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Using central bank digital currency to achieve the sustainable development goals

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Abstract

This paper examines the role of central bank digital currency (CBDC) in achieving the United Nations sustainable development goals (SDGs). It was argued that a central bank digital currency can unlock financing for each of the sustainable development goals, provide suitable access to capital and increase payment efficiency. CBDC can also increase the speed of transaction chains and provide greater capital efficiency for investment in sustainable development activities and projects.

Keywords: central bank digital currency, CBDC, sustainable development, sustainable development goals, United Nations, SDGs

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1. Introduction

The purpose of this paper is to examine how a central bank digital currency can be used to achieve the sustainable development goals. This topic is important to policymakers who are interested in how central bank innovation can help to support the realization of the sustainable development goals. This study is also relevant to researchers conducting research on how a central bank digital currency can be used to achieve the realization of the sustainable development goals.

Several innovations have emerged that contribute to achieving the sustainable development goals. Some of these innovations include digital financial services, Fintech, and private digital currencies (Deng et al, 2019, Ozili, 2018; Piliyanti, 2019; Ozili, 2021). In the literature, a number of studies have examined how financial innovations can help to achieve the sustainable development goals (e.g. Vollenbroek, 2002; Silvestre and Țîrcă, 2019; Hall and Vredenburg, 2003). These studies show that, with the right pre-conditions in place, digital financial innovation can support the realization of the sustainable development goals.

Digitalization is transforming the sustainable development landscape and there is a need for central banks to play a major role in digital transformation for sustainable development. A notable central bank digital innovation is the central bank digital currency or CBDC. CBDC is the digital equivalent of cash or paper money and is a liability of the issuing central bank (Bordo and Levin, 2017; Kiff et al, 2020; Engert and Fung, 2017; Ozili, 2022a). A central bank digital currency is money or currency in digital form (Ozili, 2022). Interest in CBDC is growing rapidly among policymakers and central banks. CBDC and sustainable development are two important issues in modern academic and policy discourse. The potential role of a CBDC in supporting the realization of the sustainable development goals is that the CBDC is a payment tool that can be used to channel payments to sustainable development activities and projects, and the CBDC has to be designed in a way that ensures that financing decisions take greater account of sustainable development concerns. CBDC can also change the way people donate to the sustainable development activities and projects they care about.

Despite the growing interest in central bank digital currency, there has been no attempt to assess how a central bank digital currency can contribute to the realization of the United Nations sustainable development goals. To date, the literature has not examined the opportunities that central bank digital currency present for achieving the sustainable development goals. Therefore, this paper discusses how central bank digital currency can help to support the realization of the sustainable development goals. In this paper, CBDC is suggested to be a way to achieve the Sustainable Development Goals (SDGs).

This study contributes to the literature in the following ways. First, the study contributes to existing studies in the literature that assess the determinants of sustainable development. Studies in this literature include Esquivel and Sweetman (2016), Sachs et al (2019), Vinuesa et al (2020) and Ozili and Iorember (2023). The present study shows that central bank digital currency can be used to expand financial services and payment services for sustainable development activities and projects. Second, this study contributes to the emerging central bank digital currency literature by showing that CBDC is a potential factor that could help to accelerate the attainment of the sustainable development goals.

The rest of the paper is structured in the following way. Section 2 presents the ways through which a central bank digital currency can achieve the sustainable development goals. Section 3 concludes.

2. Achieving each SDG using central bank digital currency

Below are ways in which a central bank digital currency can be used to support the realization of each of the 17 sustainable development goals.

SDG1 – Using CBDC to ‘eradicate poverty’

A CBDC can be used to eradicate poverty. The first strategy is to use CBDC to bring poor people into the formal financial sector. This strategy, if successful, will increase the level of financial inclusion of poor people. Increasing financial inclusion through CBDC will give poor people access to affordable CBDC-based credit and other basic financial services which they can use to improve their welfare, thereby enabling them to rise above poverty, and achieve the United Nations sustainable development goal of eradicating poverty (Ozili, 2022b). To eradicate poverty in all its form, a CBDC should be designed to incorporate features that increase financial inclusion toward poverty eradication. Specifically, (i) a token-based CBDC or account-based CBDC should be designed in a way that ensures that poor people who do not own a bank account are able to open a CBDC account easily, without any cost and without any burdensome documentation requirement. The CBDC should also be designed to facilitate both online and offline payments so that poor people, who cannot afford the high cost of internet connectivity, can receive and make payments at any time when the need arises; (ii) a CBDC will enable poor people to access a variety of digital financial services, such as formal loans and investment products, whose interest rates and cost have been significantly subsidized by the government for the benefit of poor people. Poor people can take advantage of available CBDC-based loan and the loan can be paid into their CBDC accounts, they can use the loan to improve their welfare by spending on basic consumption, education, healthcare and by saving some funds for emergency purposes, thereby helping them to rise above the poverty line; (iii) the use of CBDC by poor people also enables the

equitable and faster distribution of cash assistance transfers to households and communities included in government social welfare programs.

SDG2 – Using CBDC to achieve ‘zero hunger’

A CBDC can be used to eliminate hunger in several ways. A CBDC can facilitate a more equitable and faster distribution of cash transfers to poor households and communities which can be used to purchase food so that nobody will suffer from hunger. CBDC can also be used to facilitate investment in food banks both in developed and developing countries which ensures that nobody is left hungry. CBDC can also be used to offer subsidized loans to farmers to enable them secure land, equipment, knowledge and other productive inputs that will be used to double the productivity and incomes of small-scale food producers especially, women, indigenous people, family farmers, pastoralists and fishers. This will increase food productivity and also increase farm employment and non-farm employment, thereby reducing hunger in rural areas. CBDC can also be used to pay for world-class knowledge and innovation that promote sustainable food production and resilient agricultural practices that increase food supply to eliminate hunger. CBDC can also be used to facilitate efficient payments in food commodity markets. This will ensure the proper functioning of food commodity markets and their derivatives, and it will eliminate payment-barriers that lead to extreme food price volatility.

SDG3 – Using CBDC to achieve ‘good health and well-being’

CBDC can be used to mobilize funding for research aimed at (i) reducing maternal mortality, (ii) reducing preventable deaths of under-aged children, (iii) fighting communicable diseases, (iv) preventing and treating substance abuse, (v) reducing mortality from non-communicable diseases, (vi) promoting mental health, (vii) increasing research into vaccine development and production, and (viii) increasing access to sexual education and family planning education. CBDC also offers unlimited central bank financing that can be used to increase health financing in countries where traditional monetary systems are ineffective in increasing health financing. A CBDC can lead to substantial increase in health financing especially in developing countries and small island developing States because healthcare practitioners and hospitals will have access to central bank financing which they can use to develop resilient and sustainable healthcare practices that are affordable to everyone.

SDG4 – Using CBDC to achieve ‘quality education’

A CBDC can be used to achieve SDG4 which is to achieve quality education. Innovative CBDC solutions can allow users to pay fees in equal monthly installments, helping them to afford expensive fees and reducing their dependence on expensive personal loans. CBDC can drive cost efficiencies for schools and affordable education financing for students. Schools can use CBDC solutions to help them improve their payment collection and to track payments. They can also use CBDC solutions to apply for and receive loans, and obtain insurance to mitigate risks associated with school infrastructure. CBDC can be used to put affordable education within the reach of students in developing markets. Families can also use CBDC payday loans to finance the tuition costs of their children. CBDC can also offer “buy now, pay later” options to families to pay students’ tuition fees using CBDC.

SDG5 – Using CBDC to achieve ‘gender equality’

There will be more demand for digital financial services by women if central banks put the necessary enablers in place and develop CBDC-based solutions that focus on women. Hopes are high that CBDC solutions can increase access to financial services for women and finally close the gender gap in access to financial services. CBDC can be used to target women as a customer segment. CBDC can provide financial solutions for the female customer segment and give them better financial services that improve women employment outcomes, wealth accumulation, and their propensity to start a business. CBDC solutions can increase access to microcredit for female-owned micro, small and medium enterprises. It can give women access to microcredit which they can use to increase household consumption expenditures, income-generating activities, and children’s school attendance. When such microcredit is paid into the CBDC account of women, their male head will no longer have easy access to it, thereby giving women control of their finances, and closing the gender gap in access to essential financial services. Central banks, in partnership with the Fintech industry, can develop other CBDC-based solutions that close the gender gap by giving women easy and affordable access to a variety of financial services that improve women’s financial resilience and household decision making which increases their control over money, thereby closing the gender gap. CBDC alone may not close the gender gap in access to financial services. Notwithstanding, the CBDC revolution may need the support of targeted policy initiatives that ease the financial access constraints faced by women. CBDC solutions can also change the way financial products and services are marketed and packaged for women.

SDG6 – Using CBDC to achieve the goal of ‘clean water and sanitation for all’

CBDC solutions can assist in ensuring that everyone on the planet has access to clean water and sanitation. Examples of innovative CBDC solutions that can be used to finance clean water and sanitation activities and projects includes CBDC-based grants, micro-financing, sovereign bonds, crowd-investing using CBDC platform, carbon credit schemes or debt swaps. CBDC solutions can also be used to boost investment in water infrastructure, clean drinking water, water conservation and sanitation. CBDC innovative instruments can also be used to invest in the adequate provision of sanitation facilities, the promotion of hygiene at all levels and protection of water-related ecosystems to prevent water scarcity. CBDC-based financing instruments can be used to raise donations, loans and equity investment in companies that create products related to water conservation, tap water filter and water purification for individuals and industry. This will ensure greater provision and access to clean water especially in developing countries. CBDC solutions can also be used to support water conservation efforts to promote the sustainable use of water sources. CBDC-based financing instruments can be used to issue donations, loans and equity investment in infrastructure companies that help to distribute and improve public water systems. CBDC-based financing instruments can also be used to invest in companies that produce equipment used to produce water such as pipes, pumps, vulvas and filters. Investing in these companies involved in clean water conservation allows them to improve their systems, reduce the imbalance between water supply and demand, and improve water sanitation.

SDG7 – Using CBDC to achieve ‘affordable and clean energy’

Innovative CBDC solutions offer new ways for citizens to get involved in clean energy projects, and to reap the benefits of the production and distribution of clean energy. CBDC offers great potential to facilitate investment in technologies that promote the development of clean and affordable energy. CBDC also create new opportunities for innovative financing options in green bond markets, making it cheaper and easier to finance smaller scale energy efficiency and clean energy projects. Innovative CBDC solutions can accelerate the energy transition through innovations such as CBDC-based green bonds, CBDC payment solutions, and CBDC micro-loans to clean energy producers and consumers. CBDC can also increase efficiency in financing clean energy projects. CBDC-based financing instruments can also be used to raise donations, loans and equity investments for renewable energy projects. CBDC can also be used to support private investment in clean energy. CBDCs can also be used to develop grant financing, mezzanine financing, project financing and bonds for strategic and non-strategic clean energy project. CBDC platforms can also integrate payments and other financial services for service providers in the clean energy sector. CBDC can also be used to develop financing instruments, using public funds, to scale up the deployment of renewable energy technologies.

SDG8 – Using CBDC to achieve ‘decent work and economic growth’

CBDC payment solutions can be used to improve decent work and economic growth by promoting a more efficient payment of workers’ wages and salaries. CBDC payment solutions can also be used to eliminate forced labour and slavery as all payments will be made into the account of the actual worker rather than into the account of the slave masters. CBDC payment solutions can also be used to provide a more efficient means of payment for transactions made by economic agents toward economic growth. Innovative CBDC solutions can be used by economic agents to collect and process payments and to close revenue leakages which ultimately increase the level of productivity towards sustained economic growth. CBDC can also be used as a domestic monetary policy instrument to mop up excess liquidity in the banking sector in order to control rising inflation and accelerate economic growth. CBDC can also be used as a fiscal policy tool by channeling public funds, in the form of CBDC-based cash transfers, to support poor households and small businesses, thereby contributing to sustainable economic growth.

SDG9 – Using CBDC to achieve a sustainable ‘industry, innovation and infrastructure’

Innovative CBDC solutions can be used to facilitate investment in the development of well-functioning and resilient infrastructure which is the foundation of every successful community. Innovative CBDC solutions can be used to obtain the funds needed to upgrade existing industries and infrastructure. CBDC solutions can also be used to facilitate the development of innovative sustainable technologies that help to develop new industries and infrastructure, which will bring prosperity, create jobs and build a stable and prosperous society. Innovative CBDC solutions can also be used to facilitate investment for the development of quality, reliable and resilient infrastructure that support the development of existing and new industries. Innovative CBDC solutions can also be used to enhance and increase access to affordable financial services for small-scale industrial and other enterprises. Innovative CBDC solutions can also be used to integrate payments into value chains and markets. Innovative CBDC solutions can be used to mobilize the funds needed to increase scientific research, upgrade industry technological capabilities, and encourage innovation that gives rise to new industries.

SDG10 – Using CBDC to ‘reduce inequality within and among countries’

Reducing inequalities within and among countries are integral to achieving the sustainable development goals. CBDC-based grants can be used to support inequality reduction programs in developing countries. CBDC-based donations and grants can also be used to fund programs aimed at empowering and promoting the social, economic and political inclusion of every member of society. CBDC-based donations and grants can also be used to finance the

implementation of social and economic policies and programs aimed at ensuring equal opportunity, reducing inequalities of outcome, eliminating discriminatory practices and promoting appropriate legislation that reduce inequalities. CBDC payment solutions can also be used to deliver official development assistance, financial flows and foreign direct investment to countries that need it the most, particularly the least developed countries, which helps to decrease the inequality between developed countries and the least developed countries.

SDG11 – Using CBDC to achieve ‘sustainable cities and communities’

CBDC can be used to deliver low-cost mortgages that ensure access to adequate, safe and affordable housing and basic services. CBDC can also be used to offer affordable, accessible, and sustainable payments for public transport systems especially for persons in vulnerable situations, such as women, children, persons with disabilities and older persons. CBDC can also be used to channel investment for the development of accessible, inclusive, green and safe public spaces, particularly for women, children, older persons and persons with disabilities. CBDC can also help to develop payment infrastructure that helps to build the resilience of communities. CBDC can be used to channel loans and financial aid to support least developed countries in building sustainable and resilient urban and rural buildings using local materials.

SDG12 – Using CBDC to achieve ‘responsible consumption and production’

CBDC payment solutions can be used to enhance financial flows into sustainable consumption and production. CBDC can also be used to track responsible consumption and production spending patterns, and to identify financial flows that are channeled to responsible and irresponsible consumption and production. CBDC can also be used to finance programs that encourage the sustainable management and use of natural resources. CBDC also be used to offer loans to support companies that adopt sustainable practices. CBDC can also be used to finance programs that promote public procurement practices that are sustainable. CBDC can also be used to finance programs that promote and encourage environmentally sound management of chemicals and wastes generated from consumption and production activities. CBDC can also be used to finance programs that increase awareness for sustainable development and lifestyles in harmony with nature.

SDG13 – Using CBDC for ‘climate action’

CBDC can be used to channel funds for financing activities and projects that strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. Innovative CBDC payment solutions can be used to track payments related to climate action. CBDC solutions can be used to raise climate finance that can be used to help countries adapt and mitigate the effects of climate change. Such CBDC solutions can also be used to raise funds that can be channeled to developing national climate plans and to fund research-based programs and projects aimed at climate change adaptation and mitigation. CBDC can also be used to support climate action by unlocking the potential of climate finance which helps to achieve the Paris Agreement goals for reducing greenhouse gas emissions and improving resilience to climate change. CBDC solutions can be used for the digitization of climate-related lending, and to ease debt financing for climate investments. CBDC solutions can also enable central banks to analyse CBDC-based climate-related financial transactions with the help of statistical tools to generate climate-specific systemic risk scenarios and conduct stress-test simulations for effective climate risk management and governance in the financial sector.

SDG14 – Using CBDC to achieve a ‘sustainable life below water’

CBDC-based financial instruments can be used to raise the debt and equity funds that are needed to finance activities and projects aimed at the conservation and the sustainable use of the oceans, seas and marine resources for sustainable development. CBDC-based financing can give ship-owners and investors multiple ship-financing opportunities. CBDC-financing can also be used to create and develop a sustainable blue economy financial system. CBDC can also be used to finance programs that promote the careful management of marine protected areas and ocean resources which are a key feature of a sustainable future. CBDC payment platforms can also be used to channel public funds to programs and projects that prevent or reduce marine pollution of all kinds. CBDC can also be used to raise funds for scientific research into the reduction of ocean acidification. CBDC can also be used to collect donations that will be used to run awareness campaign about the effects of plastic use on the seas and oceans. CBDC can also be used to fund policy activities and projects focused on promoting good governance, participatory decision-making processes and best practices in fisheries. CBDC can also be used to improve access to affordable financial services for small-scale artisanal fishers to increase their access to marine resources and markets. CBDC can also be used to raise funds to support efforts aimed at measuring the ocean condition.

SDG15 – Using CBDC to achieve a ‘sustainable life on land’

CBDC can be used to mobilize financial resources to finance activities, programs and projects aimed at protecting, restoring and promoting sustainable use of terrestrial ecosystems. CBDC can also be used to finance activities, programs and projects aimed at managing forests in a sustainable way, combating desertification, halting and reversing land degradation and halting biodiversity loss. CBDC can also be used to mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives for forest conservation and reforestation. Innovative CBDC financial instruments can be used to mobilize and increase financial resources to conserve and sustainably use biodiversity and ecosystems. CBDC can also be used to raise donations that help to preserve the benefits of land-based ecosystems.

SDG16 – Using CBDC to achieve ‘peace, justice and strong institutions’

CBDC-based funding can be used to finance activities, programs and projects aimed at promoting peaceful and inclusive societies for sustainable development. CBDC-based funding can also be used to raise funds to support institutional activities, programs and projects aimed at promoting rule of law, equal access to justice for all, and accountable and transparent institutions at all levels. Innovative CBDC financial instruments can also be used to raise funds to support institutional enforcement activities aimed at reducing violence, abuse, exploitation, trafficking, violence of women and children, illicit financial flows, illicit arms flows, organized crime, bribery and corruption. Innovative CBDC financial instruments can be used to raise funds to support policy activities and programs aimed at ensuring inclusive and participatory decision-making, ensuring public access to information, protecting fundamental freedoms, and promoting and enforcing non-discriminatory laws and policies for sustainable development.

SDG17 – Using CBDC to achieve ‘partnership for the goals’

CBDC-based financial instruments can be used to finance programs and activities that enhance global partnership for sustainable development, and programs that encourage and promote effective public, public-private and civil society partnerships. CBDC-based payment solution can also be used to channel official development assistance (ODA) commitments to developing countries, in order to achieve the target of 0.7 per cent of ODA/GNI to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries. Innovative CBDC payment solutions can also be used to mobilize additional financial resources for developing countries from multiple sources. More importantly, CBDC can be used as the dominant trade currency to

promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization.

3. Conclusion

This study examined the role of central bank digital currency in achieving the sustainable development goals. It was argued that a central bank digital currency can unlock financing for sustainable development, provide suitable access to capital and increase payment efficiency. CBDC can also increase the speed of transaction chains and provide greater capital efficiency for investment in sustainable development activities and projects. The implication of the study is that a CBDC can support the realization of the United Nations sustainable development goals. Policy makers should ensure that the CBDC in their respective countries is designed to incorporate features that take into account sustainable development concerns for the attainment of the United Nations sustainable development goals. Future studies should investigate how CBDC can support the attainment of circular economy goals (Ozili, 2022). Such studies should assess how retail CBDC can support the attainment of specific circular economy goals. Future studies can also assess how CBDC can be used to achieve other economic development objectives.

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