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Updating the recording of the central bank output in the Norwegian National Accounts

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Preface

The purpose of this document is to present the updated procedure for recording the central bank output in the Norwegian National Accounts in the 2022 periodical revision.

Several changes are implemented. In terms of impact on macroeconomic aggregates, the most consequential is that the activity done by Norges Bank's management of the Government Pension Fund Global is identified as a separate product. This reduces the volume of the product "central bank services", which in turn reduces the intermediate consumption of financial corporations, such as deposit-taking corporations. As a result, value-added in this sector increases. The impact on GDP for the Mainland Norway is under 0.2% over the period 2000-2020.

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Abstract

This document presents a description of updating the treatment of the Norwegian central bank output in both the Supply and Use tables (SUTs) and the institutional sector accounts, more in line with the international standards in this regard.

A new market product representing management services provided to the Norwegian Government Pension Fund Global (GPFG) is introduced in the central bank's output. The estimated value of such management services is found to be positively correlated with the market value development of the GPFG over the period 2000-2020, which makes sense.

The new market output leads to an augment of inventory. As a result, GDP increases with the same amount. However, the impact on GDP is not very significant, with the percentage changes, both for the whole Norwegian economy and for the Mainland Norway, being under 0.2% over the period 2000-2020.

The updated central bank nonmarket output is allocated to other financial intermediaries as intermediate consumption in the SUTs, and the respective values are registered as current transfers in the institutional sector accounts. Without the registration of such current transfers as it is the case in the current institutional sector accounts, some important indicators such as saving, net lending/borrowing for both the central bank and the relevant financial intermediaries are measured with bias.

Contents

1. Introduction

The measurement of central banks' activities in the national accounts is not straightforward. Clearly, their activities are primarily not related to producing output that is sold in the marketplace, but it is conceptually not easy, either to define what they produce, or to decide how the products are used and by whom. By convention, the part of their output that is not sold, is to be allocated to the financial intermediation industries,

By reviewing the methods used for registering the output of the central bank in the Norwegian National Accounts (NNA), Statistics Norway has made a few adjustments to the methodology. The largest adjustment relates to a particularity of the Norwegian central bank (*Norges Bank*), namely its role as manager of Norway's sovereign wealth fund, the Government Pension Fund Global (GPFG), on behalf of the Norwegian government.

The services for managing the GPFG are not visibly registered as (part of) Norges Bank's output in the NNA, although the corresponding income due to providing such services is reported as 'Management fee, GPFG' in the income statement of Norges Bank's annual report (e.g., Norges Bank, 2022), and the equivalent expenditure is also shown in the Norwegian Government Accounts [1].

The NNA is compiled in different versions at Statistics Norway. A normal compilation process for the annual national accounts comprises three consecutive provisional and one final versions (see Liu and Steinar, 2022). Moreover, Statistics Norway conducts periodically additional revisions to annual national accounts to various extent, with the largest one in terms of scale and scope being called main revision. A latest middle-scale periodical revision was undertaken in 2022, and the next main revision is planned to be implemented in 2024.

The purpose of this document is to report the updated procedure in the 2022 periodical revision for recording the output of Norges Bank in the NNA by using the international standards, esp., the *European System of Accounts 2010* (hereafter ESA 2010) (see Eurostat, 2013) as criterion. The updated procedure was carried out not only in the final annual national accounts for 2020 which was published in November 2022, but also to the time series of final annual national accounts for the period 2000-2019.

The rest of the document is structured as follows. Section 2 presents and discusses the relevant recommendations in the international standards, and in particular, in ESA 2010 as regards to the treatment and recording of the central bank in the national accounting system. In Section 3, a brief description of the activities of Norges Bank is introduced, highlighting its special role in terms of managing the GPFG fund. In Section 4, the current method for recording the output of Norges Bank in the NNA is thoroughly investigated, by using numerical examples to demonstrate what should be updated, and if not, what consequences they may result in. Unless stated otherwise, all the numerical examples presented in this document use final annual national accounts data for 2019 that are accessed in July 2022.[2] Built on the investigation as reported in Section 4, Section 5 presents the updated recording of the output of Norges Bank, not only in the Supply and Use Tables (SUTs), but also in the institutional sector accounts within the NNA. Again, Year 2019 is also served as an example, showing how the time series during the period 2000-2019 has been updated and re-balanced in the SUTs. In Section 6, impacts on GDP and other economic indicators due to updating are reported. Section 7 concludes.

[1] *Statsregnskapet* in *Norwegian*.

[2] Data are drawn from the three data files of T1_HR2019_2019, T2_HR2019_2019, and T3L_HR2019_2019 in the database of Golden at Statistics Norway.

2. The international standards

In the field of national accounts compilation, there exist two latest international or regional standards, one is the 2008 *System of National Accounts* (hereafter 2008 SNA) (see United Nations, 2009), the other is the ESA 2010 (see Eurostat, 2013). The 2008 SNA provides guidelines on national accounting for all countries throughout the world, while the ESA 2010 gives legal regulations in respect of national accounts compilation and results submission for EU member countries and European Free Trade Association (EFTA) countries including Norway.[3]

In a broad sense, the ESA 2010 is based on the same concepts of the 2008 SNA, and the two international/regional standards are therefore consistent with each other to the largest extent. However, there are some differences between them, with the most important one being that the ESA 2010 aims to be a more accurate response to the European economy, and the descriptions of the concepts are in several instances more specific and precise than those of the 2008 SNA. This difference features the relevant contents as written in the two international/regional standards as regards the central bank in terms of its definition and classification, treatment and valuation of the output, as well as the way the output is allocated to users.

2.1. Definition and classification of the central bank

The 2008 SNA defines the central bank as '*the national financial institution that exercises control over key aspects of the financial system*', including three detailed types of financial intermediaries. In addition, '*as long as the central bank is a separate institutional unit, it is always allocated to the financial corporations sector even if it is primarily a non-market producer*' (para. 4.104, SNA2008).

According to the ESA 2010, '*the central bank subsector (S.121) consists of all financial corporations and quasi-corporations whose principal function is to issue currency, to maintain the internal and external value of the currency and to hold all or part of the international reserves of the country*' (para. 2.72, ESA2010).

Essentially, there is no difference between the above two definitions. Moreover, both definitions indicate clearly that the central bank should be allocated to the financial corporations sector (S.12), even if the majority of its output is of nonmarket characteristic.[4]

While enjoying a large degree of autonomy or independence with respect to exercising its main activity, such as the monetary policy, the central bank's activities are usually subject to specific legal provisions and under the general control and supervision of national government. Normally, the central bank, if it can be identified as a separate institutional unit, is supposed to be allocated to the general government sector (S.13).

However, due to the analytical importance attached to obtaining accounts covering the monetary authorities in its entirety, and in order to provide links with other statistical systems, such as Balance of Payments Manual (BPM), Government Finance Statistics Manual (GFSM), and Monetary and Financial Statistics Manual (MFSM), the central bank, by convention, is allocated in the financial corporations sector (S.12) as a public corporation. This is the single exception to the general rule that a unit whose output is primarily non-market is not to be classified as a corporation.[5]

[3] Though not an EU member country, Norway is legally obliged to submit required statistics to Eurostat in accordance with the ESA 2010 regulations, which is stipulated by the European Economic Area (EEA)-agreement.
[4] The ESA 2010 provides for a separate subsector (S.1315) for "European institutions and bodies". The European Central Bank (ECB) is nevertheless classified as part of the "central bank" subsector (S.121) when compiling European accounts. When compiling national accounts for the separate member states of the EU, the ECB is part of the rest of the world sector.
[5] See, for example, Diagram 2.1- Allocation of units to sectors in the ESA 2010 (Eurostat, 2013).

As a result, the public sector within the national accounting framework is divided into the general government sector as one subsector (S.13), and all public corporations as the other subsector. The public corporation's subsector is further divided into three parts: non-financial public corporations, financial public corporations other than the central bank, and the central bank (S.121) by its own.

2.2. Output of the central bank

In the 2008 SNA, the output of the central bank consists of three broad groups of services, namely financial intermediation, monetary policy services, and supervisory services overseeing financial corporations. '*Financial intermediation services represent market production, monetary policy services represent non-market production and borderline cases, such as supervisory services, may be treated as market or non-market services depending on whether explicit fees are charged that are sufficient to cover the costs of providing such services or not*' (para. A3.28, 2008 SNA).

In principle, separate establishments should be identified as much as possible for units of the central bank undertaking production of these different services to facilitate the distinction between the market and nonmarket output of the central bank, '*but in practice the possible resource intensiveness of the exercise and the relative importance of making the distinction should be considered before implementing the conceptual recommendations. In cases where market output is not separated from non-market output, the whole of the output of the central bank should be treated as non-market and valued at the sum of costs*' (para. 6.152, 2008 SNA).

As regards the output of the central bank, the ESA 2010 gives almost the same definition as in the 2008 SNA: '*The central bank delivers the following services: (a) monetary policy services; (b) financial intermediation services; (c) supervisory services overseeing financial corporations*' (para. 3.63, ESA 2010).

In addition, '*The output of the central bank is, by convention, to be measured as the sum of costs, i.e., its intermediate consumption, compensation of employees, consumption of fixed capital and other taxes less subsidies on production. FISIM do not have to be calculated for the central bank*' (para. 14.16, ESA 2010).

2.3. Allocation of the central bank output to users

There are differences between the 2008 SNA and the ESA 2010 regarding how to allocate the central bank output to different users.

The general guidance provided by the 2008 SNA is '*that non-market activities are to be regarded as acquisition of collective services by general government with a matching transfer from the central bank to the government, so there is no net cost to the government for these services. Market output is provided on an individual basis to all sectors of the economy against payment for the services*' (para. A3.29, 2008 SNA).

The collective consumption represented by monetary policy services is considered as expenditure by general government, but government does not bear the costs incurred by the central bank. Thus, a current transfer representing the value of the non-market output should be recorded as payable by the central bank and receivable by the general government to cover the purchase of the non-market output of the central bank by government in the secondary distribution of income account.[6]

As for the individual market output of the central bank, if the financial intermediation services provided by the central bank are significant, and if it is possible and worthwhile to compile data for a

[6] This item may also include transfers between the central bank and government that are recorded when the central bank charges interest at a rate that is out of line with market rates for policy purposes. The recording in such cases is described in paragraphs 7.122 to 7.126 in the 2008 SNA but is not the focus of this document.

separate establishment providing them, these services should be shown as payable by the units to whom they are delivered. Supervisory services treated as market output are recorded similarly.

As for the allocation of the central bank output to different users, the ESA 2010 is more specific in this regard:

'*Commissions and fees for directly measured services invoiced by the central bank both in respect of resident and non-resident units should be allocated to these units.*

Only the part of the total central bank output (sum of costs less commissions and fees) which is not sold has to be, by convention, allocated to the intermediate consumption of other FIs — subsectors S.122 (deposit-taking corporations except the central bank) and S.125 (other financial intermediaries, except insurance corporations and pension funds) — in proportion to the respective value added of each of these subsectors.

To equilibrate the accounts of subsectors S.122 and S.125, the amount of their respective intermediate consumption of the service provided by the central bank is to be counterbalanced by a current transfer (classified under D.759 'other miscellaneous current transfers') received from the central bank, for the same amount' (para. 14.16, ESA 2010).

Clearly, one distinction between the 2008 SNA and the ESA2010 is that the current transfer representing the value of the central bank non-market output is suggested to be recorded in the secondary distribution of income account as receivable by the general government (S.13) as final consumption (P.3) according to the 2008 SNA, while as receivable by subsectors S.122 and S.125 as intermediate consumption (P.2) according to the ESA 2010.

Recall that it is the ESA 2010 that the NNA is legally obliged to respect to. In the next section, the current practice for recording the output of the Norwegian central bank (Norges Bank) in the NNA will be investigated by using the ESA 2010 as the ultimate criterion.

3. The Norwegian central bank

The Norwegian central bank is called Norges Bank. As a central bank, the principal mission of Norges Bank is to promote economic stability in Norway by means of monetary policy and other measures. In addition, Norges Bank also manages the Norwegian Government Pension Fund Global (GPFG) and the bank's own foreign exchange reserves as its important tasks.

The GPFG fund was created as a tool for managing the large state revenues stemming from petroleum production in the North Sea. Following legislation passed by the Norwegian Parliament, the GPFG fund was set up in 1990 with the purpose of shielding the Norwegian fiscal budget from ups and downs in oil revenue due to price volatility in the international oil and gas market.[7] The first transfer to the GPFG fund took place in 1996. The fund also serves as a financial reserve and as a long-term savings plan so that both current and future generations get to benefit from the oil wealth. Over the years, the GPFG fund has now become one of the largest sovereign wealth funds in the world. For instance, at the end of 2021, the GPFG fund had a market value of NOK 12 340 billion (Norges Bank Investment Management, 2022).

Entering the 21st century, a fiscal rule (*Handlingsregelen* in *Norwegian*) was introduced in Norway, stipulating that government income (through tax and other direct involvements) from crude oil and natural gas go directly into the GPFG fund, from which only a maximum of 4% of the fund's value can be allocated to the government budget each year [8] (Norwegian Ministry of Finance, 2000). Recently, the fiscal rule of 4% was replaced by a more stringent 3% rule (Norwegian Ministry of Finance, 2017).

Recognizing the vital importance of the GPFG fund to the Norwegian economy, both for now and for the future, formally, Norges Bank Investment Management (NBIM) within Norges Bank's organisation is assigned for being responsible for operational management of the GPFG fund, ruled legally under the Norges Bank Act (*Sentralbankloven* in *Norwegian*), which also governs the division of responsibilities between Norges Bank and the Ministry of Finance with regard to the general management of the GPFG fund.

Income generated for the NBIM by providing consultancy and other services for managing the GPFG fund is reported as 'Management fee, GPFG' in the income statement of Norges Bank's annual report (e.g., Norges Bank, 2022), as well as in the Public Accounting Report from Banks and Financial Enterprises [9].

Moreover, the equivalent expenditure is also shown in the Norwegian Government Accounts. However, the associated management services giving rise to such income are currently not registered visibly as (part of) Norges Bank's output in the NNA. In 2019, the 'Management fee, GPFG' was valued as NOK 4132 million in current prices, accounting for approximately 84% of the total Norges Bank's output recorded in the NNA.

[7] To avoid the so-called 'Dutch disease', the GPFG fund is only allowed to be invested into global capital market, which is a necessary condition for reaching sustainability for a resource-rich country like Norway (see e.g., Liu, 2013, 2016).
[8] The 4% set by Norwegian Ministry of Finance refers to an expected long-term real rate of return to the GPFG.
[9] *Offentlig regnskapsrapportering fra banker og finansieringsforetak (ORBOF)*, in *Norwegian*.

4. The current method for recording the central bank in the NNA

4.1. Definition and classification of the central bank

According to the grouping standard for products, supply, and uses that is applied in the compilation of the real national accounts within the NNA (see Amdal and Sagelvmo, 2022), the Norwegian central bank, i.e., Norges Bank, has the code and activity defined as:

Code: 23641

Activity: Central banking *(Sentralbankvirksomhet* in *Norwegian*).

In the sector accounts of the NNA, Norges Bank is classified as a subsector, coded as S.121, under the aggregate 'Financial corporations sector' (S.12).

In the real national accounts of the NNA, the two digits of '22-26' are employed as the prefix of the codes for production accounts for different activity (industry) groups. The classification for activities (industries) in the real national accounts is an aggregated version of NACE rev.2, specifying about 150 industries, which are grouped under the production accounts divided among '22. Producers for own final use'; '23. Market producers'; '24. Producers of central government services'; '25. Producers of local government services'; and '26. Non-profit institutions serving households (NPISHs)'.

Table 1. Correspondence between selected industries and subsectors in the NNA

Description	Code of industry in real national accounts	Code of subsector in sector accounts
Central banking	23641	S.121
Other monetary intermediation [a]	23642	S.122
Other financial intermediation [b]	23649	S.125
Services auxiliary to financial intermediation [c]	23660	S.126 [e]
Central government administration, including social security [d]	24841	S.1313

Source: Statistics Norway
Notes:
a - *Bankvirksomhet ellers* in *Norwegian*.
b - *Annen finansiell tjenesteyting* in *Norwegian*.
c - *Tjenester tilknyttet finansierings- og forsikringsvirksomhet* in *Norwegian*.
d - *Offentlig administrasjon, sosialforsikring* in *Norwegian*.
e - In practice, a small part of institutional units within S.126 is allocated to S.125.

By subdividing the real national accounts based on the SUTs into the production accounts for 'own final use', 'market producers', and 'other non-market producers', a crucial linkage can be established between the real national accounts and the production accounts in the institutional sector accounts, based on which the correspondence between industries and subsectors in concern can be identified. For instance, Table 1 presents such a correspondence for some selected industries and subsectors that are focus of this document.

In the NNA, Norges Bank is *de facto* treated as 'Nonmarket producer' with its net operating surplus being set equal to zero, [10] which is in line with the international standards. However, Norges Bank is currently coded as '23641', meaning literally as a 'Market producer' in the real national accounts, which is not in accordance with the international standards in a strict sense.

[10] Strictly speaking, 'Net operating surplus being zero' is just a necessary condition for an institutional unit to be treated as nonmarket producers providing nonmarket output, it is not a sufficient condition.

Nonetheless, given that the code of '23641' has been conventionally used for a long time in the NNA and that Norges Bank does provide some market services as illustrated in Section 3, as a compromise, Norges Bank may still be coded as '23641' (rather than '24641' as it is supposed to be) in the real national accounts, and as 'S.121' in the sector accounts, but it should be clearly acknowledged that Norges Bank is a 'Nonmarket producer' as a whole.

4.2. Output of the central bank

Table 2 is a simplified supply table with only one industry/subsector, namely Norges Bank (coded as 23641/S.121), being presented. As shown, Norges Bank produced three products: 641100 (central banking, paid services), 000387 (own account investment in R&D), and 720000 (R&D product for investment). In 2019, the product 641100 accounted for 99.5% (NOK 5134 million), while the rest two products (000387 and 720000) combined accounted for only 0.5% (NOK 26 million), of the total production which was calculated as the sum of costs and was valued as NOK 5160 million in current prices in 2019.

Table 2. Output of the central bank 23641/S.121, current prices (NOK million), 2019

Product	Description	Supply Industry/Subsector	Output at basic prices
000387	Own account R&D investment [a]	23641/S.121	22
720000	R&D product for investment [b]	23641/S.121	4
641100	Central banking, paid services [c]	23641/S.121	5134
Sum			5160

Source: T1_HR2019_2019 from Golden database in Statistics Norway
Notes:
a - *Egne investeringsarbeider, forskning og utvikling (FoU)* in *Norwegian*.
b - *Forskning og utvikling (leveres kun til investering)* in *Norwegian*.
c - *Sentralbankvirksomhet, betalt tjenester* in *Norwegian*.

It is in line with the international standards that as a nonmarket producer, Norges Bank's total output was valued at the sum of costs. However, the product 641100 is currently called 'Central banking, paid services' in the product grouping standard in the NNA. This is not correct.

As a matter of fact, this product 641100 should be considered as 'nonmarket collective services' without payment incurred, rather than 'paid services', or even more precisely, it should be considered as 'nonmarket club services', because, as shown later, the product 641100 was without charge used exclusively and exhaustively by other financial intermediaries, but not by the whole economy at large.

As mentioned in Section 3, in addition to implementing monetary policy, Norges Bank also provides management services to the GPFG fund, which should have been counted in as part of Norges Bank's total output. As a matter of fact, NOK 4312 million was registered in 2019 as 'Management fee, GPFG' [11] in the income statement of Norges Bank's annual report (Norges Bank, 2020), as well as in the Public Accounting Report from Banks and Financial Enterprises [12] as item 'Management fee from concern' [13]. While in the Norwegian Government Accounts, the equivalent value was registered as item 'Office- and consultancy services etc.[14].

Therefore, a new product with the value of NOK 4312 million has been introduced as part of Norges Bank's output in 2019. As a result, the value of product 641100 should be reduced accordingly with the same amount of NOK 4312 million, becoming NOK 822 million in current prices in 2019 as a residual.

[11] *Forvaltningsgodtgjøring Statens pensjonsfond utland* in *Norwegian*.
[12] *Offentlig regnskapsrapportering fra banker og finansieringsforetak (ORBOF)*, in *Norwegian*.
[13] *Forvaltningshonorarer fra konsernselskaper* in *Norwegian*.
[14] *Kontor- og konsulenttjenester mm* in *Norwegian*.

4.3. Allocation of the central bank output to users

Table 3 is a simplified Use table with only the product 641100 being reported.[15] As shown, the total product 641100 (NOK 5134 million) was used exclusively and exhaustively by the following three industries/subsectors in 2019: 23642/S.122, 23649/S.125, and 23660/S.126.

Table 3. Use of the central bank product 641100, current prices (NOK million), 2019

Product	Use Industry/Subsector	Input at purchasers' prices
641100	23642/S.122	1695
641100	23649/S.125	1686
641100	23660/S.126	1753
Sum		5134

Source: T2_HR2019_2019 from Golden database in Statistics Norway

As indicated implicitly by Table 3, the total product 641100 produced by industry/subsector 23641/S.121 in 2019 (NOK 5134 million) was used up only as intermediate consumptions by the three industries/subsectors as shown in Table 3, there was no final uses for this product reported in the NNA. Furthermore, the value of the product 641100 at basic prices (as output) was equal to that at purchasers' prices (as the sum of intermediate consumptions), implying that no tax/subsidy or trade or transport margins was involved in the valuation of the central bank output in the NNA.

Several inconsistencies are identified as regards the current practice in the NNA for allocating the central bank output to different users.

According to the ESA 2010, the nonmarket output from the central bank is supposed to be allocated to the intermediate consumption of subsectors S.122 and S.125 in proportion to the respective value added of each of the two subsectors. However, as shown in Table 3, the product 641100 was also allocated to the subsector S.126 (industry 23660) following the current practice.

The product 641100 was treated as 'paid services', but in fact, this is a nonmarket product and there is no cost for using it by other financial subsectors. Therefore, in the secondary distribution of income account within the sector accounts, a current transfer should have been registered as payable by the Norwegian central bank (23641/S.121) who actually bore the cost incurred, and as receivable by the respective subsectors (23642/S.122 and 23649/S.125) who *de facto* did not.

However, since no such a current transfer was registered in the secondary distribution of income account within the sector accounts in the NNA, the resources and uses of the involved industries/subsectors (23641/S.121, 23642/S.122, and 23649/S.125) were unbalanced, which, *ceteris paribus*, would lead to incorrect estimates for saving, and net lending/borrowing for each of the subsectors, although these estimates for the subsectors as a whole were still correct, for example, when a consolidated sector account was presented with only the aggregate 'Financial corporations sector' (S.12) being shown.

Upon the introduction of a new (market) product as part of Norges Bank's output (see Section 3 and comments in subsection 4.2), the use of this new product should also be determined, otherwise the supply of this new product will not be counterbalanced by the corresponding use in the SUTs.

[15] The other two products of Norges Bank's output, i.e., 000387 and 720000, are used for investment as final use, but they are not the focus of this document.

5. Updating the recording of the central bank output in the NNA

5.1. Changing the name of the product 641100

The first update is to change the name of the central bank product

641 100 Central banking, paid services *(Sentralbankvirksomhet, betalt tjenester* in *Norwegian*)

to

641 100 Central banking, nonpaid services *(Sentralbankvirksomhet, ikke-betalt tjenester* in *Norwegian*).

In addition, it needs to be acknowledged that the product '641 100 Central banking, nonpaid services' is nonmarket club services that are to be used, free of charge, as intermediate consumption only by the two industries/subsectors, i.e., 23642/S.122 and 23649/S.125.

5.2. Introducing a new market product 641109

As part of the central bank output, a new market product has been introduced as 'Management services to GPFG', which is *paid services*, and coded as 641109. Data source for the value of this new market product 641109 can be drawn from Norges Bank's annual report, the Public Accounting Report from Banks and Financial Enterprises, and the Norwegian Government Accounts.

There are different views regarding whether the introduced product 641109 should be considered as market (vs. nonmarket) product. Some argue that there is no competitive market for such 'Management services to GPFG' provided by Norges Bank, while others argue that NBIM within Norges Bank gets paid in line with the market prices by providing such services which could also be bought from the market. For our purpose, this document will not further dwell on this issue and simply calls the new product 641109 as a *market* product.

Using 2019 as an example, Table 4 presents an updated output table of the central bank (23641/S.121). Compared with Table 2, Table 4 shows that among the updated output, the new market product 641109, with the value of NOK 4312 million, accounted for the largest part (84%), while the nonmarket product 641100, with the updated value of NOK 822 million, accounted for only about 16%, of the total central bank output in 2019.

Table 4. Updated output of the central bank 23641/S.121, current prices (NOK million), 2019

Product	Description	Supply Industry/Subsector	Output at basic prices
000387	Own account R&D investment [a]	23641/S.121	22
720000	R&D product for investment [b]	23641/S.121	4
641100	Central banking, nonpaid services [c]	23641/S.121	822
641109	Management services to GPFG [d]	23641/S.121	4312
Sum			5160

Source: Authors' own calculations.

Notes:

a - *Egne investeringsarbeider, forskning og utvikling (FoU)* in *Norwegian*.

b - *Forskning og utvikling (leveres kun til investering)* in *Norwegian*.

c - *Sentralbankvirksomhet, ikke-betalt tjenester* in *Norwegian*.

d - *Tjenester tilknyttet SPU* in *Norwegian*.

Recall that the value of the total output of the central bank in 2019 was still NOK 5160 million, regardless of the introduction of the new market product 641109, because this value was calculated from input side as the sum of the total costs. Therefore, the introduction of the new market product 641109 is essentially a redistribution of the total output among products, with the total output remained the same as before the updating.

5.3. Allocating the nonmarket product 641100 to users

According to ESA 2010, after commissions and fees being deducted from the total output, the central bank's nonmarket output (product 641100) should only be allocated to subsectors S.122 (industry 23642) and S.125 (industry 23649), but not to subsector S.126 (industry 23660).

For updating the allocation, first, intermediate consumption excluding the nonmarket product 641100 should be derived in order to generate the corresponding 'Gross value added without 641100 as intermediate consumption' for each user industry/subsector. Based on the final annual national accounts data for 2019, the results are estimated and presented in Table 5, which is a simplified production account for the three user industries/subsectors (i.e., 23642/S.122, 23649/S.125, and 23660/S.126) in 2019.

Table 5. Production account without the nonmarket product 641100 as intermediate consumption, current prices (NOK million), 2019

	Industry/Subsector 23642/S.122	Industry/Subsector 23649/S.125	Industry/Subsector 23660/S.126
Output	120441	46854	29552
Intermediate consumption without 641100	28380	23009	12073
Gross value added without 641100 as intermediate consumption	92061	23845	17479

Source: Authors' own calculations.

Then, the updated nonmarket product 641100 (NOK 822 million, see Table 4) in 2019 is allocated to the two user industries/subsectors (i.e., 23642/S.122 and 23649/S.125), in proportion to their respective value added. For instance, for industry/subsector 23642/S.122, the value of the updated nonmarket product 641100 that is to be allocated to this industry/subsector is calculated as: 822 * 92061 / (92061+23845) = 653; while for industry/subsector 23649/S.125, the corresponding value is as: 822 * 23845 / (92061+23845) = 169. Note that no nonmarket product 641100 should be allocated to the industry/subsector 23660/S.126, in line with the recommendations by ESA2010. The updated results are shown in Table 6.

Table 6. Updated use of the central bank nonmarket product 641100, current prices (NOK million), 2019

Product	Use Industry/Subsector	Input at purchasers' prices
641100	23642/S.122	653
641100	23649/S.125	169
641100	23660/S.126	0
Sum		822

Source: Authors' own calculations.

Reallocating the nonmarket product 641100 to users as described above can be implemented in the final annual national accounts for the period 2000 to 2019 which were already finalized. However, when implementing the allocation for the ongoing 2020 final annual national accounts, a technical issue appeared, i.e., 'intermediate consumption without 641100', and thus 'Gross value added without 641100 as intermediate consumption' as shown in Table 5 were not readily available before separately calculated FISIM and R&D were in place. Such a technical issue in terms of calculation sequence is rooted in the compilation system, therefore, other alternative allocation methods should be considered. For example, instead of using 'gross value added' as the allocation key, part of intermediate consumption can serve as a proxy. More experiments are needed in the future.

Being nonmarket club services, the nonmarket product 641100 is used free of charge by club members, therefore, a current transfer should be registered as payable by Norges Bank (23641/S.121) who actually bore the cost incurred, and as receivable by the respective industries/subsectors (23642/S.122 and 23649/S.125) who used it but did not incur any cost. Otherwise, some important indicators for the relevant industries/subsectors (i.e., 23641/S.121, 23642/S.122, and 23649/S.125) will be estimated with bias.

Table 7. Updated part of secondary distribution of income account for subsectors S.121, S.122, and S.125 (NOK million), 2019

	Uses			Resources		
	S.121	S.122	S.125	S.121	S.122	S.125
D.759 Other miscellaneous current transfers						
Central banking, nonpaid services	822				653	169

Source: Authors' own calculations.

As shown in Table 7, in the secondary distribution of income account within the sector accounts in the NNA, a current transfer representing the value of Norges Bank's nonmarket product 641100 is registered under D.759 (A34398[16]) 'other miscellaneous current transfers' in 2019, as payable by Norges Bank, i.e., industry/subsector 23641/S.121 (NOK 822 million), and as receivable by industries/subsectors 23642/S.122 (NOK 653 million) and 23649/S.125 (NOK 169 million), respectively.

5.4. Allocating the new market product 641109 to users

The new market product 641109 (Management services to GPFG) is supposed to be used only by the industry/subsector 24841/S.1313 (Central government administration, including social security) as intermediate consumption, which is then counted in as part of the total production of central government administration, and finally as part of general government final consumption.

The reason is that general government is nonmarket producer, and its nonmarket output is calculated as the sum of costs including intermediate consumption. Furthermore, this nonmarket output is also conventionally treated as consumed by government itself in the national accounting system (United Nations, 2009; Eurostat, 2013).

Information drawn from the Government Finance Statistics (GFS) indicate that the intermediate consumption of central government administration as previously registered in the NNA has already incorporated the management services provided by Norges Bank to the GPFG fund, therefore, the introduced product 641109 will substitute in value part of the previously registered intermediate consumption of central government administration with the same amount.

In order to re-balance the SUTs, due caution should be taken. As shown, an aggregate technical account in the SUTs uses a variety of normal NNA products [17]and supplies only one unspecified intermediate product, coded as '000031', which is defined as 'Post, telecommunication, internet, accounting, IT, advertising, legal advice, consultancy, and other business services'. In 2019, central government administration (24841/S.1313) used NOK 9304 million of the product 000031 within its total intermediate consumption.

The update implies that the introduction of the new market product 641109 with amount of NOK 4312 million in 2019 would reduce the value of the product 000031 with exactly the same amount. To balance the aggregate account that generates the product 000031, the amount of the normal NNA products absorbed by the aggregate account is reduced with, again, the same amount (i.e., NOK 4312 million in 2019). However, since the total supply (production + import) of these relevant normal NNA products in concern are better not be changed in the SUTs, the reduced amount has to be counterbalanced by the corresponding increase of inventory of these normal NNA products in the SUTs (i.e., NOK 4312 million in 2019 in total).

[16] A34398 is the code for this specific transaction used in the Norwegian institutional sector accounts.
[17] There are about 900 normal NNA products in the SUTs, which are classified based on the CPA (see Liu and Steinar, 2022).

6. Impacts on the NNA due to the updating

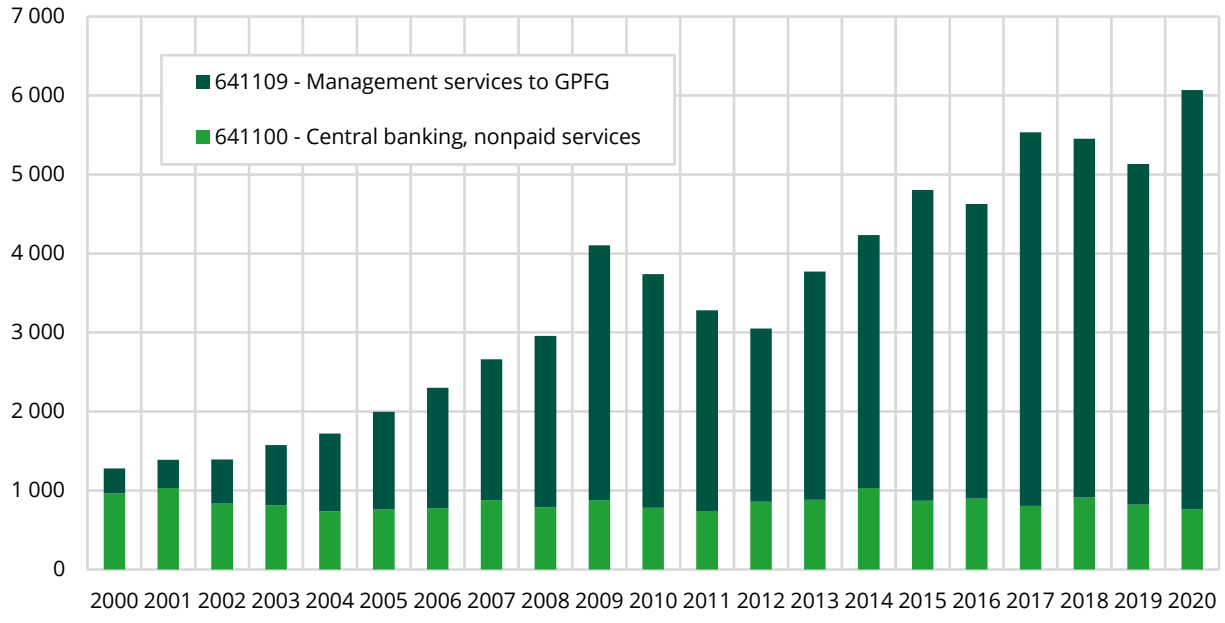
6.1. Impact on the distribution of the central bank output

Figure 1 displays the updated estimates of the central bank's two products over the period 2000-2020 in current prices, namely, 641100 (Central banking, nonpaid services) as a nonmarket product, and 641109 (Management services to GPFG) as a market product.

The value sum of products 641100 and 641109 as shown in Figure 1 is the same as the 'before-updating' value of the product 641100 as previously registered in the final annual national accounts up to 2019. As mentioned, the impact of the introduction of the new market product 641109 is just a redistribution of the 'before-updating' total value of 641100 between the two updated products (641100 and 641109).

As visualized in Figure 1, the value of the nonmarket product 641100 (Central banking, nonpaid services) in current prices had been roughly the same over the observed period 2000-2020, around NOK 1 billion, while the value of the market product 641109 (Management services to GPFG) had been increasing, which was positively correlated with the market value development of the GPFG over the same period 2000-2020.[18]

Figure 1. Updated Norges Bank's output: 641100 and 641109, current prices (NOK million), 2000-2020



Source: Authors' own calculations.

We conclude that splitting the 'before-updating' value of the product 641100 into two updated products: 641100 as a nonmarket product, and 641109 as a market product, as suggested in this document, is reasonable.

[18] See https://www.regjeringen.no/en/topics/the-economy/the-government-pension-fund/government-pension-fund-global-gpfg/market-value-and-capital-inflow/id696852/.

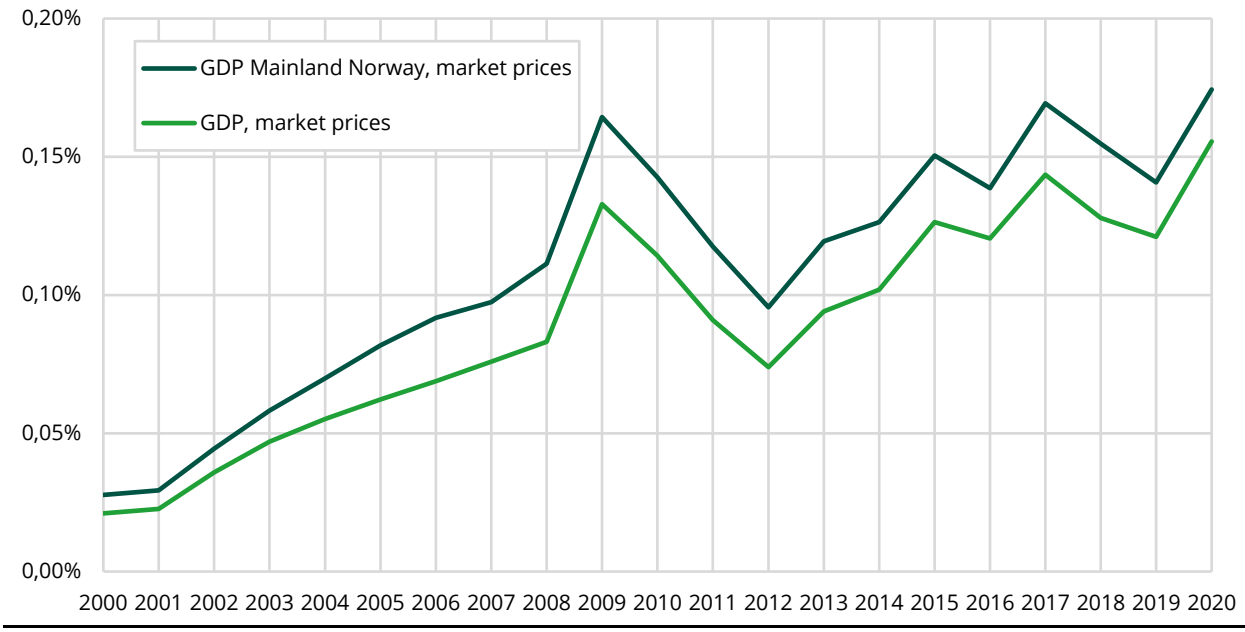
6.2. Impact on GDP and Gross Capital Formation (GCF)

In general, three approaches are available for measuring GDP: the production approach, the expenditure approach, and the income approach. When considering the impact due to the updating as suggested in this document, the first two approaches are relevant here.

Based on the production approach, other things being unchanged, the updating has led to the total value added of the three industries/subsectors, namely, 23642/S.122, 23649/S.125, and 23660/S.126 being enhanced, because their intermediate consumptions are reduced with the amount equal to that of the new market product 641109 (Management services to GPFG).

By means of the expenditure approach, other things being equal, the updating has resulted in the increase of inventory with the value, again, equal to that of the new market product 641109 (Management services to GPFG).

Figure 2. Percentage changes of GDP due to updating, 2000-2020



Source: Authors' own calculations.

Figure 2 presents the percentage changes of GDP due to the updating over the period 2000-2020. As shown, the percentage changes for GDP at market prices, both for the whole Norwegian economy and for the Mainland Norway only, though slightly increasing, had been under 0.2% over the entire period 2000-2020.

6.3. Impact on the real national accounts for the relevant industries/sectors

Using 2019 as an example, Table 8 provides a compact combination of 'before-updating' production and generation of income accounts for five industries/subsectors that are in concern of this document: 23641/S.121 (Central banking), 23642/S.122 (Other monetary intermediation), 23649/S.125 (Other financial intermediation), 23660/S.126 (Services auxiliary to financial intermediation), and 24841/S.1313 (Central government administration, including social security).

For our purpose, the products of both nonmarket 641100 and market 641109 are specifically highlighted in Table 8 as '*of which*' items within the items of both 'Output' and 'Intermediate consumption'.

Being a simplified table, Table 8 does not show separately resources, uses, and the corresponding balancing items in either production or generation of income account. However, it is well-known that in a production account, one has the following identity:

> Gross value added (as a balancing item) = Output (as resources) – Intermediate consumption (as uses),

while in a generation of income account, the following identities hold:

Gross operating surplus (as a balancing item) = Gross value added (as resources) - Compensation of employees (as uses) – (Other taxes on production - Other subsidies on production) (as uses).

In addition, net items can be derived from gross items as shown in Table 8 by deducting consumption of capital, for instance,

> Net value added = Gross value added - Consumption of capital,

> Net operating surplus = Gross operating surplus - Consumption of capital.

Table 8. Production and generation of income accounts, current prices (NOK million), 2019

	Industry/Subsector 23641/S.121	Industry/Subsector 23642/S.122	Industry/Subsector 23649/S.125	Industry/Subsector 23660/S.126	Industry/Subsector 24841/S.1313
Output	5160	120441	46854	29552	149507
of which, 641100	*5134*	-	-	-	-
of which, 641109	-	-	-	-	-
Intermediate consumption	3255	30075	24695	13826	56928
of which, 641100	-	*1695*	*1686*	*1753*	-
of which, 641109	-	-	-	-	-
Gross value added	1905	90366	22159	15726	92579
Compensation of employees	1699	24231	4169	9824	74142
Other taxes on production	-	1098	121	365	21
Other subsidies on production	-	73	1300	125	-
Gross operating surplus	206	65110	19169	5662	18416
Consumption of capital	206	3286	1779	641	18416
Net operating surplus	0	61824	17390	5021	0

Source: T1_HR2019_2019, T2_HR2019_2019, T3L_HR2019_2019 from Golden database in Statistics Norway
Note: '-' stands for 'Not Available'.

Table 9 presents a 'after-updating' accounts with the same format as shown in Table 8. For the ease of comparison, all the updated figures are shown in red colour in Table 9.

Compared to the 'before-updating' scenario (Table 8), Table 9 shows that for the industry/subsector 23641/S.121, the only change due to the updating is the redistribution of its output among the two products: the nonmarket product 641100 and the market product 641109, exactly as described in subsection 6.1; for the three other industries/subsectors, i.e., 23642/S.122, 23649/S.125, and 23660/S.126, with no changes observed for output, their intermediate consumptions reduced owing to the reduced amount of the nonmarket product 641100, ending up with increased gross value added, as well as increased gross and net operating surplus.

Table 9. Updated production and generation of income accounts, current prices (NOK millions), 2019

	Industry/Subsector 23641/S.121	Industry/Subsector 23642/S.122	Industry/Subsector 23649/S.125	Industry/Subsector 23660/S.126	Industry/Subsector 24841/S.1313
Output	5160	120441	46854	29552	149507
of which, 641100	*822*	-	-	-	-
of which, 641109	*4312*	-	-	-	-
Intermediate consumption	3255	29033	23178	12073	56928
of which, 641100	-	*653*	*169*	*0*	-
of which, 641109	-	-	-	-	*4312*
Gross value added	1905	91408	23676	17479	92579
Compensation of employees	1699	24231	4169	9824	74142
Other taxes on production	-	1098	121	365	21
Other subsidies on production	-	73	1300	125	-
Gross operating surplus	206	66152	20686	7415	18416
Consumption of capital	206	3286	1779	641	18416
Net operating surplus	0	62866	18907	6774	0

Source: Authors' own calculations.
Note: '-' stands for 'Not Available'.

As for the industry/subsector 24841/S.1313, the only change due to updating is that intermediate consumption now includes the product 641109 with the amount of NOK 4312 million in 2019., but the total value of intermediate consumption does not change, because the new product 641109 replaces exactly the same amount of other products that have been used as intermediate consumption by the industry/subsector 24841/S.1313. As a result, there are no changes for all the other items for this industry/subsector in the table (such as output, gross value added, etc.).

6.4. Impact on the institutional national accounts for the relevant industries/sectors

In the secondary distribution of income account, as described in subsection 5.3, a current transfer representing the value of Norges Bank's nonmarket product 641100 should be registered under D.759 'other miscellaneous current transfers', as payable by Norges Bank (23641/S.121), and as receivable only by industries/subsectors 23642/S.122 and 23649/S.125, respectively. There is no change at all for industry/subsector 23660/S.126.

Compared to the 'before-updating' scenario, some important economic indicators such as saving and net lending/borrowing will increase for the two industries/subsectors 23642/S.122 and 23649/S.125, while decrease for the industry/subsector 23641/S.121. However, for the aggregate 'Financial corporations sector' (S.12) in its entirety, there is no change, meaning that the decrease of the relevant indicators in 23641/S.121 is equal in value to the sum of the increase of those same indicators in 23642/S.122 and 23649/S.125.

7. Concluding remarks

Several inconsistencies are identified between the previous practice applied in Statistics Norway and the international standards as regards the treatment of the central bank in national accounts. Benchmarking to the international standards, this document presents the updated procedure for recording the Norwegian central bank in both the SUTs and the institutional sector accounts in the NNA.

A new market product representing 'Management services to GPFG' is introduced in the central bank's output with the previously existed nonmarket product of 'Central banking, nonpaid services' reduced with the same amount in value. An increased 'Management services to GPFG' over years is found to be positively correlated with the market value development of the GPFG fund over the period 2000-2020, which makes sense.

The central bank nonmarket output is allocated to S.122 and S.125 as intermediate consumption in the SUTs, and the respective values are registered as current transfers in the institutional sector accounts. The introduction of the new central bank market output leads to an augment of inventory. As a result, GDP increases with the same amount as the value of the new market product.

However, the impact on GDP due to the updating is not very significant, with the percentage changes for GDP at market prices, both for the whole Norwegian economy and for the Mainland Norway, being under 0.2% over the period 2000-2020. Nonetheless, the diverse impacts on other important economic indicators, specifically for the relevant industries/subsectors as concerned in the document, should be acknowledged.

The updated procedure as presented in this document serves as a first step towards a betterment of recording the central bank output in the NNA. There are other issues to be explored in the future. For instance, the costs associated with managing properties are currently not counted within the 'Management services to GPFG' in Norges Bank but are registered in the institutional sector accounts as an import of services included in the total management costs by Noges Bank and used by the subsector S.1313, but however not visibly via and directly linked to Norges Bank.

Up to now, the new introduced central bank market product ('Management services to GPFG') has been treated as simply used by the general government (S.13), which is part of the total economy (S.1). As a matter of fact, several local offices of the GPFG (such as those in London, New York, Singapore, and Shanghai) are in the 'Rest of the world' (S.2). Therefore, recording in a more appropriate way the 'Management services to GPFG' as well as the subsequent impact on external and Balance of Payment accounts, though beyond the focus of this document, should be taken into consideration in future research.

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