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Digital National Currency: Example of Sweden and e-Krona

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Abstract

Financial Institutions all around the world are recently discussing possibilities to launch national digital currencies to replace the cash as we know it since the Lydians invention. In this paper, we review the concept by visiting the core definitions and focus on the Scandinavian market to understand the example of Sweden and the ongoing e-Krona project. We conclude by pointing out some research questions and call upon developing future collaborative research.

Keywords: *digital national currency, central bank digital currency (CBDC), e-Krona, Sweden, Scandinavia*

1. Introduction

This paper is based on work-in-progress research, which aims to provide an introduction to the Digital National Currency concept to nurture future research efforts. Following definition of concepts, it lays the ground by taking the example of Scandinavian consumers with particularly the focusing on Sweden and the on-going e-Krona project – a Central Bank Digital Currency by the Sveriges Riksbank. It concludes by raising research questions and calls upon future research directions and collaborations.

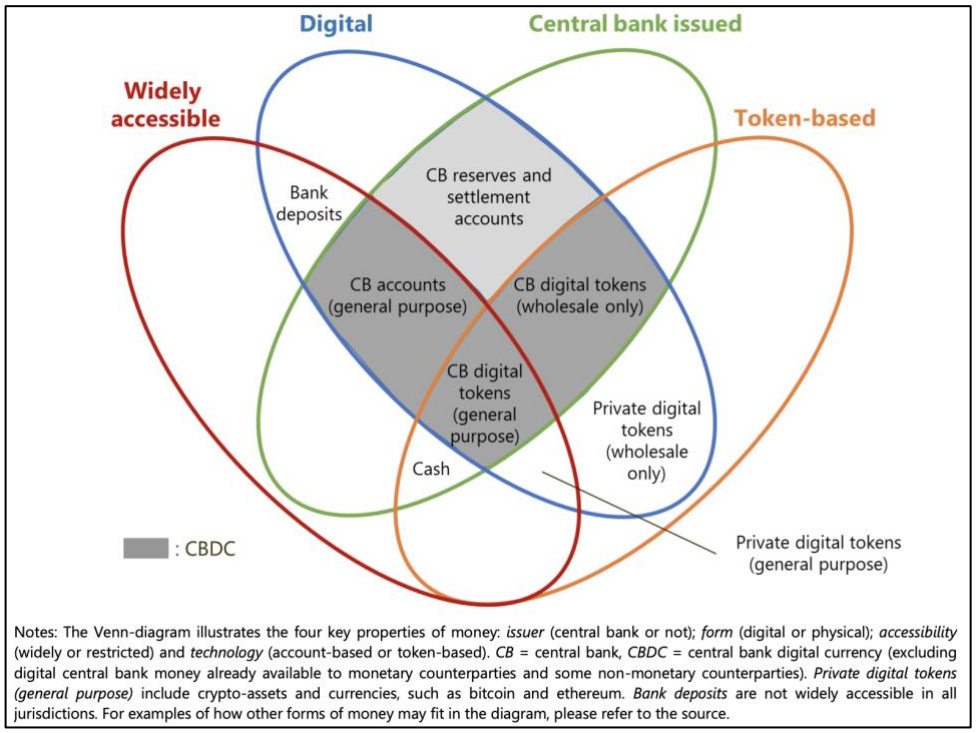
2. Digital National Currency: Swedish example

2.1. Central Bank Digital Currency (CBDC)

Digital currencies, also known as digital money, cybercash, e-cash, or cryptocurrency, have been around for a while. As they provide payment methods only available in electronic form,

they are not tangible in the sense that the well-established money that dates back in history. Digital currencies are widely used to purchase goods and services, while some could be restricted to specific online communities (e.g., gaming, social media). They can be transferred easily between entities as well as users, and mainly provide advantageous in allowing the borderless transfer of ownership as well as instantaneous transactions. In addition, digital currencies involve high levels of volatility in comparison to core currencies, which rise speculative buy-sell demand with the focus of saving and investment.

One rather recent development in the field of digital currencies is the central bank digital currency (CBDC), which is also called "Digital Fiat Currency" or "digital base money." According to the money flower developed by BIS (2018) based on Bech and Garratt (2017), CBDC promises a wide range of opportunities. Also, CBDC might allow individuals to hold liability in a central bank instead of commercial banks; reduce costs and enable financial inclusion, particularly in emerging markets and lower-income countries; and help satisfy expenses of maintaining a payments system (IMF, 2019). Uruguay, Sweden, China, Ukraine, and Eastern Carribean Central Bank are listed as the notable central banks around the world, either exploring or piloting a central bank digital currency (IMF, 2019). In this regard, focusing on the Sweden example provides exciting findings that could be useful for other parts of the world.



Notes: The Venn-diagram illustrates the four key properties of money: *issuer* (central bank or not); *form* (digital or physical); *accessibility* (widely or restricted) and *technology* (account-based or token-based). *CB* = central bank, *CBDC* = central bank digital currency (excluding digital central bank money already available to monetary counterparties and some non-monetary counterparties). *Private digital tokens (general purpose)* include crypto-assets and currencies, such as bitcoin and ethereum. *Bank deposits* are not widely accessible in all jurisdictions. For examples of how other forms of money may fit in the diagram, please refer to the source.

Fig. 1 The money flower: a taxonomy of money (BIS, 2018, p. 5)

2.2. Scandivian consumers' digital habits

Scandinavian countries have lately been witnessing decreasing numbers of cash withdrawals and cashless transactions per capita. Recent reports indicate that cash withdrawals from ATM per capita per year are around ten while the number of cashless transaction per capita per year is approximately 500-600 in Sweden, Denmark and Norway (Deloitte, 2019). Among these three countries, cash as a percentage of GDP is lowest in Sweden at about 1% (Bitcoin.se, 2019). Online banking is prevalent in all Nordic countries, which involves Denmark, Finland, Norway, and Sweden in alphabetical order (BoF, 2019c), while many Nordic banks are considered rather cost-efficient (BoF, 2019a). In addition to the well established digital banking, widely popular mobile broadband use (BoF, 2019b) also facilitates high numbers of mobile in-store and domestic P2P payments (Deloitte, 2019) in the Nordic countries.

As of 2017, reports indicate that 60% of Nordic residents who made online purchases of a total of EUR 21.7 billion were aged between 18 and 79 (PostNord, 2019). According to the

same report, the percentage of the population with Internet access was 95% in Sweden and 97% in Denmark, Norway, and Finland in the year 2015. The portion of the population shopping online and the average estimated value of online shopping per person in Sweden, Denmark, Norway, and Finland were 66% - EUR200, 61% - EUR229, 63% - EUR220, and 46% - EUR156, respectively (PostNord, 2019). Nordic consumers have carried out an average of 36 online purchases of physical products via their cell phones during a 30-day window (PostNord, 2019).

2.3. Cashless society in Sweden

Sweden is a Scandinavian country in northern Europe. It has the third-largest area in the European Union, a population of about 10 million, and has a GDP of USD52,766 per capita (OECD, 2019). The Swedish economy is built on engineering, telecommunications, automotive and pharmaceutical industries. Since the Swedish government set the goal that "Sweden should become the best in the world exploiting the opportunities of digitization" (Jacobsen, 2016), it has established a well developed IT-sector and hosts as many tech startups as Silicon Valley (Coleman, 2015).

Ranking 2nd on the Digital Economy and Society Index (EC, 2019), Swedes tend to adopt the benefits of technology rather swiftly. According to Riksbank (2018a) reports, there is a tendency to prefer other means of payment over cash in purchases. Over the course of eight years, a decline from 40 to 13 per cent was observed in paying in cash (Riksbank, 2018a, p. 5). Moreover, technological novelties are embraced rather quickly as seen in the example of thousands getting microchips implanted under their skin to replace their credit card information, identification, keys, train tickets, and other everyday items (Brown, 2019; Durden, 2018).

As pointed by Gnan and Masciandaro (2018), the use of paper cash is quickly dwindling, the general public in Sweden is expected to no longer have access to the central bank money, Krona. Along the same lines, the retail payments developments also indicate that there will be no longer a domestic infrastructure for retail payments, particularly given the dominance of global card schemes. In this regard, e-krona provides a promising opportunity for (1) ensuring that the Swedish public has access to central bank money; (2) providing a payment infrastructure with a potential to improve payment system resilience; and (3) providing a means of payment primarily between households and firms as it would be accessible 24/7 to process payments in real time.

2.3.1. E-krona

Acknowledging the decline in cash use in Sweden, Riksbank "*initiated a pilot programme to develop one or more possible technical solutions for a comprehensive e-krona concept* (Riksbank, 2018b)." Predictions include further marginalised cash, hence it is feared that using cash would pose difficult as a payment mean. E-krona is being investigated as stateguaranteed means of payment alternative of the future. It is argued that such would ensure that general public would not entirely be left dependent on private payment solutions. In this regard, a review of the concept of legal tender is proposed recently (Riksbank, 2019).

3. Discussion and Conclusion

As the central banks around the world embrace the swift technological developments, neither markets, nor companies, and not even consumers seem to be researched in their readiness to adapt to the changes that the future holds. It is already being discussed whether there could be any disadvantages in terms of being left behind for the elderly and those who struggle with technology (DailySweden, 2019). The possible effects of the existing Internet and communications infrastructure, current level of digital adoption (e.g., use of Internet), use of cash, access points to the financial system, and availability of technologically neutral and secure methods of payment might be listed among some factors to consider (BBVA, 2018). In addition, changes to the supply chain due to the merging of information and financial flows could provide essential research questions. Last but not the least, perceived ease of use, usefulness, and risk factors (Folkinshteyn & Lennon, 2016) should be investigated for consumers, firms, banks, and regulators to better understand the bottlenecks that could be involved in the technology acceptance. Future research, if possible among cross disciplines, is needed to better understand and predict the possible effects of CBDC on various levels.

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