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Issues in measuring digital assets based on the 2025 SNA – focusing on the discussions regarding crypto assets[1]

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[1] This contribution was prepared for the conference. The views expressed in this publication are those of the authors and do not necessarily represent the official views of the Committee, its members, or the BIS.

Issues in measuring digital assets based on the 2025 SNA – Focusing on the discussions regarding crypto assets –[1]

Yoshiko Sato[2]

Abstract

This paper firstly reviews digital assets in the financial accounts, based on the 2025 SNA currently being drafted. After a discussion of the definition and classification of digital assets in the 2025 SNA, this paper outlines a number of points which require further elaboration in the explanation of the SNA or in its compilation manuals, including on non-financial accounts. The paper discusses the conceptual and compilation issues of non-liability crypto assets without a corresponding liability in particular.

Keywords: 2025 SNA, digital assets, crypto assets

1 I thank the colleagues at the Bank of Japan for their valuable comments. The views expressed are those of the author and do not necessarily reflect those of the Bank of Japan.

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1. Introduction

Digitalization and digital transformation have an enormous impact on our economic activities. These processes also raise particular statistical challenges of how to measure new digital assets, products, and activities associated with digitalization in macroeconomic statistics appropriately.

In the absence of an agreed definition or classification of digital assets, the revision for the 2025 SNA started in 2020 and guidance notes were developed by the task teams for the revision. Reviewing the guidance note on the recording of fungible crypto assets (GN), Sato (2023a) presented criteria for financial assets based on the SNA framework and proposed a digital assets classification using commonly observed attributes of digital assets. Following this, Sato (2023b) focused on non-liability crypto assets used as a means of payments (NLCA) and discussed whether they should better be classified as produced non-financial assets or non-produced non-financial assets, using a numerical example of recording NLCA in the sequence of national accounts.

2025 SNA is currently being drafted for endorsement at the United Nations Statistical Commission in March 2025. As of July 2024, most of the chapters have become available on the web, consolidated as the 2025 System of National Accounts draft for global consultation. At the same time, with regards to crypto assets, the IMF has been preparing the Compilation Guidance on Crypto Assets to provide practical guidance on the recording of crypto assets.

The paper is structured as follows. Section 2 looks at the currently available draft 2025 SNA and reviews the definition and classification of digital assets and the typology of crypto assets. It considers the distinction between financial and non-financial assets using the classification proposed in Sato (2023a). Section 3 presents a numerical example of recording NLCA based on the GN and reveals statistical inconsistencies on a global basis. Then, three alternative options for recording NLCA are proposed. Section 4 refers to other issues which require further elaboration in the SNA and in the Compilation Guidance on Crypto Assets. Section 5 concludes the paper.

2. Digital assets

2-1. Digital assets in the 2025 SNA

Digitalization is one of the highest priority issues in the revision for the 2025 SNA. The 2025 SNA therefore introduces an entirely new chapter specifically for this topic. Chapter 22 considers the main conceptual and measurement issues related to digitalization in national accounts. In the chapter, digital assets are defined as *assets that exist only in digital form such as crypto assets* (¶22.2). It also gives the definition of crypto assets as *digital representations of value that use cryptography and distributed ledger technology (DLT) such as blockchains to enable parties to transact directly with each other without the need for a trusted intermediary* (¶22.84).

2-2. Criteria for financial assets in the 2025 SNA

On the criteria for financial assets in general, the 2025 SNA inherits the distinction between financial and non-financial assets from the 2008 SNA. Financial assets, in principle, should have a counterpart liability. The 2025 SNA defines an asset as: *a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the item over a period of time* (¶4.5). *Benefits are exchanged by means of payments. From this, a financial claim, and hence a liability, can be defined* (¶4.104). *A liability is established when one unit (the debtor) is obliged, under specific circumstances, to provide a payment or series of payments to another unit (the creditor)* (¶4.105). *Whenever a liability exists, there is a corresponding financial claim that the creditor has against the debtor. Financial claims are financial instruments that give rise to an economic asset that has a counterpart liability, including shares and other equity in corporations. As such, a financial claim gives rise to the payment or series of payments due to the creditor by the debtor under the terms of a liability* (¶4.107). This means that in recording the financial account, all financial assets (the creditors) entail corresponding liabilities (the debtors), with the exception of monetary gold (¶4.109).

Section D in Chapter 22 gives a general explanation of the distinction between financial and non-financial assets for crypto assets. A*ll types of crypto assets are within the SNA asset boundary. Crypto assets with a corresponding liability are classified as financial assets.* ⋯ *On the other hand, crypto assets without a corresponding liability are classified as non-produced, non-financial assets within a separate category* (¶22.87).

2-3. Crypto assets designed to act as a general or specific medium of exchange in the 2025 SNA

The 2025 SNA poses a challenge to macroeconomic statistical classification in assessing generality and its coverage of the crypto asset as a medium of exchange. Section D of Chapter 22 provides three broad categories on the typology of fungible crypto assets using the same decision tree as in the GN: (1) those designed to act as a general medium of exchange (which are further divided in those with, and those without, a corresponding liability); (2) those designed to act as a medium of exchange within a platform or network (again divided into those with, and those without, a corresponding liability); and (3) security crypto assets.

2-4. Classification of digital assets

As observed in sub-section 2-2, the criteria for financial assets in 2008 SNA are kept unchanged in 2025 SNA, regardless of whether the assets in question are digital or not. As with the classification of digital assets proposed in Sato (2023a) shown in Chart 1, the criteria that digital assets are classified as financial or non-financial depends on whether there is a corresponding liability. Examples of digital assets include stablecoins, other types of crypto assets used as a means of payment with a corresponding liability, prepaid payment instruments, bank deposits, central bank digital currency (CBDC), security tokens, and digital assets without a corresponding liability (NLCA). Among them, there are those issued by public sector and others by private sector. Crypto assets and CBDC are both categorized as digital assets, but are separated into different categories.

On the other hand, the typology of fungible crypto assets in the 2025 SNA, which is reviewed in sub-section 2-3, should be reconsidered. As mentioned in Sato (2023a) and Sato (2023b), for the sake of statistical continuity and stability, statistical classifications based on generality or its coverage of the crypto asset as a medium of exchange should be avoided as there is a possibility that the future technologies may create new types of crypto assets which have a capacity of increased interoperability with different platforms.

3. NLCA

3-1. NLCA in the 2025 SNA

The draft chapters of 2025 SNA provide conceptual guidance for NLCA in the case of mining (proof of work). Chapter 22 makes three important points. Firstly, *Validation of crypto asset transactions is a service. The process of validating transactions in crypto assets is known as mining in the case of crypto assets without a corresponding liability that rely on proof of work for ensuring the security of transactions* (¶22.88). Secondly, *this process includes the release of new units of the crypto asset as an implicit fee paid to the miner validating the transaction. The miner validating the transaction also receives an explicit fee in crypto assets paid by the party initiating the transaction, which is normally the sender/seller* (¶22.88). It clarifies that there are two types of fees paid to the miner; the implicit fee rewarded with newly released units of the NLCA and the explicit fee paid in the existing units of the NLCA by the party initiating the transaction. Finally, the use of the produced validation services is allocated to consumption; the validation services rewarded with newly released units *are assumed to be collectively consumed by the existing holders of units of the crypto asset, while those rewarded by the explicit fee are consumed by the transactor paying the fee (normally the sender/seller)* (¶22.88).

3-2. Numerical examples of NLCA in the GN

Numerical examples of the case of mining (proof of work) are provided in Annex IV of the GN. The main assumptions are that in Country A, there is a production of validation service rewarded in new coin (90 as an implicit fee) and a production of validation service paid in existing coin (10 as an explicit fee) by Country B. The newly mined coin (90) emerges in Community C and are recorded in other changes in the volume of assets and liabilities account. Another assumption is that the owners of existing coin (units of the NLCA) are all non-residents, thus the services produced in Country A are all exported. Community C imports the validation service (90) in exchange for the newly mined coin (90). The imported service is taken as final consumption in Community C. It is critical to note that Community C in the GN is only conceptual and does not exist in the real world.

3-3. Study on recording of NLCA based on the 2025 SNA and the GN

In order to study in detail whether transactions are balanced in the global economy, Table 1 presents numerical examples following the GN as mentioned in the sub-section 3-2, and expands the example from Sato (2023b) into a multinational framework. The example in Sato (2023b) only shows the miner's country of residence (Country A). Table 1 also shows Country B where the transactor is resident and for the crypto asset community (Community C). Transactions to be recorded in Community C are not observable nor being recorded in any real country as noted above. Consequently, they are left as unbalanced values, such as in savings and in current account balance, as highlighted yellow in the Table 1. This creates statistical inconsistencies on a global basis.

3-4. Proposal for recording NLCA

Taking the above mentioned issues into account, in the case of mining (proof of work), without assuming crypto asset community (Community C), below are some proposals for alternative options for recording NLCA.

- The emergence of newly mined coin (90) are recorded in other changes in the volume of assets and liabilities account in Country A where the miners are resident (services are produced), instead of in Community C.
- For the recording of consumption of the validation services rewarded by new coin (90), three options are considered:
  (1) To allocate the consumption of the validation services rewarded by new coin across countries where the holders of existing coin are resident.
  (2) To assume transactors, either buyers or sellers, possibly sellers, consume the total value of validation services rewarded by new coin (90).
  (3) To assume transactors, both buyers and sellers, consume half of the validation services rewarded by new coin, respectively (45:45).
- In the balance of payments, the export of validation service rewarded in new coin (90) is recorded. For the corresponding entry, the same amount is recorded as current transfer in the current account according to the BPM6[3]: *A transfer is an entry that corresponds to the provision of a good, service, financial asset, or other non-produced asset by an institutional unit to another institutional unit when there is no corresponding return of an item of economic value* (BPM6 ¶12.7).

All the above options could ensure consistency on a global basis when considering the total sum across all countries. Of these options, option (1) is the most preferable, representing the idea that the holders of existing coin are to be benefitted. However, it is highly challenging because there is no data on the geographical

[3] The GN assumes that the new coin emerges abroad in a crypto assets community (Community C), and the acquisition of the new coin is recorded for the corresponding entry to the export of validation service (90) in the capital account (acquisitions/disposals of non-produced non-financial assets) as shown in the Table1. On the other hand, the above proposal assumes that the new coin emerges in Country A where the services are produced and are not traded externally.

distribution of residency of existing holders. Options (2) and (3) are equally second best options to be considered.

As discussed above, both the theoretical and the practical aspects are essential when considering the recording of NLCA. Data sources for crypto assets to compile macroeconomic statistics are currently almost non-existent. Better options might emerge when the data source for NLCA is available. Taking all things into consideration, further discussion on the recording of NLCA is necessary. It would be desirable for the Compilation Guidance on Crypto Assets prepared by the IMF to include more detailed explanation on the recording NLCA.

4. Other issues for further elaboration

This chapter briefly touches upon other issues that have not been mentioned in Section 3 but which require further elaboration in the framework of SNA.

4-1. Staking of crypto assets

Validation services in the case of mining (proof of work) is the main focus of Section 3. However, there are other types of validation services. One of them, staking, also requires clarification. In the current draft of 2025 SNA, explanations on the "staking" of crypto assets are limited to the following: *Non-mineable crypto asset without a corresponding liability enter into circulation in two different ways. They may be released via an explicit sale and/or as payment to validators that validate transactions in different ways than via proof-of-work (e.g., via proof of stake or proof of authority)* (¶7.228). T*he key difference between crypto asset without a corresponding liability generated through mining (proof-of-work) and other validation (e.g., proof-of-stake) processes is that the intermediate inputs associated with the validation process of non-mineable crypto assets are significantly less than those which are required by mineable crypto assets. The validation process does not always require specialized computing equipment and the level of energy required is generally less than in the mining processes* (¶7.229).

Further explanations regarding the staking of crypto assets should be included in the Compilation Guidance on Crypto Assets.

4-2. Lending crypto assets

The treatment in the SNA of the lending of crypto assets also requires clarification. Conceptually, different types of lending transactions according to the combination of assets could be envisaged: (i) cash vs NLCA, (ii) stablecoins vs NLCA, and (iii) NLCA vs NLCA. In the 2025 SNA, securities repurchase agreement and security lending transaction are regarded as financial transactions and are classified as "Loans" (¶12.80). However,… *If a securities repurchase agreement does not involve the supply of cash (that is, there is an exchange of one security for another, or one party supplies a security without collateral), there is no loan or deposit* (¶12.81). In the case of NLCA lending, the assets lent are non-financial assets.

One question arising from this treatment is whether (i) cash vs NLCA lending should be regarded as a financial transaction. A second question is how to treat (ii) stablecoins vs NLCA and (iii) NLCA vs NLCA lending transactions. The Compilation Guidance on Crypto Assets drafting team prepared an issue note for related issues to discuss at the meeting of the Advisory Expert Group on National Accounts (IMF 2024). The issues mentioned above should also be considered in this discussion.

4-3. Industrial classification of miners' activities

The complete structure of the UN International Standard of Industrial Classification (ISIC) Rev.5 was endorsed at the 54th UN Statistical Commission in 2023. While the ISIC classification has basically the same scope of production as defined in the SNA, the ISIC rev.5 further enhances the relationship with the 2025 SNA by reflecting digitalization. Classification of crypto assets related activities is one of the issues considered and some of them are added as inclusion and exclusion examples in relevant categories in the Explanatory Notes (Task Team on ISIC 2024b).

Issuing, validating and mining activities of crypto assets are classified according to whether the underlying crypto assets have a corresponding liability (Table 2)[4]. In terms of the issuing activities, if the crypto assets have a corresponding liability, issuance of such assets is regarded as a financial service provision (Section L: 6499). On the other hand, if they do not have a corresponding liability (NLCA), issuance of the assets is regarded as non-financial service provision (Section K: 6310 computing infrastructure, data processing, hosting and related activities). This is in line with the asset classification in the 2025 SNA. In terms of the validation and mining activities, no examples are found for NLCA, whereas they are auxiliary financial service provision (Section L: 6619) for the crypto assets with a corresponding liability.

Several questions arise from these categorizations, for example, as to whether "issuing" and "mining" of NLCA are different concepts. If they are the same, validation and mining of NLCA should also be considered as Section K: 6310 activity. Otherwise, clarification of the concepts, as well as presenting the specific name of category applied for the mining of NLCA, would be practical and useful development for the compilation of statistics.

4-4. Exchange traded funds (ETF) of NLCA

Physically-backed exchange traded funds (ETF) which hold NLCA as their main assets have been approved by the U.S. Securities and Exchange Commission (SEC), in addition to the already approved and traded future-based ETFs of NLCA[5]. Hereafter, the former is called "Spot ETFs of NLCA" and the latter "Future ETFs of NLCA". Spot ETFs of NLCA have potential to be a common investment choice.

Clarification of the sector classification of these ETFs is necessary. In Chapter 29 of the currently available draft 2025 SNA, investment funds are explained in the

4 In the ISIC Rev.5, trading and brokerage activities of crypto assets are also considered and listed as examples in the relevant categories, although they are not discussed in this paper.

5 Spot bitcoin ETF was approved in January 2024 followed by spot ether ETF in May 2024. Future bitcoin ETF had been approved in October 2021.

following way: *MMFs and non-MMF investment funds issue shares or units in the fund and invest predominantly in financial assets* (¶29.55). According to this explanation, Spot ETFs may not fall into financial corporations sector, such as Non-MMF investment funds (S124). This is because the main assets of Spot ETFs of NLCA are non-financial assets. One of the examples in draft chapter 29 explains that the funds which hold real estate as their major assets are non-financial corporations and are excluded from Non-MMF investment funds (¶29.54). As discussed above, it seems that Spot ETFs may not be classified into financial corporation sector, but this needs to be clarified in the 2025 SNA. On the other hand, it is clear that Future ETFs of NLCA are classified into the financial corporations sector, as they are one of the Non-MMF investment funds, holding financial derivatives of futures as their main assets.

4-5. Possibility of NLCA classification change from non-financial assets to financial assets

The current 2025 SNA drafts NLCA as non-produced non-financial assets, as presented in Section 3. It also mentions the possibility of NLCA classification change from non-financial assets to financial assets in the future.

The 2025 SNA draft (¶11.173) states that *Crypto assets more generally are a relatively new phenomenon, certainly at the time of writing these standards. As a consequence, the role of crypto assets without a counterpart liability designed to act as a medium of exchange may change in the future, and such crypto assets may qualify as money, to be recorded as financial assets. Important conditions for such a classification are that these assets are (i) authorised by government; (ii) generally accepted as a means of payments, including paying taxes with such assets; (iii) serving as a unit of account; and (iv) widely used as a medium of exchange. In respect of these future developments, the classification of crypto assets without a counterpart liability designed to act as a medium of exchange has been put on the research agenda*[6] (¶11.173). Additionally, the 2025 SNA states *if a crypto asset without a corresponding liability is ever able to gain widespread acceptance as a general medium of exchange, the guidance on its classification may be re-considered* (¶22.87).

These explanations in the 2025 SNA imply that there may be a possible change in the NLCA classification depending on its usage in the future. Consideration of such a change will depend on ongoing studies and discussions at the global level, which will provide the key to success in terms of updating international statistical manuals.

5. Conclusion

This paper looks at how the currently available draft 2025 SNA deals with digitalization. Reviewing the definition for digital assets in the 2025 SNA including the distinction between financial and non-financial assets, and the typology of crypto assets, it discusses the classification of digital assets proposed in Sato (2023a) and points out a challenge for macroeconomic statistics in NLCA classification. It then

[6] Annex 5 will be prepared for the future agenda in the 2025 SNA.

presents a numerical example of recording NLCA following the GN and reveals the statistical inconsistencies on a global basis. With these issues in consideration, this paper proposes three alternative options for recording NLCA without assuming crypto asset community. Following these alternatives, it is clear that further discussion is necessary to improve the recording of NLCA. Finally, other remaining issues relating to crypto assets are briefly presented including staking, lending, and ETFs.

The 2025 SNA takes an important step forward toward capturing digitalization. It gives us a broad picture of digitalization and provides conceptual clarification and guidance on several recording issues. It is hoped that the remaining issues raised in this paper will also to be clarified in the 2025 SNA or in its related compilation manuals. Ongoing efforts are necessary, recognizing that digitalization is evolving and rapidly changing its form.

The technologies related to crypto assets, in particular, are likely to give rise to various products. They impose challenges in delineating financial assets and non-financial assets and demonstrate the need for careful consideration in determining their method of recording within the SNA framework. The Compilation Guidance on Crypto Assets prepared by the IMF should include detailed explanations of recording NLCA adopted in 2025 SNA.

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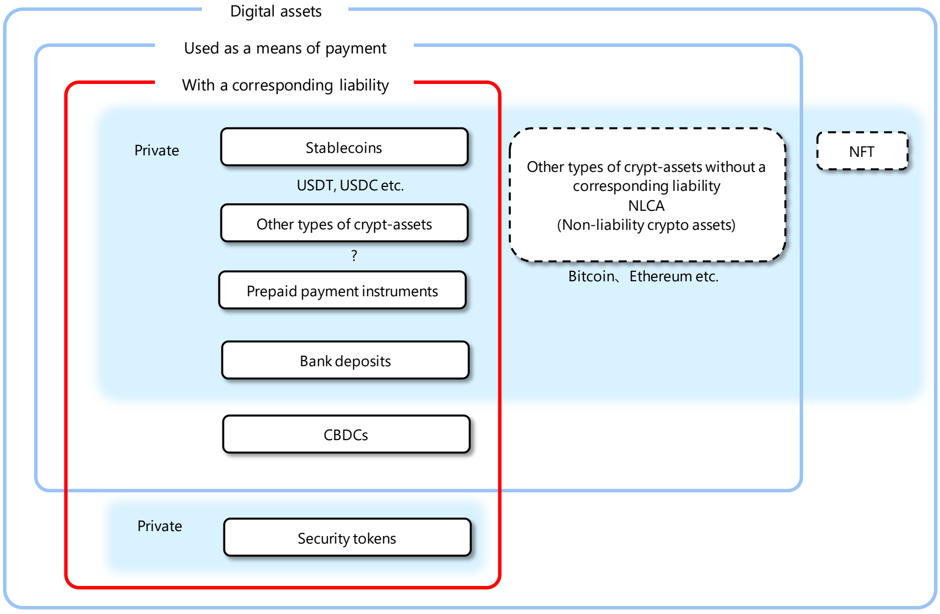
Digital assets classification Chart 1



Assets within a red frame are financial assets. Those outside are non-financial assets.
USDT: Tether, USDC: USD Coin, NFT: Non-fungible tokens
Source: Sato (2023a)

An example of recording NLCA in the world　　Table 1

		Country A			Country B	A+B	Community C	World Total A+B+C
			new coin	existing coin	existing coin		new coin	
Production account	Output	100	90	10	0	100	0	100
	output of services	100	90	10	0	100	0	100
	output of goods	0	0	0	0	0	0	0
	Intermediate consumption	80	80	0 (*)	0	80	0	80
	Value added	20	10	10	0	20	0	20
Use of Income account	Final consumption	0	0	0	10	10	90	100
	Savings	20	10	10	-10	10	-90	-80
Capital account	Gross capital formation	0	0	0	0	0	0	0
	Acquisitions less disposals of non-produced assets	100	90	10	-10	90	-90	0
	Capital transfers	0	0	0	0	0	0	0
	Net lending/borrowing	-80	-80	0	0	-80	0	-80
Financial account	Net lending/borrowing (financial account)	-80	-80	0	0	-80	0	-80
	Currency and deposits	-80	-80	0	0	-80	0	-80
Other changes in the volume of assets and liabilities account	Change in stock of financial assets	-80	-80	0	0	-80	0	-80
	Change in stock of non-financial assets	100	90	10	-10	90	0	90
	Due to transactions	100	90	10	-10	90	-90	0
Revaluation account	Due to other changes in the volume of assets and liabilities	0	0	0	0	0	90	90
	Due to revaluation	0	0	0	0	0	0	0
	Change in net worth	20	10	10	-10	10	0	10
Balance sheets	Opening balance sheet	100	100	0	100	200	0	200
	Produced assets	0	0	0	0	0	0	0
	Non-produced assets	0	0	0	100	100	0	100
	Financial assets	100	100	0	0	100	0	100
	Closing balance sheet	120	110	10	90	210	0	210
	Produced assets	0	0	0	0	0	0	0
	Non-produced assets	100	90	10	90	190	0	190
	Financial assets	20	20	0	0	20	0	20
Balance of payments	Current account	100	90	10	-10	90	-90	0
	Goods	0	0	0	0	0	0	0
	Services	100	90	10	-10	90	-90	0
	Capital account	-100	-90	-10	10	-90	90	0
	Financial account	0	0	0	0	0	0	0
International investment position	Opening value of IIP	0	0	0	0	0	0	0
	Closing value of IIP	0	0	0	0	0	0	0

Note: (*) Intermediate consumption is collectively shown in the new coin column (80).

Issuing, validating and mining activities of crypto assets in the treatment of ISIC rev.5 Table 2

		Crypto assets with a corresponding liability		Crypto assets without a corresponding liability	
Issuing	Section	L	Financial and insurance activities	K	Telecommunications, computer programming, consultancy, computing infrastructure, and other information service activities
	Division	64	Financial service activities, except insurance and pension funding	63	Computing infrastructure, data processing, hosting, and other information service activities
	Class	6499	Other financial service activities n.e.c., except insurance and pension funding activities	6310	Computing infrastructure, data processing, hosting and related activities
Validation and mining	Section	L	Financial and insurance activities		
	Division	66	Activities auxiliary to financial service and insurance activities		
	Class	6619	Other activities auxiliary to financial service activities, except insurance and pension funding		

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The views expressed are those of the author and do not necessarily reflect those of the Bank of Japan.

Motivation

- At the IFC Biennial Conference in 2022, Sato (2023a) presented criteria for financial assets based on the SNA framework and proposed a digital assets classification. At the ISI WSC in 2023, Sato (2023b) discussed the asset classification of non-liability crypto assets used as a means of payment (NLCA).

- The 2025 SNA is currently being drafted for endorsement at the United Nations Statistical Commission on March 2025. Meanwhile, with regards to crypto assets, IMF has been preparing the Compilation Guidance on Crypto Assets to provide practical guidance on the recording of crypto assets.

- This paper reviews :
  - The definition and classification of digital assets, crypto assets including NLCA, and the criteria for financial assets in the 2025 SNA
  - A numerical example of recording NLCA in the case of mining (proof of work) based on the guidance note (F.18) and reveals statistical inconsistencies on a global basis
  - Considers alternative three options
  - Briefly presents other remaining issues of crypto assets

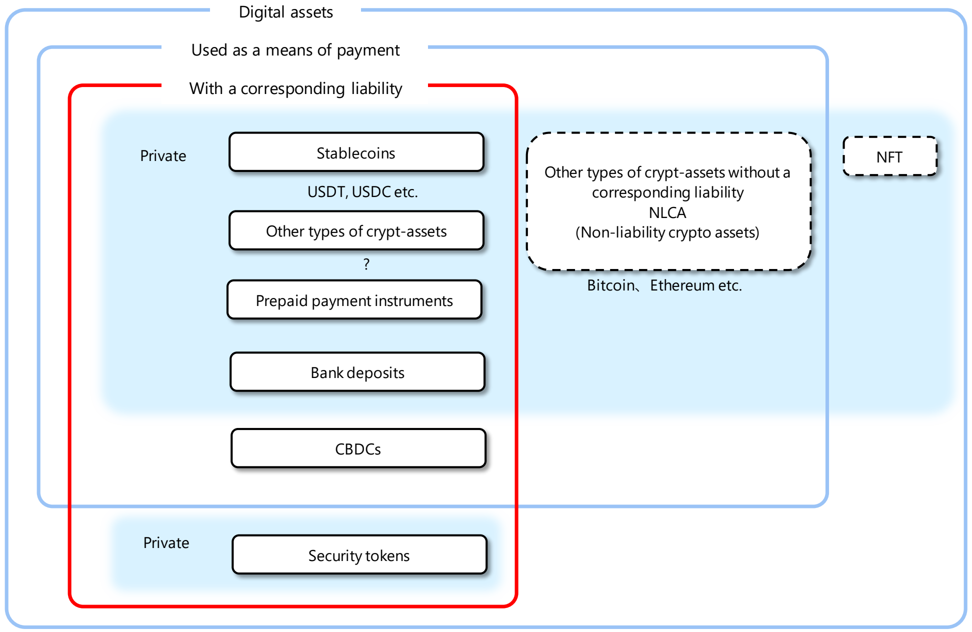
Digital assets in the 2025 SNA

- Digital assets: Assets that exist only in digital form such as crypto assets (¶22.2).

- Crypto assets: Digital representations of value that use cryptography and distributed ledger technology (DLT) such as blockchains to enable parties to transact directly with each other without the need for a trusted intermediary (¶22.84).
  All types of crypto assets are within the SNA asset boundary (¶22.87).

- Criteria for financial assets: the same as in the 2008 SNA. All financial assets (the creditors) entail corresponding liabilities (the debtors), with the exception of monetary gold (¶4.109).

Classification of digital assets



Crypto assets with a corresponding liability are classified as financial assets.
Crypto assets without a corresponding liability (NLCA) are classified as non-produced, non-financial assets (¶22.87).

Digital assets in the 2025 SNA (Cont'd)

The typology of crypto assets:
(1) Those designed to act as a general medium of exchange
(2) Those designed to act as a medium of exchange within a platform or network
(3) Security crypto assets

The 2025 SNA poses a challenge to macroeconomic statistical classification in assessing generality and its coverage of the crypto assets as a medium of exchange.

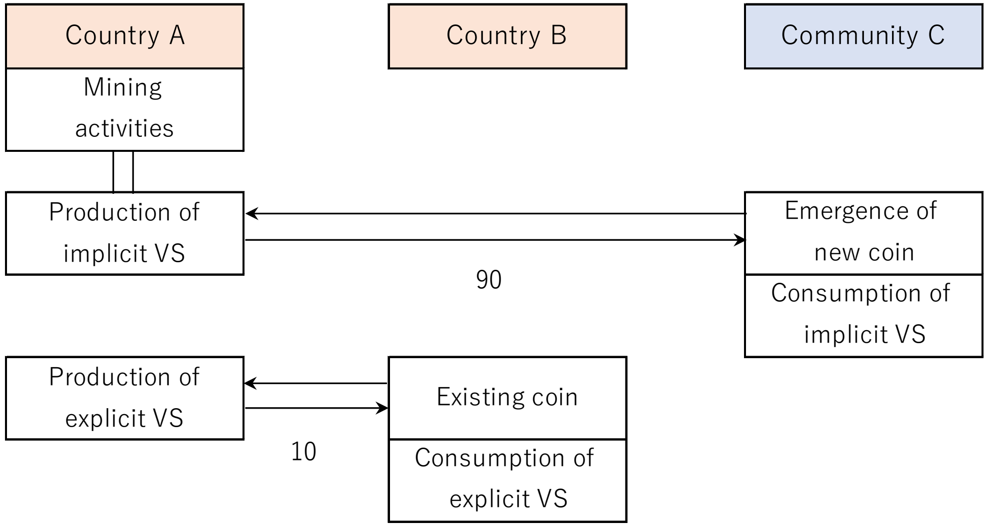
The typology of fungible crypto assets in the 2025 SNA should be reconsidered. For statistical continuity and stability, statistical classifications based on generality or its coverage of the crypto asset as a medium of exchange should be avoided.

This is because future technologies may create new types of crypto assets which have a capacity of increased interoperability with different platforms.

Recording of NLCA based on the 2025 SNA

- The draft chapters of the 2025 SNA provide conceptual guidance for NLCA in the case of mining (proof of work).
- The 2025 SNA clarifies:
  - Validation of crypto asset is a service; the implicit/explicit fee; the validation service is allocated to consumption.
- The guidance note on crypto assets (F.18) assumes in the case of mining (proof of work):
  The miner in Country A produces validation service rewarded in new coin (90 as an implicit fee) and produces validation service paid in existing coin (10 as an explicit fee) by Country B where the transactor is resident. The newly mined coin (90) emerges in the Community C.

- The Community C as explained in the GN is only conceptual and does not exist in the real world.
- The transactions to be recorded in the Community C are not observable. They are left as unbalanced values, such as in savings and in the current account balance.



VS : validation service

Recording of NLCA based on the 2025 SNA (Cont'd)

Based on the guidance note (F.18)

		Country A			Country B	A+B	Community C	World Total A+B+C
			new coin	existing coin	existing coin		new coin	
Production account	Output	100	90	10	0	100	0	100
	output of services	100	90	10	0	100	0	100
	output of goods	0	0	0	0	0	0	0
	Intermediate consumption	80	80	0 (*)	0	80	0	80
	Value added	20	10	10	0	20	0	20
Use of Income account	Final consumption	0	0	0	10	10	90	100
	Savings	20	10	10	-10	10	-90	-80
Capital account	Gross capital formation	0	0	0	0	0	0	0
	Acquisitions less disposals of non-produced assets	100	90	10	-10	90	-90	0
	Capital transfers	0	0	0	0	0	0	0
	Net lending/borrowing	-80	-80	0	0	-80	0	-80
Financial account	Net lending/borrowing (financial account)	-80	-80	0	0	-80	0	-80
	Currency and deposits	-80	-80	0	0	-80	0	-80
Other changes in the volume of assets and liabilities account	Change in stock of financial assets	-80	-80	0	0	-80	0	-80
	Change in stock of non-financial assets	100	90	10	-10	90	0	90
	Due to transactions	100	90	10	-10	90	-90	0
Revaluation account	Due to other changes in the volume of assets and liabilities	0	0	0	0	0	90	90
	Due to revaluation	0	0	0	0	0	0	0
	Change in net worth	20	10	10	-10	10	0	10
Balance sheets	Opening balance sheet	100	100	0	100	200	0	200
	Produced assets	0	0	0	0	0	0	0
	Non-produced assets	0	0	0	100	100	0	100
	Financial assets	100	100	0	0	100	0	100
	Closing balance sheet	120	110	10	90	210	0	210
	Produced assets	0	0	0	0	0	0	0
	Non-produced assets	100	90	10	90	190	0	190
	Financial assets	20	20	0	0	20	0	20
Balance of payments	Current account	100	90	10	-10	90	-90	0
	Goods	0	0	0	0	0	0	0
	Services	100	90	10	-10	90	-90	0
	Capital account	-100	-90	-10	10	-90	90	0
	Financial account	0	0	0	0	0	0	0
International investment position	Opening value of IIP	0	0	0	0	0	0	0
	Closing value of IIP	0	0	0	0	0	0	0

Alternative options

- Without assuming crypto asset community (Community C).
- The newly mined coin (90) emerges in Country A.
- The consumption of the validation service (90) is to be allocated

  (1) across countries where the holders of existing coin are resident, or

  (2) to either buyers or sellers, possibly sellers, for the total value (90), or

  (3) to both buyers and sellers by half (45:45).
- In the balance of payments, the export of 90 is recorded and the same amount of current transfer as a corresponding entry.

(1) Is the best option but highly challenging.
(2) and (3) are the second best options.

Other issues requiring further elaboration

1. Staking of crypto assets
   A way for non-minable crypto assets without a corresponding liability to enter into circulation via other means than proof of work. Explanations are limited in the current 2025 SNA.

2. Lending of crypto assets
   Different types of lending transactions according to the combination of assets could be envisaged:
   (i) cash vs NLCA, (ii) stablecoins vs NLCA and (iii) NLCA vs NLCA.
   (i) cash vs NLCA lending is a financial transaction? How to treat (ii) and (iii) ?

3. ISIC classification of miners' activities
   Is the validation and mining activity of NLCA to be classified in Section K: 6310 (computing infrastructure, data processing, hosting and related activities) or somewhere else?

4. Exchange traded funds (ETFs) of NLCA
   Sector classification of spot (physically-backed) ETFs of NLCA should be clarified. They may not fall into the financial corporations sector, such as Non-MMF investment funds (S124).

5. Possibility of NLCA classification change from non-financial assets to financial assets
   The 2025 SNA implies there is a possibility that the NLCA classification could change depending on its usage in the future.
   - The role of crypto assets without a counterpart liability designed to act as a medium of exchange may change in the future, and such crypto assets may qualify as money, to be recorded as financial assets (¶11.173).
   - If a crypto asset without a corresponding liability is ever able to gain widespread acceptance as a general medium of exchange, the guidance on its classification may be re-considered (¶22.87).

Conclusions

- The 2025 SNA takes an important step forward towards capturing digitalization.
- This paper reviews the definition for digital assets in the 2025 SNA including the distinction between financial and non-financial assets, and the typology of crypto assets, and it shows the classification of digital assets.
- It presents a numerical example of recording NLCA following the GN and reveals the statistical inconsistencies on a global basis. It proposes three alternative options in recording NLCA without assuming crypto asset community, and implies that further discussions on the possible methods is necessary to improve the recording of NLCA.
- There are still issues for further elaboration and further discussion. It is hoped that the remaining issues (e.g., staking, lending and ETFs) will also be clarified in the 2025 SNA or in its related compilation manuals.
- The technology related to crypto assets, in particular, are likely to give rise to various products. They impose challenges in delineating financial assets and non-financial assets and demonstrate the need for careful consideration in determining how to record them within the SNA framework. The Compilation Guidance on Crypto Assets prepared by the IMF needs to include detailed explanations of recording NLCA adopted in 2025 SNA. Ongoing discussions, research and the review on a global basis are necessary.