NEPAL RASTRA BANK

Digital Economy and Financial Innovation : Implication for Monetary Policy in Nepal

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Presentation Roadmap

- Concept of digital economy & financial innovation
- Evolution of digital payment system in Nepal
- Implications for monetary policy
- Way forward
- Concluding remarks

Concept of digital economy & financial innovation

Concept of digital economy

- Economic activities driven by digital technologies and internet/mobile networks, including
  - e-commerce, digital platforms, online services, gig work, Fintech
  - ICT (Information and communication technology) infrastructure like broadband, cloud computing etc.
  - Use of Big data, MA (Machine learning), APIs (Application programming interferes), online marketplace by economic agents – for robust decision making process.
  - the use of AI (for automation purpose)

Concept of digital economy

It involves **Financial Innovation -** The use of technology to create new financial services, products, and business models.

- **Digital Payments:** Wallets, QR codes, IPS, Real-Time Gross Settlement (RTGS) systems.
- **FinTech Lending:** Peer-to-Peer (P2P) platforms, algorithmic credit scoring.
- **Digital Currencies:** Central Bank Digital Currency (CBDC), crypto currencies, stable coins.
- **Decentralized Finance (DeFi):** Financial services on block chain without traditional intermediaries.
- AI
  - Automation – enhance efficiency and productivity
  - Digitalization of automation

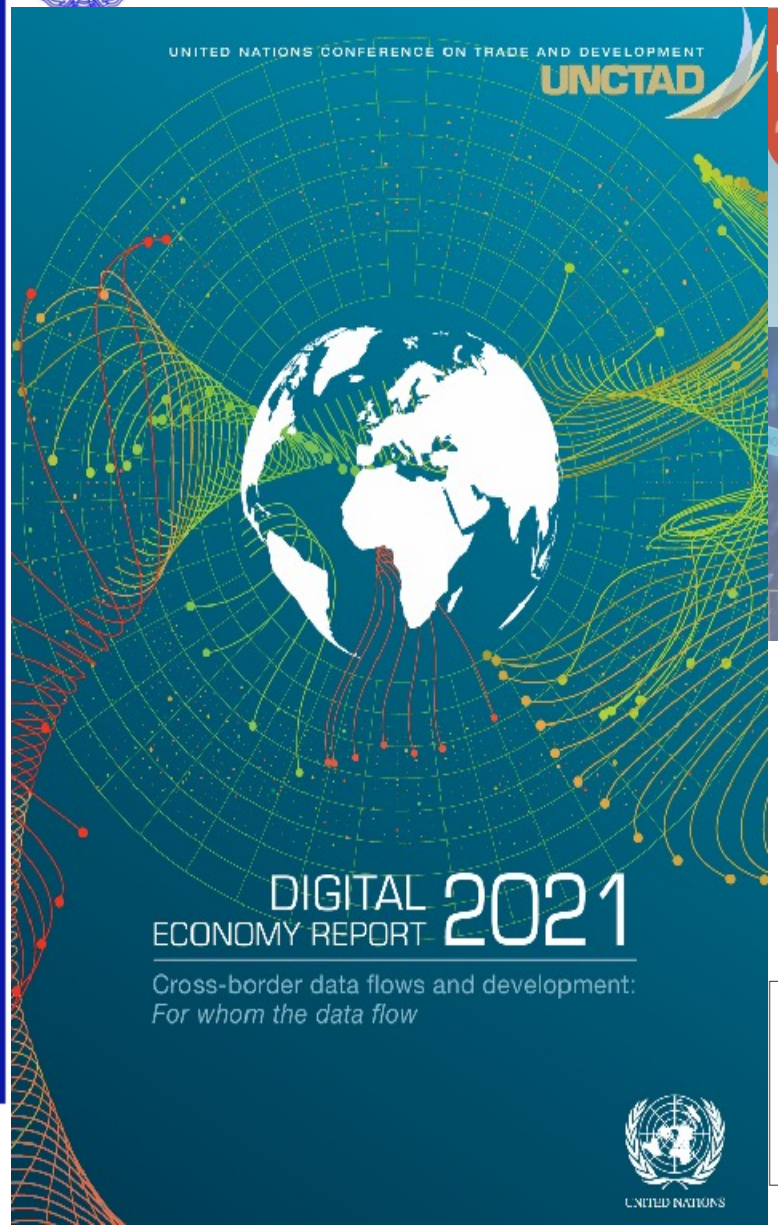
Global initiative..... digitalization is driven by both internal and external motivation

- **Globally, policy makers are focused on addressing**
  - economic activities enabled by **digital technologies**, especially the internet, mobile communication, cloud computing, Artificial Intelligence, and digital platforms.
- **Countries around the globe have been adopting such technology for**
  - **Establishing regulatory framework**
  - **Monitoring digital governance platforms**
  - **Ensuring cyber security for controlling its misuse**
- **Global Standard Setters are more active**
  - **FATF on AML/CFT regime**
  - **BIS, BCBS, FSB on financial matters**
  - **Payments and settlement related**
  - **Securities trading related**
  - **Insurance related**

Global initiative on digitalization

- OECD
- UNCTAD
- IMF
- World Bank Group

Attention on digital payment innovation worldwide...



FATF

GUIDANCE FOR A RISK-BASED APPROACH

VIRTUAL ASSETS AND VIRTUAL ASSET SERVICE PROVIDERS

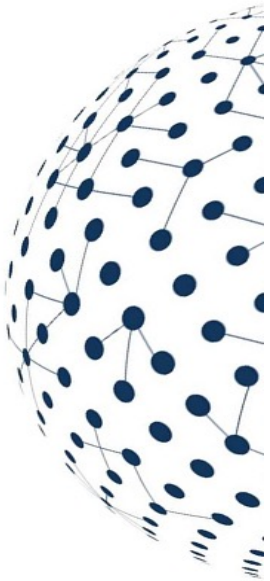
IAIS International Association of Insurance Supervisors

IAIS Report on FinTech developments in the insurance sector

FSB FINANCIAL STABILITY BOARD

Regulation, Supervision and Oversight of "Global Stablecoin" Arrangements

Progress Report on the implementation of the FSB High-Level Recommendations



December 2022

Basel Committee on Banking Supervision

Issues, Risks and Regulatory Considerations Relating to Crypto-Asset Trading Platforms

Final Report

Sound Practices

Implications of fintech developments for banks and bank supervisors

February 2018

OICV-IOSCO

October 2021

Central Banks can not remain passive given global environment

- **BIS (Bank for International Settlements):** Highlights that the "digital economy is reshaping money itself." Emphasizes the need for central banks to stay at the forefront of payment systems and explore CBDCs to maintain monetary sovereignty.
- **IMF (International Monetary Fund):** Focuses on macroeconomic implications, including potential impacts on capital flows, financial stability, and the effectiveness of monetary and fiscal policy.
- **FSB (Financial Stability Board):** Monitors and assesses vulnerabilities from crypto-assets and global stablecoins, focusing on financial stability risks.
- **BCBS (Basel Committee on Banking Supervision):** Developing prudential treatment standards for banks' exposures to crypto-assets.
- CBDC preparation by many countries : few countries lunched fully. Some countries adopted partially, many countries in R&D phase.
- Other Private currency – issues of crypto currency and stable coins

Central banks need to perform traditional function in a better way

- **Traditional Role:** Issuer of physical currency, banker to the government & commercial banks, conductor of monetary policy, regulator and supervisor.
- **New Digital-Age evolving roles:**
  - **Operate & Oversee** critical digital payment infrastructures (e.g., NRB's upcoming NIPS - National Payment Interface System).
  - **Explore** CBDC.
  - **Regulate and supervise** banks and non-bank FinTech entities.
  - **Develop new data analytics capabilities** to monitor a more complex, data-rich economy.

Central banks need to be more proactive in

- **Digital Payments:**
  - Reduce cash usage, increase transaction velocity, lower costs, enhance financial inclusion.
  - Promote formalization of economic activities
- **FinTech Lending:**
  - Uses alternative data (e.g., mobile usage, utility payments) for credit scoring, potentially reaching segments underserved by traditional banks.
  - Can dis-intermediate banks, affecting their deposit base and profitability, which has implications for the bank-centric monetary policy transmission.
- **Cashless economy – future of money??**
  - Crypto currencies (e.g., Bitcoin)
  - stable coins
  - Central Bank Digital Currency (CBDC)

Evolution of Digital Payment System in Nepal

Evolution of digital financial system in Nepal.....

- Early payment landscape
  - Payments were dominated by cash and cheques - The use of SWIFT was an usual practice, started internet from late 1990s.
- Early e-banking, cards, and ATM-based services
  - Commercial banks introduced internet banking, debit cards, and the ATM networks in the 2000s, laying foundation for retail digital financial services
- Account-to-account rails through NCHL and connectIPS
  - NCHL was established on 2008
- Rise of digital wallets and QR-based retail payments
  - Launch of eSewa around 2009 and of Khalti in 2017 expanded wallet-based payments, later complemented by interoperable QR solutions such as NepalQR for merchants.
- A dedicated Payments Systems Department was established in 2015 to focus on strategy, regulation, oversight, and innovation leadership.

Evolution of digital financial system in Nepal.....

- Payment and Settlement Act, 2019
  - recognized electronic instruments, settlement and netting, enabling NRB to license, supervise and oversee key payment infrastructures.
- RTGS and high-value payments as a major milestone
  - The launch of the RTGS on September 2019 enabled real-time settlement of large-value transactions
- Digital Nepal Framework, 2019
  - National vision to use the digital technologies as a driver of economic transformation, connectivity, inclusion, and better public service delivery.
- Legal reforms and RTGS as a system-wide milestone
  - The Payment and Settlement Act, 2019 and bylaws empowered NRB to license PSOs and PSPs and operate RTGS, which began large-value real-time settlement in September 2019.
- Process towards establishing a Neo Bank. Drafted AI guidelines
- Journey toward CBDC started – in R&D phase

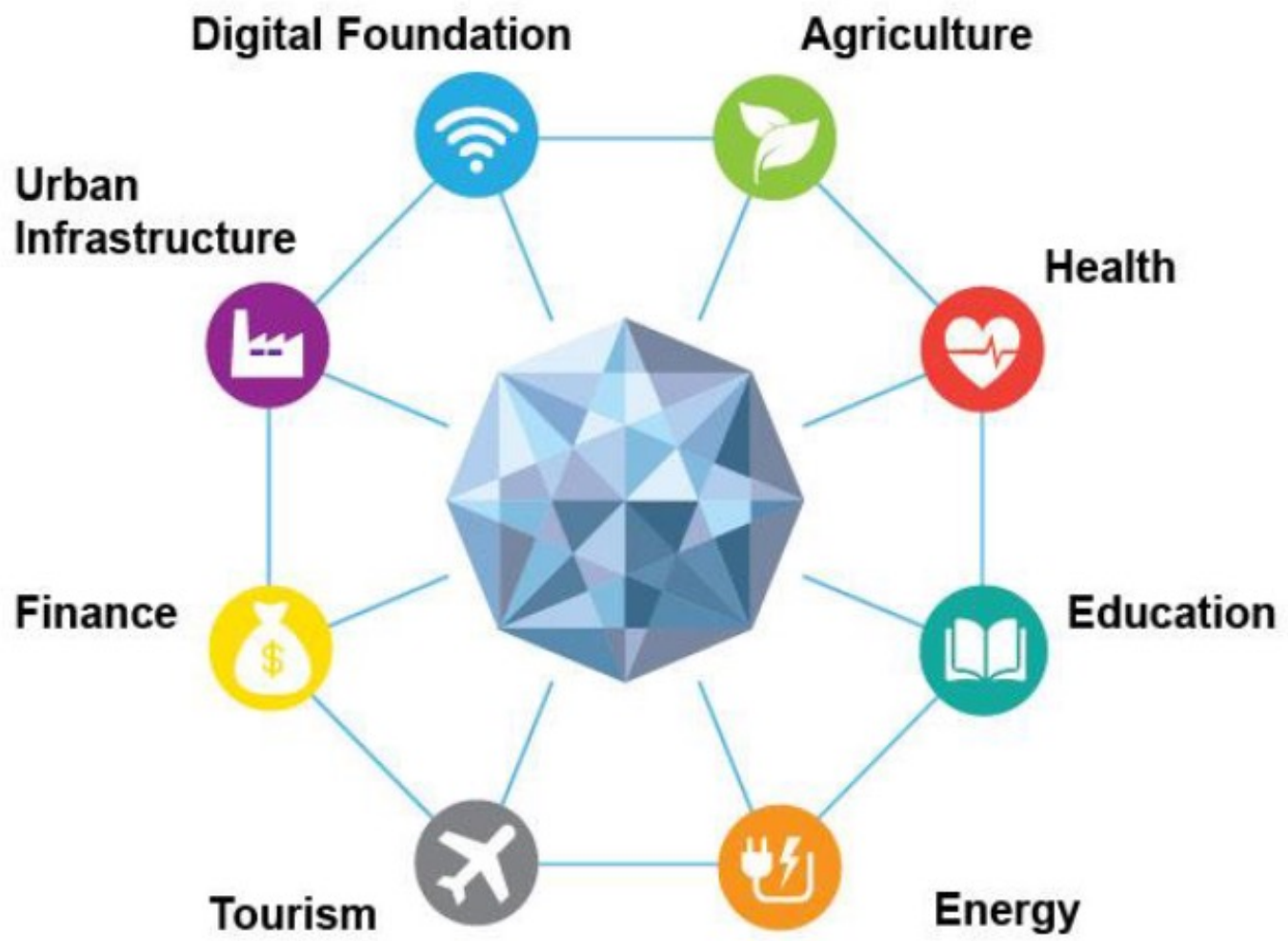
Digital Nepal Framework, 2019 – Unlocking Nepal's Growth Potential

- It envisage of expediting digitalization across various sectors of economy – includes 8 sectors and 80 initiatives.
- Prime Minister chairs the Committee
- Three dimension:

  (a) Innovation/skills,

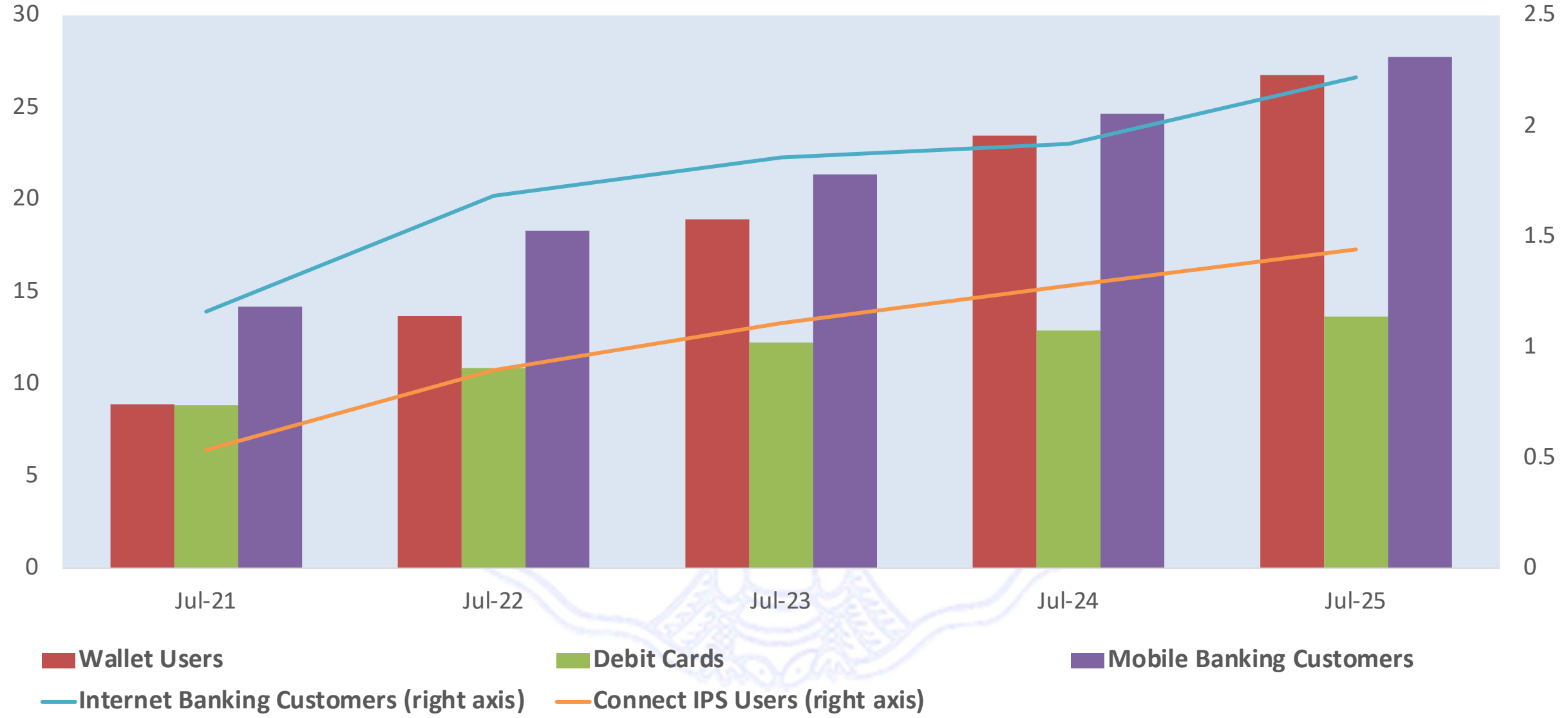
  (b) Technology/Infrastructure,

  (c) Entrepreneurship/ PPP

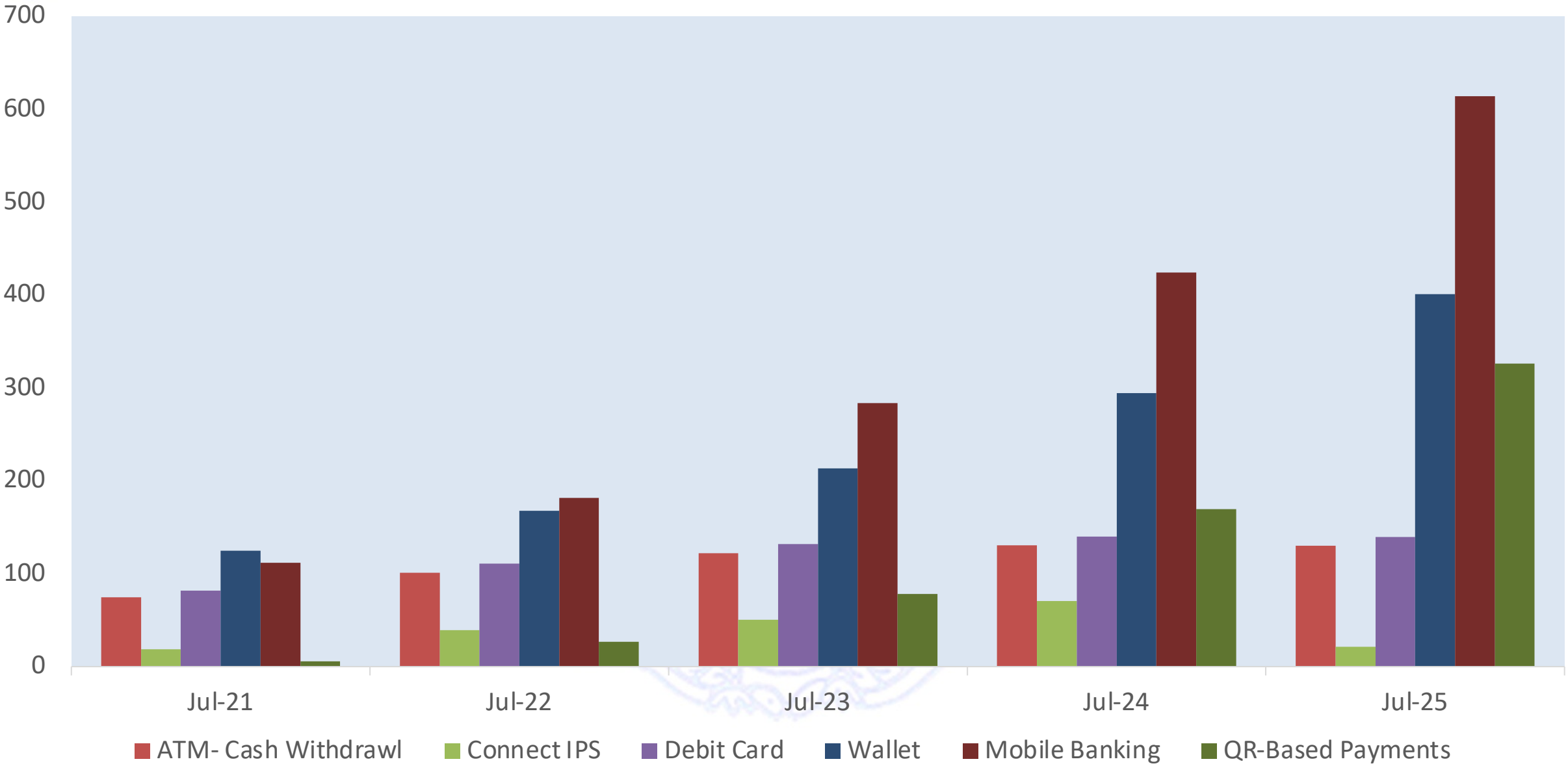


Status of digital payments in Nepal

Access on Payment Systems: Number of Users (in Million)



Usage of Payment Systems : No of transactions (Million)



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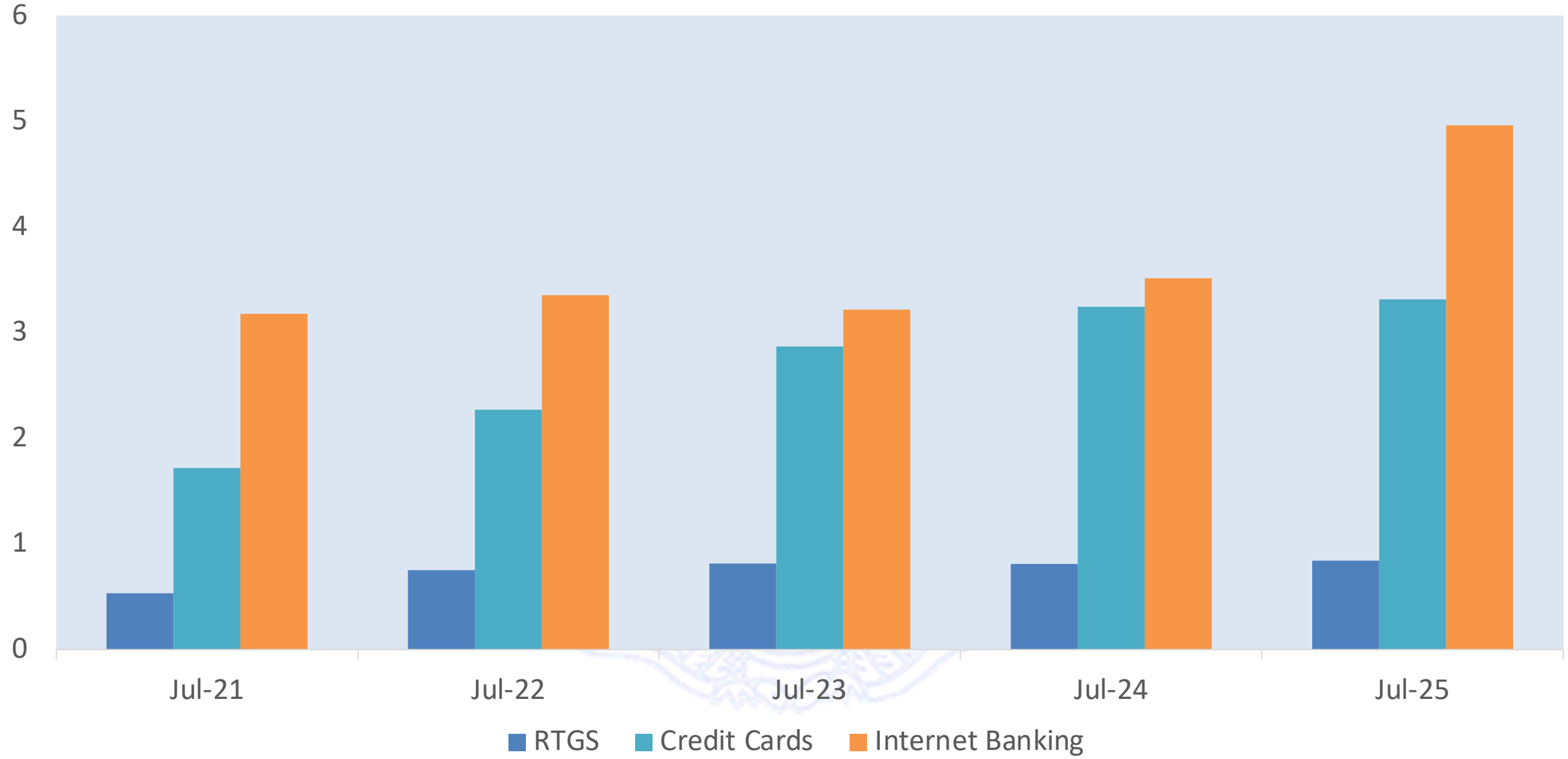
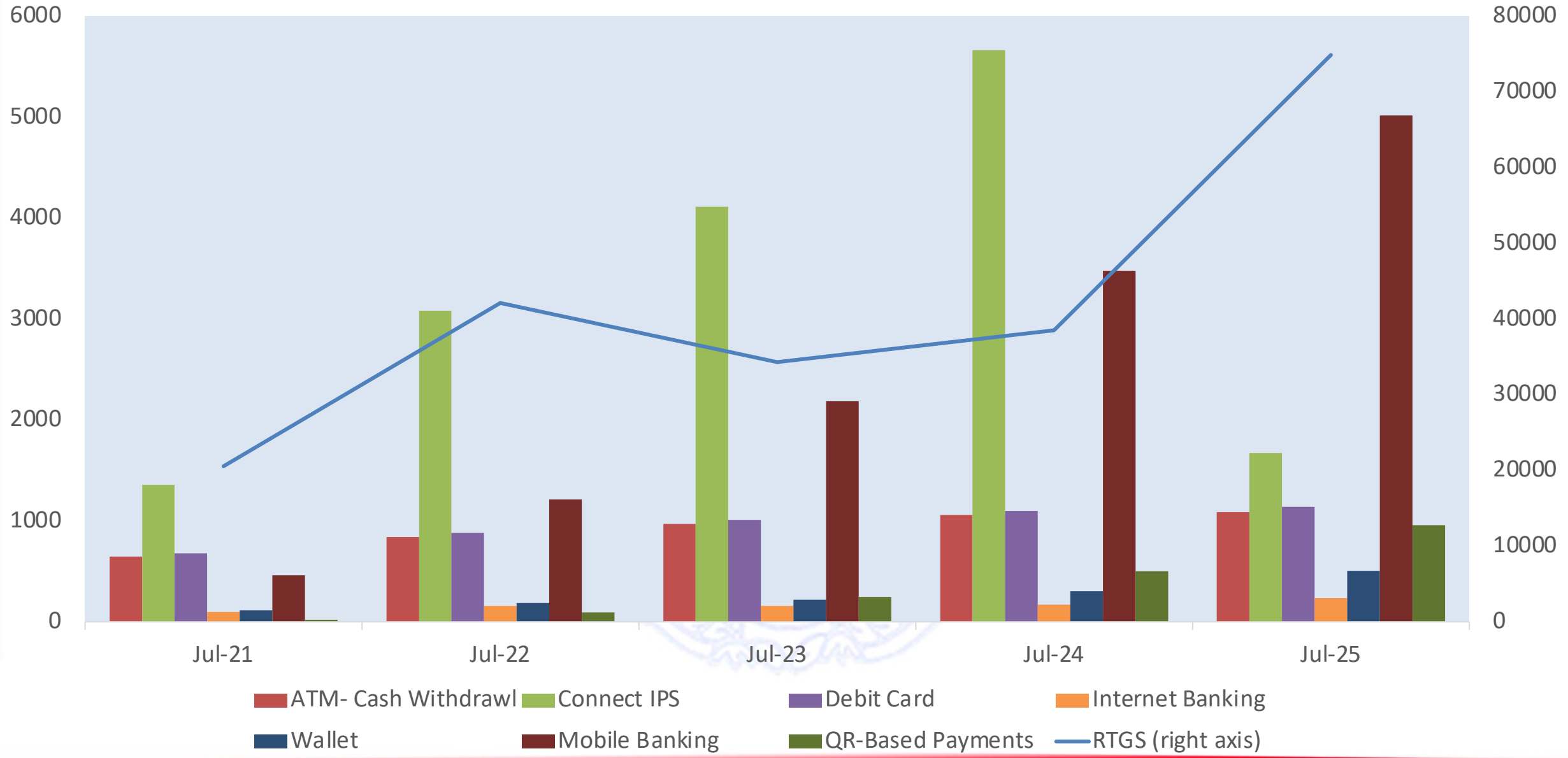
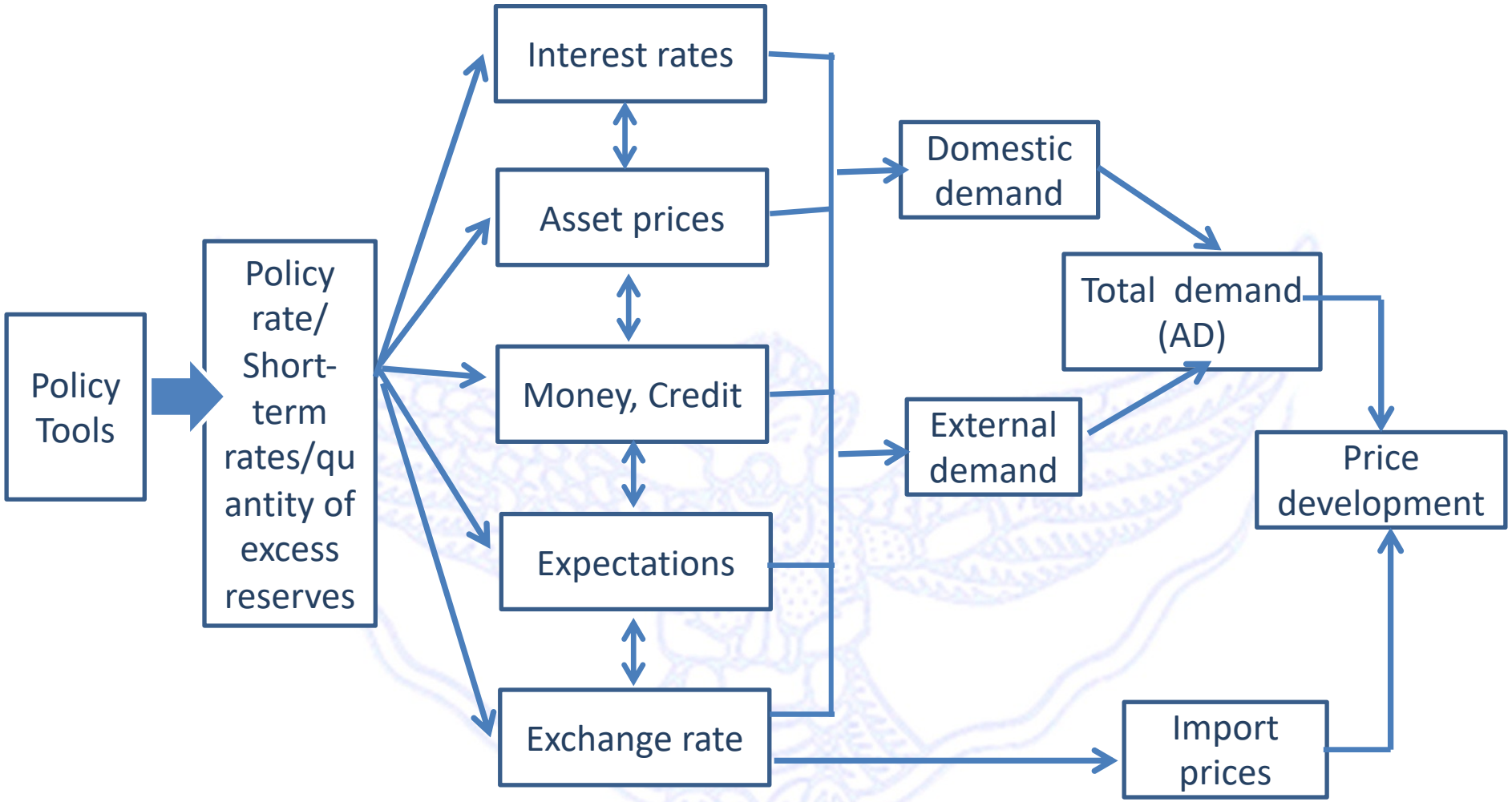


Usage of Payments Systems: Transactions Volume (Rs. billions)



Implication for Monetary Policy

Monetary Policy Transmission Channels



Further impact by digitalization – Transaction cost, intermediation cost, service quality, access

Literature Review on digital payment

- Linkages between payments, inclusion and monetary policy
  - Digital payments support financial inclusion, reduce cash handling, increase transparency and provide better data for the analysis.
- Digital payments and e-money reshape demand for broad money
  - Cheaper, instant digital payments reduce cash holdings, raise money velocity and alter relationships between income, rates and liquidity preferences (Auer et al., 2020; BIS, 2021).
- FinTech credit, market-based finance and non-bank lenders
  - Online platforms and non-bank intermediaries extend credit outside banks, redistributing who sets lending conditions and where risks reside (Pazarbasioglu et al., 2020).
- Big Tech platforms combine data, network effects and finance
  - Large technology firms may internalize payments, credit and commerce, generating concentration, data power and complex regulatory questions (BIS, 2019; Carstens et al., 2021).

Literature Review on digital payment

- Digitalization changes classical transmission channels
  - Affecting pricing, information, behavior, and market structure, even when headline policy remains unchanged.
- Interest rate channel and pricing of digital deposits
  - Digital accounts and wallets can adjust rates rapidly, altering how policy moves deposit pricing, margin compression, and saving–consumption choices (Huang et al., 2020).
- Expectations channel and real-time information environments
  - Real-time news, the dashboards and social media can accelerate the expectation formation, making communication both powerful and more fragile for the central banks (IMF, 2018).

Impact on Monetary Policy Transmission

Money Demand & Velocity: Less Predictable Relationship

- **Traditional View:** Stable money demand allows use of monetary aggregates (M2) as a policy guide.
- **Digital Disruption:**
  - **Falling Cash Demand:** Reduces relevance of M0.
  - **Unpredictable Velocity:** Digital payments make spending faster, increasing the velocity of money. The link between M2 and inflation becomes more volatile.
- **Implication for NRB:** Reliance on monetary aggregates and excess liquidity as a primary indicator becomes riskier.
- A shift towards an interest-rate-based framework is essential.

Impact on Monetary Policy Transmission

Credit Channel : Blurred Credit Channel when banks are not only the credit providers

- **Bank Lending Channel:**
  - **Weakening:** If FinTech and capital markets provide significant credit, NRB's policy actions (e.g., changing reserve requirements) have a smaller impact on overall credit conditions.

- **Balance Sheet Channel:**
  - **Could Strengthen:** FinTech lending to SMEs using alternative data can make investment less sensitive to interest rates, improving capital allocation efficiency.

Impact on Monetary Policy Transmission

Exchange Rate Channel: Careful about external shocks

- **Easier Cross-Border Flows:** Digital platforms facilitate faster remittances and capital movements.
- **Risk of "Digital Dollarization":**
  - Citizens might easily hold and transact in global stablecoins (e.g., pegged to USD).
  - This weakens demand for the Nepali Rupee.
  - Makes the exchange rate more volatile and sensitive to global crypto-markets, if peg is replaced by floating regime
  - Complicates NRB's FX management and its role as lender of last resort *in domestic currency*.

Impact on Financial System

- A high level of digitalization helps to
  - Reduce cost of cash: printing, security, transportation, low level staffs etc.
  - Reduces number of financial bank branches
  - Improve governance – rule based/faceless
  - Reduce informal market, tracking financial transaction, enhance tax
  - Also reduces employment in financial system ??

- The use of AI: Help to enhance efficiency and productivity, supports for automation
  - Enhance economic growth
  - Fosters inequality??
    - Unclear about job creation
    - Earning/income disparity ??

Impact of digital innovation : CBDC, DLT, and the Open Finance

- Central bank digital currency design choices and trade-offs
  - Need to choose between retail or wholesale models, account or the token systems, and degrees of the anonymity, programmability, and the private intermediaries.
- Potential effects of CBDC on bank funding and intermediation
  - A well-designed CBDC may improve the resilience and competition, while it may destabilizing bank deposits, credit supply, and the maturity transformation processes.
- Distributed Laser Technology (DLT) and tokenization in the securities and collateral
  - Distributed ledgers and tokenized assets may enable near real-time securities settlement improving the collateral mobility and reducing the counterparty and settlement risks.
- Role of innovation sandboxes, pilots, and cooperation
  - Sandboxes and pilots allow learning-by-doing with the strict limits, while regional forums share experiences on the CBDC, instant payments, and the digital regulatory approaches.

Impact on Financial System

- **The use of CBDC/Neo Banks**
  - Likely to change the financial system landscape
  - Reduce the cost: printing money, security, transportation, staff
  - Demands the use of technology
  - Enhance governance and reduce informal market
  - Enhance access to finance

Risks and Constraints

Challenges of the digital transformation

Internal Challenges

- Infrastructure, connectivity, and the reliability gaps
  - Patchy broadband, weak last-mile connectivity, frequent power issues and high service costs outside urban centres limit access to real-time digital payments and services.
- Skills, literacy, trust and behavioral frictions
  - Low digital and financial literacy, language barriers, fear of fraud and strong comfort with cash
- Institutional capacity, fragmentation and legacy systems
  - Overlapping mandates, manual back-office processes, limited supervisory technology and slow project execution constrain NRB and government in steering complex digital ecosystems.

Challenges of the digital transformation..

External Challenges

- Dependence on foreign platforms and technologies
  - Global card schemes, cloud providers, app stores, and big-tech platforms hold bargaining power, shaping pricing, data usage and technical standards small economies must negotiate.
- Cross-border risks, regulation, and the compliance pressures
  - Cyber threats, data-location debates, evolving AML/CFT norms, and potential capital-flow volatility through the digital channels raise new demands on oversight, coordination and resilience.

Digital Economy: Risks and Constraints

- The technologies can create new vulnerabilities,
  - making it harder to safeguard stability, manage crises, and preserve monetary sovereignty over the time.
- Cyber, operational, and concentration risks in systems
  - Outages, hacking, and third-party failures in large payment providers can disrupt the transactions, reduce confidence and complicate the central bank operations and backstops.
- Shadow credit and regulatory arbitrage across the institutions
  - Platform lending and non-bank credit can migrate the activities outside the fully regulated entities, weakening the prudential safeguards, reporting quality, and supervisory visibility.

Implications, Way Forward and Conclusion

Current implications

- Enhance digital literacy
- Enhance access to finance digitally – revised bank branch policy today
- Need to enhance work culture (24/7) and monitoring financial indicators
  - Bank run, crime, security etc
- Focus on big/micro data for policy analysis and decision making,
- Enhance cyber security and data storage
- Need to strengthen regulatory and supervisory skills
- Developing regulatory and supervisory framework after Neo Bank and CBDC

Roadmap

- Continue research and promote innovation - no choice other than adopting new technology and enhancing digitalization
- Investment on human capital and technology remains critical
- Develop skills to regulate and supervise techno-based and digital financial system
- Enhance cyber security and data storage
- Build data analytics capacity by developing centralized database management and big data analytics system in place.
- Establish the regulatory sandbox and engage the team of experts on "innovating the innovation"
- Make clear stance on CBDC, stablecoin, and similar forms of crypto-assets

Roadmap ....

- Strengthen the capacity of NIPS, NCHL, and Non-bank Payment system operators, focusing on data and cyber security
- Strengthen coordination among regulatory institutions for ensuring regulatory coherence
- Deeper collaboration with IMF, BIS, and peer central banks for capacity building, knowledge sharing, and influencing global standards
- Legal reform remains critical –
  - ✓ Financial Sector Development Strategy to visualize digitalization, financial landscape
  - ✓ NRB Act and BAFIA to incorporate CBDC

Conclusion

- Digitization has posed both opportunities and challenges – no choice other than adopting technology
- Central banks, as other regulators, globally have been monitoring digital innovation in banking and payment infrastructure 24/7, and regularly tailoring the activities and regulations
- Traditional channel of monetary policy transmission disrupts with the development of digital system and financial innovation
- As the use of AI/ML and crypto assets have accelerated,
  - Future of traditional banks and financial institutions.
  - Future of current structure of central bank

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Thank You