, driven by digitalization, supportive policies, and public readiness.

Figure 4.1: Vietnam's Digital Technology Transformation Landscape, 2020–2023

 Smartphone Penetration: **150 → 164% (whole population)**	 Internet Penetration: **70 → 79% (whole population)**	 Social Media Penetration: **67 → 71% (whole population)**
 Mobile Internet Users: **66 → 73.6 (million)**	 Daily Internet Usage: **6h30' → 6h23'**	 Mobile Social Media Users: **99% → 89.8%**
 Mobile Internet Connection: **30.39 → 39.59 MBPS**	 Fixed Internet Connection: **43.26 → 80.27 MBPS**	 Mobile Banking and Investment Services Usage: **36% → 54%**

Source: We Are Social (2020, 2023)

The modern payment system includes: (i) the Interbank Electronic Payment System (IBPS) and Automated Clearing House (ACH) for fast, secure transaction processing; (ii) Rapid growth of e-wallets, mobile apps, and QR codes, creating a diverse digital payment ecosystem.

This robust digital foundation facilitates CBDC adoption. Vietnamese users are technologically and psychologically prepared for new currency forms, evidenced by the surge in digital financial service usage and high cryptocurrency acceptance (among the world's highest). However, challenges in cybersecurity, data privacy, and system interoperability and stability must be addressed for CBDC development.

4.2. CURRENT STATE OF PRECONDITIONS FOR CBDC ISSUANCE BY THE STATE BANK OF VIETNAM

4.2.1. Policy Objectives

(1) Analysis of Current Conditions:

Vietnam has identified five policy objective groups for CBDC, aligned with global trends and national specifics: (i) Financial Inclusion: A top priority (Decision 149/QĐ-TTg), emphasizing public-private collaboration, system safety, technology application, security, and expanded access for underserved groups; (ii) Payment Efficiency: Reflected in Decision 1813/QĐ-TTg, leveraging Industry 4.0 to modernize infrastructure. The SBV leans toward wholesale CBDC to enhance interbank efficiency and utilize existing infrastructure; (iii) Payment System Resilience: Decision 810/QĐ-NHNN on banking digital transformation emphasizes innovative management and advanced risk monitoring tools; (iv) Curbing Illicit Transactions: CBDC's traceability is expected to aid in combating money laundering, tax evasion, and terrorism financing; (v) Strengthening Monetary Sovereignty: Developing an official digital currency counters private digital currencies, ensuring monetary policy effectiveness and financial security. These objectives, informed by international experiences (e.g., IMF), reflect a cautious approach, initially prioritizing wholesale CBDC.

(2) Evaluation Results for Conditions and Criteria:

- Overall Score: 7/10 (positive).
- Criteria Details: "Reducing transaction costs" (7.62) scores highest, followed by "Compatibility with existing systems" (7.1). "Supporting monetary policy" (6.95) and "Clarity of objectives" (6.78) need improvement, with "Supporting financial inclusion" (6.56) scoring lowest.
- By Stakeholder Group: Policymakers/experts are most optimistic (especially on cost reduction and system compatibility). Individual users are positive (on monetary policy support and cost reduction). Financial institutions/payment intermediaries are cautious (on financial inclusion). Businesses score lowest (on objective clarity).
- Overall Assessment: High consensus on cost reduction and system compatibility. The perception gap between policymakers and businesses needs addressing.

4.2.2. Legal Framework

(1) Analysis of Current Conditions:

The current legal framework has significant gaps: (i) Issuance/Management Authority: The SBV Law 2010 and Decree 40/2012 cover only physical currency. Decree 101/2012 assigns the SBV indirect oversight of non-cash payments; (ii) Legal Status: No regulation defines or recognizes CBDC as legal tender. The Civil Code 2015 and SBV Law 2010 do not include CBDC; (iii) Privacy/Security: No specific

regulations address the SBV's obligations for CBDC transaction confidentiality (currently applied only to financial institutions/payment intermediaries). Coordination mechanisms and responsibility scopes need clarification; (iv) Risk Management Framework: Lacks regulations for system disruptions, connectivity losses, fund flows between CBDC and other currencies, dispute resolution, and liability determination (especially for cross-border transactions); (v) AML/CFT Compliance: The 2022 Anti-Money Laundering Law does not cover CBDC specifics. Regulations on KYC, transaction limits, monitoring, and investigation coordination need supplementation. A comprehensive legal framework for CBDC is therefore urgently needed.

(2) Evaluation Results for Conditions and Criteria:

- Overall Score: 6.16/10 (lowest).

- Criteria Details: No criterion exceeds 6.5. "Privacy protection and anti-money laundering" (6.35) scores highest, followed by "Issuance authority" (6.29). "Legal status" (6.14) and "Dispute resolution/risk management" (6.04) need priority, with "Privacy and data security" (6.01) scoring lowest.

- By Stakeholder Group: Policymakers/experts are cautious (6.04), concerned about dispute resolution and legal status. Individual users are most optimistic (7.02), particularly on legal status and security. Financial institutions/payment intermediaries are moderately positive (6.36), focusing on legal status. Businesses are most concerned (5.68).

- Overall Assessment: Consensus on the urgency of legal improvements. Significant perception gaps between experts and users. Priority should be given to user protection regulations (privacy, disputes).

4.2.3. Stakeholder Support

(1) Analysis of Current Conditions:

- Government Support: (i) Reflected in decisions (e.g., Decision 942/QĐ-TTg tasking the SBV with pilot research; Decision 1813/QĐ-TTg incorporating CBDC research into payment plans); (ii) Reinforced by digital transformation policies (e.g., Decision 06/QĐ-TTg on citizen data, with SBV collaborating with the Ministry of Public Security to leverage VNeID); (iii) Improved government implementation capability (IT infrastructure, human resources, investment); (iv) Strong digital transformation readiness in the Ministry of Finance and SBV; (v) Enhanced inter-agency coordination (e.g., Project 06, National Digital Transformation Program, payment integration with VNeID).

- Challenges: Pace of innovation, adaptation to new technologies, and inter-agency coordination issues (overlaps, lack of information-sharing mechanisms).

(2) Evaluation Results for Conditions and Criteria:

- Overall Score: 7.03/10 (highest).

- Criteria Details: "Private sector/financial institution collaboration" (7.28) scores highest, followed by "International organization participation" (7.26). "Academic/expert support" (7.07) is strong, while "Government/SBV approval" (6.70) and "NGO/community feedback" (6.81) are lower.

- By Stakeholder Group: Policymakers/experts are optimistic (7.29), valuing international and private sector collaboration. Individual users are positive (7.38),

trusting private sector and international capabilities. Financial institutions/payment intermediaries are balanced (6.84). Businesses are most cautious (6.61).

- Overall Assessment: High consensus on the positive role of private sector and international collaboration. Perception gaps exist between policymakers and businesses. NGO/community support remains limited.

4.2.4. Technological Capability

(1) Analysis of Current Conditions:

- Digital Infrastructure and Interoperability: High mobile penetration (139/100 people), broadband growth (15% annually), secure internet servers (3,128/million people), and internet usage (74%). IT R&D spending is 0.54% of GDP. IBPS and ACH systems have significant processing capability. NAPAS connects 95% of banks, implementing modern payment methods (QR, contactless).

- Security and Fraud Prevention: 95% of banks have digital transformation strategies, 88% plan full digitization. Security technologies (multi-factor authentication, biometrics, private blockchains) are applied. AI/ML reduces fraud (up to 60% in some cases).

- Digital Payment Infrastructure Development: 9/19 banking services are fully digitized. Cloud computing and microservices enhance processing and cost efficiency.

- Blockchain and Cryptocurrency Ecosystem: Vietnam leads globally in cryptocurrency adoption (2021–2022). Over 200 blockchain projects are active, with 7/200 top crypto firms founded by Vietnamese (e.g., Coin98, Axie Infinity).

- Limitations: Inconsistent cloud infrastructure, reliance on foreign providers, shortage of high-quality IT talent (DLT, blockchain, security), limited big data analytics capability, and lack of experience in operating large-scale digital payment systems.

(2) Evaluation Results for Conditions and Criteria:

- Overall Score: 6.46/10 (moderate).

- Criteria Details: "Digital infrastructure and interoperability" (6.98) scores highest, followed by "System processing and scalability" (6.81). "Data monitoring and analysis" (6.29) and "Security and fraud prevention" (6.22) are lower, with "Offline functionality" (5.99) scoring lowest.

- By Stakeholder Group: Financial institutions/payment intermediaries (high expertise) are most cautious (especially on offline functionality and security). Individual users are more optimistic (on infrastructure and monitoring). Businesses are cautious (on offline functionality). Policymakers are balanced, concerned about monitoring.

- Overall Assessment: Digital infrastructure is positively evaluated. Offline functionality is the biggest challenge. Significant perception gaps exist between experts and users regarding technical challenges.

4.2.5. End-User Acceptance of CBDC

(1) Analysis of Current Conditions:

- Effort Expectancy: Users are familiar with digital payments (85% use e-wallets/apps, 71% regularly). Technology complexity barriers are reduced. However, 15% of the population (rural/remote areas) faces access challenges.

- Performance Expectancy: Positive perceptions of digital payment benefits (79% prefer digital over cash). Online payment usage surged post-COVID-19 (43%). However, concerns about system stability persist.

- Social Influence: High community orientation, with technology adoption influenced by peers (VNeID reached over 50 million users annually). However, 65% still rely on family/friends' opinions.

- Facilitating Conditions: Strong foundation (164% smartphone penetration, 79% internet usage). Banking systems have digitized 9/19 services. However, technical support and user training are limited (only 45% of banks offer 24/7 support).

- System Trust: A major challenge. While 84% feel secure with digital payments, concerns about privacy and security remain. Financial fraud cases have risen (45%), impacting trust. Only 35% trust financial institutions' data protection capabilities. A comprehensive strategy is needed to enhance CBDC acceptance.

(2) Evaluation Results for Conditions and Criteria:

- Overall Score: 6.27/10 (second lowest).

- Criteria Details: "Motivation to use new digital payments" (6.65) scores highest, followed by "Digital technology access" (6.6). "Acceptance and readiness to use" (6.19) and "Trust in security/privacy" (6.11) are lower, with "Awareness and understanding" (5.79) scoring lowest.

- By Stakeholder Group: Individual users are most optimistic (6.90), particularly on motivation and access. Businesses are most cautious (5.32), concerned about awareness and trust. Financial institutions (6.17) and policymakers (6.29) are neutral, sharing concerns about public awareness.

- Overall Assessment: Significant gaps between users and other groups (1.58 points). Strong technology foundation and motivation exist, but awareness and trust are limited. A tailored market strategy is needed to build trust and deliver value.

4.3. ANALYSIS OF ANTECEDENTS OF BEHAVIORAL INTENTION TO USE CBDC IN VIETNAM

Table 4.1: SEM Model Results

Hi	Path	Coef. β	T-stats	P-value	Conclusion
H1	Self-Efficacy → Effort Expectancy	0.303	13.885	**	Accepted
H2.1	Effort Expectancy → Behavioral Intention	0.177	6.122	**	Accepted
H2.2	Performance Expectancy → Behavioral Intention	0.123	5.138	**	Accepted
H2.3	Social Influence → Behavioral Intention	0.107	4.420	**	Accepted
H2.4	Facilitating Conditions → Usage Behavior	0.233	11.617	**	Accepted
H3.1	Trust in CBDC → Behavioral Intention	0.302	10.167	**	Accepted

H3.2	Perceived Risk → Behavioral Intention	-0.031	2.141	*	Accepted
H3.3	Perceived Benefit → Behavioral Intention	0.214	9.416	**	Accepted
H4	Behavioral Intention → Usage Behavior	0.267	11.946	**	Accepted
	Moderation effects				
H5.1	Behavioral Intention × Resistance to Change → Usage Behavior	-0.032	2.040	*	Accepted
H5.2	Behavioral Intention × Global Brand Presence → Usage Behavior	-0.114	11.694	**	Rejected

*Notes: **p < 0.01, *p < 0.05.*

The dissertation confirms the critical role of UTAUT factors, with trust, perceived benefits, and facilitating conditions as primary drivers of CBDC acceptance in Vietnam. Notably, the strong positive impact of facilitating conditions and trust reflects Vietnam's market specifics.

However, the limited impact of resistance to change and the unexpected negative effect of global brand presence highlight potential barriers, requiring tailored strategies to promote user acceptance.

4.4. GENERAL ASSESSMENT OF PRECONDITIONS FOR CBDC ISSUANCE BY THE STATE BANK OF VIETNAM

4.4.1. Existing Strengths

- Policy Objectives: Relatively clear framework (7/10), with high expectations for transaction cost reduction (7.62), good system compatibility (7.1), and promising monetary policy support (6.95).

- Stakeholder Support: Strong support from most stakeholders (7.03/10, highest), facilitating implementation: robust private sector/financial institution collaboration (7.28), active international organization participation (7.26), and strong academic/expert contributions (7.07).

- Technological Foundation: Solid initial base (6.46/10), with strong digital infrastructure and interoperability (6.98) due to telecommunications/internet investments, promising system processing and scalability (6.81) via IBPS and ACH, and a thriving blockchain/cryptocurrency ecosystem.

4.4.2. Unmet Aspects

- Legal Framework: Significant gaps (6.16/10, lowest), lacking regulations on privacy/data protection (6.01), dispute resolution/risk management (6.04), and CBDC legal status (6.14).

- User Acceptance: Limited (6.27/10), with low awareness/understanding (5.79), weak trust in security/privacy (6.11), and a large evaluation gap between users and businesses (1.58 points).

- Technological Capability: Weaknesses in offline functionality (5.99), security/fraud prevention (6.22), and data monitoring/analysis (6.29).

- Evaluation Gaps: Significant differences between policymakers and businesses (0.6–0.8 points), indicating ineffective dialogue mechanisms.

- Resource and Experience Limitations: Shortage of high-quality IT talent, lack of experience in large-scale digital systems, and absence of small-scale CBDC pilots.

4.4.3. Causes of Unmet Conditions

- ***Objective Causes:*** (i) Novelty and complexity of CBDC, complicating legal and implementation frameworks; (ii) Developing economy characteristics: high cash usage (>10%), persistent habits (especially rural areas), and limited digital payment access for some populations; (iii) Uneven digital infrastructure development: urban-rural disparities, with ~2,000 villages lacking mobile/internet coverage, hindering CBDC access; (iv) Rapid technological and cybersecurity changes: evolving platforms and sophisticated cyber threats.

- ***Subjective Causes:*** (i) Lack of a comprehensive strategy and clear roadmap: fragmented preparations, inefficient resource utilization; (ii) Limited communication and education: non-systematic programs, inaccurate information, and insufficient training for bank staff; (iii) Inconsistent inter-agency coordination in legal development: delays in law amendments due to differing views and unclear responsibility delineation; (iv) Inadequate R&D investment for CBDC technology: limited budgets, ineffective private investment attraction, and insufficient focus on high-quality IT training.

Chapter 5
DIRECTIONS AND SOLUTIONS FOR FOSTERING PRECONDITIONS FOR CENTRAL BANK DIGITAL CURRENCY ISSUANCE BY THE STATE BANK OF VIETNAM

5.1. CONTEXT, DIRECTIONS, AND OBJECTIVES

5.1.1. Economic Context of Vietnam and the World

The global economy has faced challenges (inflation, geopolitical tensions, supply chain disruptions) but has also witnessed a digital technology surge.

Vietnam stands out with impressive socioeconomic achievements (per capita GDP increased 2.6 times, exceeding USD 3,500; poverty rates significantly reduced). Macroeconomic recovery is strong (8% growth in 2022, 5% in 2023). Vietnam is projected to have high growth potential (top 5 globally by 2030, top 3 by 2050) and significant GDP scale improvements (PPP).

This macroeconomic context provides favorable conditions for CBDC development: (i) High growth supports investment resources; (ii) Financial sector digital transformation offers technical and experiential foundations; (iii) Supply chain shifts demand modern payment systems. However, challenges include uneven development, digital divides, global economic volatility, and maintaining macro stability.

5.1.2 . Directions and Objectives for Establishing Preconditions for CBDC Issuance

- ***Overall Objectives:*** (i) Synchronously enhance all five precondition groups (by 2025, all scoring >7/10, prioritizing legal framework, user acceptance, and technological capability; maintaining stakeholder support and policy objectives); (ii) Ensure feasibility and resource alignment (clear, phased solutions leveraging existing infrastructure/experience); (iii) Promote sustainability and long-term adaptability (flexible, open conditions; increased technological autonomy; human resource development; international cooperation).

- ***Directions and Specific Objectives:*** (i) Policy Objectives: Refine the strategic framework, clarify objectives, enhance financial inclusion support, improve system compatibility, and optimize monetary policy support and cost reduction; (ii) Legal

Framework: Develop a comprehensive regulatory system (SBV authority, privacy/AML regulations, dispute resolution/risk management, CBDC legal status, data security); (iii) Stakeholder Support: Strengthen government/SBV commitment, promote private sector/financial institution collaboration, expand international cooperation, leverage academic/expert input, and increase community consultation; (iv) Technological Capability: Upgrade infrastructure and human resources (modernize infrastructure, enhance security/fraud prevention, improve processing/scalability, develop offline transactions, and refine data monitoring/analysis) - Target: >7.5/10 by 2025; (v) User Acceptance: Intensify communication and education (increase awareness, promote readiness, improve technology access, build trust in security/privacy, and stimulate motivation) - Target: >7.2/10 by 2025.

5.1.3. Directions and Objectives for CBDC Issuance

- ***Development Objectives:*** Propose a hybrid CBDC model with a two-tier structure (SBV for issuance/management, intermediaries for distribution). Initially (2025–2026), prioritize wholesale CBDC; later (from 2027), expand to controlled retail CBDC. Use combined DLT and centralized technologies.

- ***Implementation Roadmap:*** (i) Phase 1 (2025–2026): Pilot wholesale CBDC (5–7 major commercial banks, 2–3 payment intermediaries), focusing on interbank payments and technical trials; (ii) Phase 2 (2026–2027): Expand wholesale CBDC system-wide; pilot retail CBDC in 2–3 major cities (200–300,000 users); Phase 3 (from 2027): Evaluate results, refine legal frameworks, and roll out retail CBDC nationwide (prioritizing retail payments, cross-border transactions, and monetary policy support).

- ***Collaboration Requirements:*** (i) Establish a robust coordination mechanism (SBV as the core; commercial banks/financial institutions for distribution; technology firms for technical support); (ii) Clearly define responsibilities, processes, and information sharing.

5.2. SOLUTIONS FOR FOSTERING PRECONDITIONS FOR CBDC ISSUANCE BY THE STATE BANK OF VIETNAM

5.2.1. Policy Objectives

- ***Proposed Solutions:*** (i) Refine the CBDC development strategy framework; (ii) Enhance financial inclusion policy effectiveness; (iii) Improve monetary policy implementation efficiency; (iv) Develop a multidimensional impact assessment framework; (v) Establish a macroeconomic policy coordination mechanism; (vi) Optimize transaction costs; (vii) Enhance compatibility with existing systems.

- ***Roadmap:*** (i) 2024–2025: Finalize strategy and technical standards; (ii) 2025–2027: Develop monetary policy tools, optimize costs, and pilot financial inclusion initiatives; (iii) Post-2027: Expand nationwide. Requires close SBV and ministry coordination and financial sector collaboration.

5.2.2. Legal Framework

- ***Proposed Solutions:*** (i) Amend and supplement the SBV Law; (ii) Develop specialized CBDC regulations; (iii) Refine privacy and data security regulations; (iv) Establish dispute resolution and legal risk management mechanisms; (v) Strengthen regulatory enforcement and monitoring systems; (vi) Develop a data governance legal framework; (vii) Establish legal mechanisms for collaboration and shared risk management responsibilities.

- ***Roadmap:*** (i) 2024–2025: Prioritize SBV Law amendments and basic regulations; (ii) 2025–2027: Complete privacy/risk regulations and conduct trials; (iii) Post-2027: Continuously update based on practical outcomes. Requires SBV, Ministry of Justice, National Assembly Legal Committee coordination, community

consultation, and international learning.

5.2.3. Stakeholder Support

- ***Proposed Solutions:*** (i) Strengthen government agency commitment and coordination; (ii) Promote robust private sector collaboration; (iii) Expand international cooperation; (iv) Enhance academic and expert consultation; (v) Increase civil society engagement; (vi) Develop incentive and benefit-sharing mechanisms; (vii) Establish an open collaboration and innovation platform.

- ***Roadmap:*** (i) 2024–2025: Establish coordination mechanisms, public-private partnerships, and international collaboration; (ii) 2025–2027: Intensify research, consultation, and pilots; (iii) Post-2027: Strengthen and expand collaboration networks. Requires SBV and stakeholder coordination based on transparency, efficiency, and mutual benefits.

5.2.4. Technological Capability

- ***Proposed Solutions:*** (i) Upgrade digital infrastructure and interoperability; (ii) Enhance security and fraud prevention solutions; (iii) Develop system processing and scalability capabilities; (iv) Improve offline transaction technology; (v) Enhance data monitoring and analysis capabilities; (vi) Develop technology testing and validation platforms; (vii) Establish an intelligent technology governance system.

- ***Roadmap:*** (i) 2024–2025: Focus on upgrading infrastructure and core technologies; (ii) 2025–2027: Develop advanced features (offline, big data) and conduct trials; (iii) Post-2027: Optimize, expand, and integrate new technologies.

5.2.5. User Acceptance

- ***Proposed Solutions:*** (i) Intensify communication and education efforts; (ii) Build trust through controlled trials and transparency; (iii) Improve user experience and utility; (iv) Ensure privacy and data security; (v) Design tailored incentive programs; (vi) Establish comprehensive user protection mechanisms.

- ***Roadmap:*** Aligned with technological capability solutions.

5.3. RECOMMENDATIONS

5.3.1. To the Central Committee

Recommendations: (i) Issue a dedicated resolution on national digital currency development; (ii) Direct local Party committees and authorities to strengthen leadership in CBDC implementation; (iii) Integrate CBDC development into resolutions and directives on the digital economy and transformation; (iv) Enhance leadership in promoting international CBDC cooperation and digital financial integration.

5.3.2. To the National Assembly

Recommendations: (i) Prioritize amendments to the SBV Law 2010; (ii) Develop and enact a Digital Payments Law; (iii) Review and adjust related laws for consistency; (iv) Strengthen oversight of CBDC implementation; (v) Approve key investment programs and projects.

5.3.3. To the Government

Recommendations: (i) Develop and issue a national CBDC development strategy (2030 vision); (ii) Establish and operate a National CBDC Development Steering Committee; (iii) Develop comprehensive incentive and support mechanisms for stakeholders; (iv) Increase R&D investment in CBDC technology; (v) Establish monitoring and evaluation mechanisms for implementation effectiveness; (vi) Develop a comprehensive communication and awareness-raising plan.

CONCLUSION

First, the dissertation systematically synthesizes the theoretical and practical foundations of CBDC and its preconditions for issuance. CBDC is conceptualized as a new form of legal tender in the Industry 4.0 context, with significant impacts on financial systems, monetary markets, and the global economy. The dissertation constructs a two-stage theoretical framework: Stage 1 (establishment) focuses on foundational preconditions (policy objectives, legal framework, stakeholder support, and technological capability), and Stage 2 addresses market feasibility (end-user acceptance). Additionally, it analyzes CBDC implementation experiences in countries like China, the Bahamas, and Singapore, drawing valuable lessons for Vietnam, particularly in building sustainable and integrated digital payment systems.

Second, the dissertation provides a detailed analysis of the current state of preconditions for CBDC issuance in Vietnam, based on the proposed framework. Findings indicate: (i) Policy objectives are relatively clear but require further specification to support financial inclusion and modernize payments; (ii) The legal framework has significant gaps, particularly in privacy, data security, and CBDC legal status; (iii) Stakeholder support is uneven, necessitating stronger public-private partnerships; (iv) Technological capability shows progress but requires further investment in digital infrastructure and security; (v) Market feasibility reflects high public interest but concerns about security and privacy. These insights identify areas for improvement to facilitate CBDC implementation in Vietnam.

Third, empirically, the dissertation identifies and analyzes key factors influencing Vietnamese users' behavioral intentions to use CBDC payment services. PLS-SEM results show: (i) Self-efficacy positively impacts effort expectancy; (ii) Behavioral intention is driven by effort expectancy, performance expectancy, social influence, user trust, and perceived CBDC benefits; (iii) Perceived CBDC risks negatively affect behavioral intention; (iv) Facilitating conditions and behavioral intention positively correlate with CBDC usage; (v) Resistance to change and global brand presence negatively impact the relationship between behavioral intention and usage.

Fourth, the dissertation proposes solutions to enhance each precondition for CBDC issuance in Vietnam. These include integrating CBDC into financial inclusion strategies, optimizing transaction costs, developing specific privacy and data security regulations, strengthening public-private partnerships, and investing in digital infrastructure and public awareness. These solutions aim to create a breakthrough in building a secure, transparent, and efficient digital financial system.

Lastly, the dissertation offers significant practical contributions to the SBV and policymakers in developing and implementing CBDC. Beyond a novel theoretical approach, it provides highly practical recommendations supported by multi-stakeholder survey data, ensuring feasibility and alignment with Vietnam's socioeconomic conditions. Besides, it contributes to shaping modern digital economic management strategies, optimizing monetary policy effectiveness, promoting financial inclusion, and enhancing national competitiveness amid robust international integration and digital transformation.