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## Financial Inclusion through Central Bank Digital Currency (Digital Rupee): A Survey based Empirical Study<sup>1</sup>

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## **Abstract**

In this paper, we develop a model incorporating the impact of digital currency (digital rupee – CBDC) on the financial inclusion to study the implications of introducing CBDC by RBI. CBDCs in developing countries has a wider impact on potential to bank large unbanked populations and boost financial inclusion in conjunction with the JAM Trinity. Agarwal, Agarwal, Agarwal and Agarwal (2018) proposed the introduction of Digital Rupee as CBDC issuance, which can be done by change of mode, instead of minting. The study focuses to study the perception & usefulness of Digital Rupee in India with over 997 respondents from across disciplines, age groups, genders pan India. The general belief is that Digital Rupee introduced as CBDC by RBI will increase overall lending, engulf unbanked population, help credit-building, increase transactional efficiency & reduce ills of crypto-products. The design is optimal for welfare as the gains from greater access to CBDC outweigh the contraction it holds today.

**JEL Code :** E42, E44, E51, E58, G21, G28, L11, L15

Keywords: CBDC; Monetary Policy; Money; Money Supply; Financial

Inclusion; Deposit; Bank; Digital Rupee, RBI, India

## I. Introduction

PEOPLE BARTERED BEFORE using money. The World oldest coin minting sites located in India over 2,000 BCE and in China around 770 BCE. Since then, adoption of banknotes as leather, stone, paper, plastic and now digital forms of payments has come into existence. Often money and currency are used interchangeably. But according to some economists they are not same. Basic form of money in numbers. While the basic form of currency is coins, banknotes, plastic cards, credits, loans, digital transactions etc.

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are essential for digital rupee to successfully deliver its objectives or motivation that guide its introduction. The survey conducted reflected a very enthusiastic support to digitalisation, digital financial inclusion and overall empowerment of the common man. The transformed variables did not offer sufficient explanation or support to the empowerment and financial inclusion dependent variables but gives important insight into the significant variables of digital rupee, financial inclusion, empowerment, competitiveness and economic stability.

## References

Accenture, (2018), "Intelligent blocks of India's future workforce", Report by Accenture, August 6th 2018

ADB, (2018)," Pacific Energy Update 2018" Asian Development Bank, Manila

Adrian, T and T. Mancini Griffoli, (2019), "The Rise of Digital Money" FinTech Notes No. 19/001, International Monetary Fund, Washington DC, USA and *Annual Review of Financial Economics*, Vol. 13

Adrian, T., F. Grinberg, T. Mancini-Griffoli, R. Townsend& N. Zhang, (2022), "The rise of digital money: A strategic plan to continue delivering on the IMF's mandate", IMF WorkingPaper22/217

AFI, (2020),"AFI Members Explore Central Bank Digital Currency Opportunities", AFI Global, 16 November 2020

Agarwal, Aman, (2017a), "Interjection on Bank Depository Insurance Act & BITCOINs" at 2018-19 Pre-Budget Seminar at IHC Delhi, India with Dr. Rajiv Kumar (Vice-Chairman, Niti Aayog) and Dr. Arun Maira (Former Member, Planning Commission of India & Former Chairman BCG India) at Pahle India Foundation (PIF) on December 19th, 2017 at 11 am (https://youtu.be/88oLG1fKXmo)

Agarwal, Aman, (2018a), "Crypto Currency impacting Global Financial System" discussion with Prof. Joseph Stglitz (Nobel Laureate & Professor Columbia University) after his address at India Economic Conclave 2018 at Taj Palace Diplomat Hotel, Delhi at 10:55 am

Agarwal, Aman, (2018b), "BITCOINS, Crypto Currencies & Global Financial Markets Crash", *Delhi Doordarshan TV (DD India TV)*, March 11<sup>th</sup>, 2018 at 6:00 PM

Agarwal, Aman, (2018c), "Comments & question on BITCOINs & Crypto Currency" to Don Tapscott (CEO Capacity Go & Executive Director, Blockchain Research Institute, USA) at India Economic Conclave 2018 at Taj Palace Diplomat Hotel, Delhi at 3:15 pm (https://youtu.be/UUNNQKc4bvU)

Agarwal, Aman, (2018d), "World Financial Markets & Crypto Currencies", Delhi Doordarshan TV (DD India TV), February 18<sup>th</sup>, 2018 at 6:00 PM and Delhi Doordarshan TV (DD News TV), February 19<sup>th</sup>, 2018 at 10:00 am (youtu.be/aDiLdT2-Kug)

Agarwal, Aman; Jack HW Penm and Saurabh Agarwal, (2006), "Common Currency for India and the ASEAN Region: An Empirical Investigation", Working Paper, Indian Institute of Finance, December 2016

Agarwal, Aman; JHW Penm; Wing-Keung Wong and Lynn M Martin, (2004), "ASEAN DOLLAR: A Common currency establishment for stronger economic growth of ASEAN Region" *Finance India*, Vol XVIII, Special Issue 2004.

Agarwal, J. D., Manju Agarwal, Aman Agarwal and Yamini Agarwal, (2020), "Economics of Cryptocurrencies: Artificial Intelligence, Blockchain, and Digital Currency," World Scientific Book Chapters, in: NYU Stern School of Business, Prof. Bala Kashi R Balachandran (ed.), Information for Efficient Decision Making Big Data, Blockchain and Relevance, chapter 13, pages 331-430, World Scientific Publishing Co. Pte. Ltd..

- Agarwal, J.D. and Aman Agarwal (2008), "Money Laundering: The Real Estate Bubble", *Finance India*, Vol 22 No 1, March 2008. Invited to deliver the address to the AFFI (French Finance Association) Annual Meeting June 2007 on Finance, Ethics and Governance organized by the University of Bordeaux IV, Bordeaux and AFFI, (France) at the Annual Meeting International Conference in Bordeaux, FRANCE (June 27-29th, 2007).
- Agarwal, J.D. and Aman Agarwal (2004a), "India AML Progress Analyzed" USA Patriot Act Monitor, August 2004
- Agarwal, J.D. and Aman Agarwal, (2004b), "International Money Laundering in the Banking Sector", *Finance India*, Vol XVIII No 2, June 2004; Reprinted with permission in *The ICFAI Journal of Banking Law*, Vol. II No. 4, October 2004, the journal of ICFAI University, Hyderabad. Invited to deliver as the Keynote Address at the Asia Pacific Bankers Congress 2004 in Manila, PHILIPPINES on 26th March 2003. (25-26th March 2004). Covered widely by over 300 International Press (TV & Newspapers including leading newspapers in India).
- Agarwal, J.D. and Aman Agarwal, (2005), "Inflation, Savings and Financial Development", Finance India, Vol XIX No 2, June 2005
- Agarwal, J.D. and Aman Agarwal, (2006), "Money Laundering: New Forms of Crime Victimization (Current Trends and Modus Operandi)", Finance India, Vol. 19 No 4, December 2006. Keynote address delivered at the National Workshop on New Forms of Crime Victimization with reference to Money Laundering, organized by the Indian Society of Victimology, Department of Criminology, University of Madras, Chepauk, Chennai, INDIA, on 18th November 2006 to senior officials from the government, judiciary, intelligence and enforcement agencies in India and outside.
- Agarwal, J.D. and Aman Agarwal, (2017, 2018), "Niti Aayog's India: Three Year Action Agenda 2017-18 to 2019-20: Review and Analysis", Finance India, Vol 31, No 3, September 2017, pp. 905-928 and AESTIMATIO, The EIB International Journal of Finance, Vol 16, pp 2-23 DOI: 10.560/IEB.18.7, February 2018
- Agarwal, J.D. and Yamini Agarwal, (2017), "Analysis of Union Budget 2017", Finance India, Vol. XXXI No. 1, March 2017
- Agarwal, J.D., (1969, 1988a), "Capital Budgeting Decision under Risk and Uncertainty", IIF Publications, Delhi, India, 1988; Doctoral Thesis Work done at Delhi School of Economics, The University of Delhi, Delhi 1969.
- Agarwal, J.D., (1980), "Ordinal Ranking of Objective: A Conceptual Framework", *The Management and Labour Studies*, The Journal of Xavier Institute, Jamshedpur, Vol 6, No 2, December 1980, pp. 85-96.
- Agarwal, J.D., (1991), "Black Money: Some Dimensions", Finance India, Vol. V, No. 1, March 1991. pp. 55-60.
- Agarwal, J.D., (2004), "Volatility of International Financial Markets, Regulation and Financial Supervision", *Finance India*, Vol XVIII No 1, March 2004; delivered as invited Opening Keynote address at IVth International Finance Conference hosted by University of Santiago de Chile, Chile (January 7th, 2004). Covered widely in International press including North America.

Agarwal, J.D., (2007), "Modelling and Analysis of Safety and Risk in Complex Systems", *Finance India*, Vol XXI No 3, September 2007; delivered as invited as Opening Keynote Address at 7th International Scientific School Conference of Russian Academy of Sciences at RAS Saint Petersburg, Russia. 4-8th September 2007.

Agarwal, J.D., (2008), Evgeny Solojentsev and Aman Agarwal (2008), "Logic and Probabilistic Risk Models of Bribes" *Finance India*, Vol XXII No 3, September 2008

Agarwal, J.D., (2017aa), "Sustainable Growth, Innovation and Revolution in the new Millennium" delivered as invited Chief Guest Keynote Address at 20th International Conference hosted by Research Development Association and Rajasthan Chamber of Commerce & Industry at Hotel Clarks Amer, Jaipur on March 25th, 2017.

Agarwal, J.D., (2017ab),"Innovation, Disruption and Transformation in Financial Markets", delivered as invited Keynote Address at ICFAI Business School (IBS) Mumbai on 7th April 2017.

Agarwal, J.D., (2018aa), "Analysis of Union Budget 2018", Finance India, Vol. XXXII No. 1, March 2018

Agarwal, J.D., Aman Agarwal and Yamini Agarwal, (2017), "GST Impact on the Indian Economy, Supply Chain and Financial Inclusion" at Bureau of Indian Standards (BIS), Delhi on 30th August 2017 as an invited Guest of Honour Valedictory Address at the BIS Conference on "Risk Management in Supply Chain" Earlier Interviewed on All India Radio (AIR); Lok Sabha TV, Delhi Doordarshan (DD) and in many Newspapers/Magazines multiple times since beginning of 2016.

Agarwal, J.D., Manju Agarwal and Aman Agarwal, (2016, 2017), "Financial Inclusion, Banking and Digital Dividends", delivered as invited Guest of Honour Keynote Address at Digital Wallet Summit 2017 in Bangalore, India on June 16th, 2017 and Guest of Honour Valedictory Address at "Digital Dividends" at International Conference on Technoviti – Futurecrafting Business with Technoruptions at ITC Grand Maratha, Mumbai, INDIA (February 5th, 2016)

Agarwal, J.D.; Manju Agarwal; Aman Agarwal; Yamini Agarwal, (2018), "The Theory of Money, Wealth and Efficient Currency Market: Modeling M5 as Money Supply with Crypto-Currency", Finance India, Vol 32, No 2, June 2018 (http://financeindia.org/data/2018/FI322/FI-322-Art01.pdf)

Agarwal, Manju and Saurabh Agarwal, (2007) "Economics of Public Utilities in market Driven Economic Systems", Finance India, Vol. XXI, No 3, September 2007

Agarwal, Manju, (1988), "Tax Incentives and Investment Behaviour", IIF Publication, Delhi, 1988.

Agarwal, Yamini, (2010), "Capital Structure Decisions under Multiple Objectives: Study of Indian Corporates", Finance India, INDIA, Vol. 24 No. 2, June 2010,pp. 515-523

Agarwal, Yamini, (2013a), "Capital Structure Decisions: Evaluating Risk and Uncertainty" John Wiley & Sons, USA (Wiley USA, UK & Singapore)

Agarwal, Yamini, K.C. Iyer and Surendra S. Yadav, (2009), "Capital Structure Decision: A Behavioral Study on Multiple objectives framework", *Finance India*, Vol. 23, No. 2, June, 2009, pp 431-468.

Agarwal, Yamini, K.C. Iyer and Surendra S. Yadav, (2012) "Multi-objective Capital Structure Modeling: An Empirical Investigation of Goal Programming Model Using Accounting Proxies", *Journal of Accounting, Auditing and Finance*, Vol. 27, No.3, July 2012, pp. 359-385.

Agarwal, Yamini, (2013b), "Capital Structure Decisions under Multiple Objectives : A Study of Indian Corporates", IIF Publication, Delhi, 2013

- Agur, I., A. Ari, and G. Dell'Ariccia, (2022), "Designing Central Bank Digital Currencies", Journal of Monetary Economics, Vol. 125, pp. 62–79
- Ahnert, T., P. Hoffmann, and C. Monnet, (2022), "The digital economy, privacy, and CBDC" Working Paper Series No 2662, European Central Bank, May 2022
- Ali, R; J. Barrdear; R. Clews and J. Southgate, (2014), "Innovations in payment technologies and the emergence of digital currencies", *Bank of England Quarterly Bulletin*, Vol. 54, No. 3, pp 262–75
- Andolfatto, D., (2018), "Assessing the impact of central bank digital currency on private banks" Working Paper 2018-25, Federal Reserve Bank of St. Louis, USA.
- Andolfatto, D., (2021), "Assessing the impact of central bank digital currency on private banks", *The Economic Journal*, Vol. 131
- Archana, Alekh, (2018), "RBI Cracks down on Bitcoins", *Hindustan Times*, April 6<sup>th</sup>, 2018
- Auer, R., and R. Böhme, (2020), "The technology of retail central bank digital currency", Working Paper, Bank for International Settlements, March 2020
- Auer, R., G. Cornelli and J. Frost, (2020), "Covid-19, Cashandthe Futureof Payments", BIS Bulletin, Vol. 25
- Barrdear, J. and M. Kumhof, (2016), "The macroeconomics of central bank issued digital currencies", BOE Staff Working Paper No. 605, Bank of England, UK
- Bech, Morten, and Rodney Garratt, (2017),"Central Bank Cryptocurrencies", BIS Quarterly Review, Basel
- Beck, T, (2018), "What's new in the financial inclusion literature?" *VOXEU Blog/Review*, 2 May 2018
- Bernanke, Ben S., (2016), "What did you do in the currency war, Daddy?", Working Paper Brookings Institute, Washington DC, USA, January 5, 2016
- Biago, Bossone, (2022)," CBDC and financial inclusion: Changing the paradigm (Part 1)", The World Bank Publication, 2022
- BIS, (2018), "Central bank digital currencies" Technical report, Committee on Payments and Market Infrastructures, Markets Committee, Bank for International Settlements, Switzerland.
- BIS, (2020a), "Central Bank Digital Currencies: Foundational Principles and Core Features", Report No 1, Bank for International Settlements, Basel
- BIS, (2020b)," BIS Quarterly Review: International Banking and Financial Market Developments", Bank for International Settlements Basel.
- BIS, (2020c),"Enhancing Cross-Border Payments: Building Blocks of a Global Roadmap", Bank for International Settlements, Basel
- BIS, (2022), "CBDCs in emerging market economies," BIS Papers No 123, Bank for International Settlements, April 2022
- BIS-FSB, (2020a)," Enhancing Cross-border Payments: Stage 1 Report to the G20" Bank for International Settlements, Basel.
- BIS-FSB, (2020b)," Enhancing Cross-border Payments: Stage 3 Roadmap", Financial Stability Board, Basel.

Boar, Codruta, Henry Holden, and Amber Wadsworth, (2020),"Impending Arrival – A Sequel to the Survey on Central Bank Digital Currency", BIS paper No 107. Bank for International Settlements, Basel

Brunnermeier, Markus K., Harold James & Jean-Pierre Landau, (2019), "The Digitalization of Money", Working Paper #26300, National Bureau of Economic Research (NBEF), USA, September 2019

Carapella, F. and J. Flemming, (2020), "Central bank digital currency: A literature Review", FEDS Notes 2020-11-09. Board of Governors of the Federal Reserve System, Washington DC, 9th November 2020

Cenfri, (2019),"The Use Cases of Central Bank Digital Currency for Financial Inclusion: A Case for Mobile Money, Tyger Valley, South Africa", CENFRI,

Chang, H., L. Gornicka, F. Grinberg, M. Miccoli, and B. Tan, (2023), "CBDC and banking disintermediation in a portfolio choice model", IMF Working Paper, International Monetary Fund, Washington DC, USA 17th March 2023

Chapman, James, Rodney Garratt, Scott Hendry, Andrew McCormack, and Wade McMahon, (2017), "Project Jasper: Are Distributed Wholesale Payment Systems Feasible Yet?" Bank of Canada Financial System Review, June 2017

Chiu, J., M. Davoodalhosseini, J. Jiang, and Y. Zhu, (2022), "Bank market power and central bank digital currency: Theory and quantitative assessment", *Journal of Political Economy*, Vol 131, No 5, May 2023

Copernicus, Nicolaus, (1517), "Memorandum on monetary policy", Poland

Corea, Francesco, (2017), "Unsupervised Investments: A comprehensive Guide to AI Investors Decisions" Scientist and Data strategist by KD Nuggts, March 2017

CPMI-World Bank, (2016), "Payment Aspects of Financial Inclusion", report by the Committee on Payments and Market Infrastructures (CPMI) and World Bank Group, April 2016

Davidovic, Sonja, Elena Loukoianova, Cormac Sullivan, and Hervé Tourpe, (2019), "Strategy for Fintech Applications in the Pacific Island Countries", IMF report No. 19/14, International Monetary Fund, Washington DC, USA

Demirguc-Kunt, A., L. Klapper, and D. Singer, (2017), "Financial inclusion and inclusive growth: A review of recent empirical evidence" Working Paper No 8040, The World Bank, Washington DC, USA

Dickey, Lauren, Erica Downs, Andrew Taffer, and Heidi Holz with Drew Thompson, S. Bilal Hyder, Ryan Loomis, and Anthony Miller, (2019), "Mapping the Information Environment in the Pacific Island Countries: Disruptors, Deficits, and Decisions", CNA report, 2019

Didenko, Anton N. and Ross P. Buckley (2021), "CBDC A potential response to financial inclusion challenges of the Pacific", Issue in Pacific Development, ADB, No. 3, August 2021

Didenko, Anton N., (2020), "Cybersecurity Regulation in the Financial Sector: Prospects of Legal Harmonization in the European Union and Beyond", *Uniform Law Review*, Vol 25, No. 1, pp. 1-25

Didenko, Anton N., and Ross P. Buckley, (2019),"The Evolution of Currency: Cash to Cryptos to Sovereign Digital Currencies", Fordham International Law Journal, Vol. 42, No. 4, pp 10-41

EBA, (2014), "EBA opinion on 'virtual currencies", EBA/Op/2014/08, European Banking Authority

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ECB, (2012), "Virtual Currency Scheme" European Central Bank, October 2012 ECB, (2020), "Report on a digital EURO", European Central Bank

Fisher, Irving, (1911), "The Purchasing Power of Money", MacMillan Company

Friedman, Milton and Anna J. Schwartz, (1965), "The Great Contraction 1929–1933", Princeton University Press, Princeton

Friedman, Milton, (1956), "The Quantity Theory of Money: A Restatement" in *Studies in the Quantity Theory of Money* and reprinted as "*The Optimum Quantity of Money*", Vol 51, pp. 67

Friedman, Milton, (1958), "Essays in Positive Economics", The University of Chicago Press, USA

Friedman, Milton, (1959), "A program for monetary stability", Fordham University Press, New York

Friedman, Milton, (1969), "The optimum quantity of money, in the optimum quantity of money and other essays", Aldine, Chicago, pp. 1-50.

Friedman, Milton, (1970) "The Counter-Revolution in Monetary Theory", IEA Occasional Paper, No. 33 Institute of Economic Affairs, London, 1970.

Friedman, Milton, (1987), "Quantity theory of money", The New Palgrave: A Dictionary of Economics, Vol. 4, p. 15.

Froyen, Richard T., (1990), "Macroeconomics: Theories and Policies", 3rd Edition, Macmillan Publishing Company, New York, pp. 71

Furness III, William Henry, (1910), "The Island Of Stone Money UAP Of The Carolines" J. B. Lippincott Company

Gjefle, E, Z Herring, C Kubli, B O'Rea and G Rakusen, (2021), "Centering users in the design of digital currency, The future of our money", MIT Digital Currency Institute and Maiden Labs, MIT, USA

Haig, Samuel, (2020), "Survey: Consumers Trust CBDCs over Privately-Issued Crypto Assets", Cointelegraph, 20 April 2020

Hayek, F, (1976), "Denationalisation of Money", Institute of Economic Affairs, London

He, Dong; Karl Habermeier; Ross Leckow; Vikram Haksar; Yasmin Almeida; Mikari Kashima; Nadim Kyriakos-Saad; Hiroko Oura; Tahsin Saadi Sedik; Natalia Stetsenko and Concepcion Verdugo-Yepes, (2012), "Virtual Currencies and Beyond: Initial Considerations", IMF Discussion Note, International Monetary Fund, January 2016, pp. 1-42

HT Correspondent, (1997), "Capital Flight to US due to abnormal trade : IIF Study",  $Hindustan\ Times$ , January 20th, 1997

HT, (2018), "Now, bitcoin is used for foreign money transfer",  $\it Hindustan\ Times$ , April 6<sup>th</sup>, 2018

Hume, David,(1748), "Of Interest" in Essays Moral and Political

IMF, (2018),"The Bali Fintech Agenda- Background Paper", Policy Report, International Monetary Fund, Washington, DC.

IMF, (2021), "The rise of digital money: A strategic plan to continue delivering on the IMF's mandate" IMF Policy Paper, International Monetary Fund, USA

Infante, S., K. Kim, A. Orlik, A. Silva, and R. Tetlow, (2022), "The macroeconomic implications of CBDC: A review of the literature", Federal Reserve Board, Finance and Economics Discussion Series, USA

Jaitley, Arun, (2018), "Union Budget 2018-19", Finance India, Vol 32, No 1, March 2018

Javed, Aisha, (2017), "Digital Evolution Report- cyber- crime, Digitalization, Blockchain and AI", December 25th, 2017

Kebede, J, A Naranpanawa, and S Selvanathan (2020), "Financial inclusion: Measure, and nexus with bank market structure in Africa," Discussion Paper Series 2020-04, Griffith Business School, Griffith University, Queensland, Australia, April 2020

Keister, T. and D. R. Sanches, (2019), "Should central banks issue digital currency?" Technical report, The University of Chicago, USA

Keister, T. and D. Sanches, (2023), "Should central banks issue digital currency?", The Review of Economic Studies, Vol. 90, No. 1, January 2023,

Kumar, Prabhat, (2019), "Artificial Intelligence (AI): Reshaping Life and Business "BPB Publication, India

Mill, John Stuart, (1848), "Principles of Political Economy", London

Minsky, Hyman P., (2008), "John Maynard Keynes" McGraw-Hill. 2008.

Mishkin, Frederic S., (1998), "The Economics of Money, Banking and Financial Markets", 5<sup>th</sup> Edition, Addison-Wesley Longman Inc., USA

Newcomb, Simon, (1885), "Principles of Political Economy", New York

NITI Aayog (2018), "National Strategy for AI", Niti Ayog, India 2018

Norges Bank, (2019), "Central bank digital currencies", Norges Bank

Orcutt, Mike, (2019), "China says its digital currency will have "controllable anonymity" – but who will control it?", MIT Technology Review, Blockchain, November 13th, 2019

Osborne, G., (2014), "Chancellor on developing FinTech", Government of UK

Pandya, Jayshree, (2019), "Forbes publishes the Risk Roundup discussion with IIF Prof Aman Agarwal of Indian Institute of Finance (www.iif.edu) by Dr. Jayshree Pandya on AADHAR as featured article on "Nuances Of AADHAR: INDIA's Digital Identity, Identification System And ID" Forbes, USA July 16th, 2019

Piazzesi, M. and M. Schneider, (2020), "Creditlines, bank deposits or CBDC? Competition efficiency in modern payment systems", Working Paper, Stanford University, USA, June 2020

Powell, Burgess, (2018), "Venezuela Makes Petro Cryptocurrency A National Currency",  $Block\ LR$ ,

Sas, Corina and Irni Eliana Khairuddin, (2017), "Design for Trust: An Exploration of the Challenges and Opportunities of Bitcoins Users", Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems, Chapter 17, pp 6499-6510

Satoshi, Nakamoto; (2008), "Bitcoin: A Peer-to-Peer Electronic Cash System" https://bitcoin.org/bitcoin.pdf

Schou-Zibell, Lotte, and Nigel Phair, (2020)," COVID-19 has Created Digital Opportunities in the Pacific", Asian Development Bank Blog, 6 July 2020

Shetty, Mayur and Shalina Pillai, (2018), "RBI bars banks from crypto services, plans e-currency", *Times of India*, April  $6^{\rm th}$ , 2018

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Soderberg, G., M. Bechara, W. Bossu, N.X. Che, J. Kiff, I. Lukonga, T.M. Griffoli, T. Sun, and A. Yoshinaga, (2022), "Behind the scenes of central bank digital currency: Emerging trends, insights, and policy lessons" FinTech Notes, 2022

Stemberg, Robert J., (1982), "Handbook of human intelligence" , Cambridge University Press

Tan, Brandon Joel, (2023), "Central Bank Digital Currency and Financial Inclusion", IMF Working Paper WP/23/69, Monetary and Capital Markets, 2023.

Tobin, J., (1985), "Financial innovation and deregulation in perspective", Bank of Japan Monetary and Economic Studies, Vol 3 No. 2, pp. 19-29

TOI Bureau, (1997), "IIF Study Estimates US\$ 4-11 bn Capital Flight from India to US in 1994-95", Times of India, January 20th, 1997

WEF, (2022), "The Digital Economy, 4 ways to ensure Central Bank Digital Currencies promote financial inclusion", The World Economic Forum, 2022

White, Lawrence. (2018),"The World's First Central Bank Electronic Money Has Come-And Gone: Ecuador, 2014-2018", CATO Institute Blog, 2 April2018

Williamson, S., (2019), "Central bank digital currency: Welfare and policy implications", Technical report, The University of Chicago, USA

World Bank, (2022), "Mobile Cellular Subscriptions (Per 100 People)", International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database, The World Bank, Washington DC

Yermack, D, (2013), "Is Bitcoin a real currency? An economic appraisal", NBER Working Paper No. 19747

Yeung, Karen, (2020),"What is China's Cryptocurrency Alternative Sovereign Digital Currency and Shy Is it Not Like Bitcoin?", South China Morning Post, 13 May 2020

Zdanowicz, John S., William W Welch and Simon J Pak, (1995), "Capital Flight from India to US through Abnormal Pricing in International Trade", Finance India, Vol IX No 3, September 1995

Zdanowicz, John S., William W Welch and Simon J Pak, (1996), "Capital Flight from India to US through Abnormal Pricing in International Trade", Finance India, Vol X No 4, December 1996

Zoumboulis, Nicolas, (2020), "COVID-19 Leads to Huge Growth in Digital Money Transfers to Pacific but Concerns Remains over High Fees" ABC Pacific News,5<sup>th</sup> October 2020