

Inter-secretariat Working Group on National Accounts

FOR GLOBAL CONSULTATION

Global consultation on the guidelines for estimating the net return to capital for non-market production

Guidelines for estimating the net return to capital for non-market production¹

Introduction

1 At its 10-12 July 2023 meeting, the Advisory Expert Group (AEG) on National Accounts (AEG) supported a range of recommendations to improve the consistency in the measurement of output when using the sum of cost approach in the 2025 SNA, including to incorporate a net return to capital² in the sum of costs approach for non-market producers. This followed on from a discussion of this issue at the March 2023 AEG meeting and subsequent global consultation which supported including a net rate of return for non-market production.

2 The meeting stressed the need to develop practical guidance on calculating the net rate of return to use in estimating non-market output to facilitate the implementation of the recommendations and particularly to ensure internationally comparable results.

3 The recommendations for improving the consistency in measurement using the sum of costs approach, including the incorporation of a net rate of return for non-market producers, were included in the list of recommendations for changes to the SNA that were endorsed by the United Nations Statistical Commission at its meeting 55th session.³ The Commission stressed the importance of continuing to develop implementation guidance on the new recommendations generally to facilitate the implementation of the 2025 SNA in an internationally comparable way.

4 This paper proposes recommendations for calculating the net rate of return for use in the estimation of non-market production. A previous version of this paper was discussed at the AEG meeting held during October 2024, and feedback from the discussion is reflected in the current version. Following global consultation, the paper will be finalised for endorsement of the AEG and then submission to the 56th session of the Statistical Commission as a background paper.⁴

5 By definition, the net return to capital for non-market production is equal to the rate of return to capital multiplied by the value of non-financial assets used in production. It is important to establish guidelines for estimating the rate of return to capital for non-market producers, as this is new in the 2025 SNA. Therefore, the initial focus of this paper is on determining an appropriate rate of return to capital for non-market producers. The value of nonfinancial assets used in production comes from balance sheets and do not present new issues

¹ This Paper was prepared by Peter Harper (Project Manager for the Update of the 2008 SNA) with grateful assistance from Bram Edens, David Bailey, Nicola Massarelli, Herman Smith, Erich Strassner, Peter van de Ven, Catherine van Rompaey John Verrinder, and Jorrit Zwijneburg. However, any errors or omissions remaining in this paper are the responsibility of the author.

 $^{^{\}rm 2}$ The term 'net return to capital' is used in preference to 'return to capital' to make it clear that depreciation/depletion is excluded.

³ The 55th session was held from 27 February and 1 March 2024.

 $^{^4}$ The 56th session is scheduled to be held from 4 to 7 March 2025

from a conceptual perspective. However, although balance sheets are part of the sequence of economic accounts, they are not produced by all countries. This has practical consequences which are discussed below.

6 Including a net return to capital in the sum of cost approach for estimating non-market output increases the value of production for non-market entities. However, it does not impact net lending/borrowing, as the increase in the value of production is offset by a concomitant increase in the final consumption expenditure or capital formation for the affected sectors.⁵ Appendix A provides the full sequence of accounts for measuring non-market production when using the sum of costs approach, including a net return to capital, and a discussion of the results.

Overview of potentially relevant documents

7 There is a range of documents regarding rates of return to capital. Most of these relate to market producers, although some documents specifically address the rate of return for government, or the closely related topic of determining an appropriate discount rate for government. While 'rates of return' and 'discount rates' are used for different purposes, in financial economics they both essentially relate to the opportunity cost of capital and therefore the similar issues arise when considering appropriate rates for each of them.

8 Some documents that are considered particularly relevant are described below.

OECD Measuring Capital

9 The OECD's *Measuring Capital* Manual (2009) directly addresses the issue of measuring the rate of return for the government sector.⁶ It suggests three possibilities:

- A measure that combines the rate of return used for the market sector, which could be an ex-post or ex-ante rate, and an explicit or implicit rate of return associated with owner-occupied housing.⁷
- A measure based on the financing costs of government projects. In this regard, the Manual notes: "it may be appropriate to use a smoothed series of government bond rates of different maturities where the latter could be chosen in accordance with the structure of government assets."
- A measure that identifies the government rate of return with the household rate of return, with the latter measured as the social rate of time preference (SRTP). The SRTP is a measure of society's willingness to postpone private consumption now in order to consume later. It is not directly observable and requires the use of parameters which are also not observable. The Manual provides a table showing estimates for OECD countries

⁵ In the case of non-market output produced for final consumption expenditure the inclusion of the return to capital does not impact on net or gross saving either, but in the case of non-market output produced for own account capital formation, it does.

⁶ *Measuring Capital* is based on the 2008 SNA, which did not include a net return of capital in the calculation of the value of output for non-market producers. However, the Manual considered that making such an estimate would be useful from an analytical perspective.

⁷ For EU countries, there is specific guidance for determining the rate of return for owner-occupied housing.

using different values for the parameters. Based on the Manual's preferred parameter combination, and average SRTP of 2.6% is generated for OECD countries covering the period 1970-2005. It should be noted that this is a real rate of return. To obtain a nominal rate, an estimate for inflation would need to be added.

10 *Measuring Capital* does not make a recommendation.

International Public Sector Accounting Standards

11 The issue of discount rates for government arises in the application of International Public Sector Accounting Standards (IPSAS); most particularly in regard to IPSAS 39 – Employee Benefits. A rate is needed to discount post-employment benefit obligations (such as those associated with defined benefit pension schemes). In its *Basis for Conclusions for IPSAS 39*, the International Public Sector Accounting Standards Board (IPSASB) notes: "The IPSASB considered that the time value of money may be best reflected by reference to market yields on government bonds, high quality corporate bonds, or any other financial instrument."

Eurostat Pension Guide

12 The issue of an appropriate discount rate to be used in estimating pension entitlements is also discussed in Eurostat's *Technical compilation guide for pension data in national accounts* (2020) – the *Pension Guide*. The *Pension Guide* notes:

For government-managed pension schemes, it is generally agreed that central government debt securities provide a suitable basis for the discount rate. Furthermore, the choice of the discount rate is ideally based on the following criteria:

1) In order to obtain a suitable proxy for a risk-free interest rate, it is advisable to base it not on central government debt securities of one single country but on a basket of e.g. European central government debt securities.

2) The maturity of these debt securities should be similar to that of pension entitlements, i.e. at least 10 years, but preferably longer.

3) In order to guarantee comparability across countries, the same discount rate should be applied to all EU countries and all government-managed pension schemes (including social security pension schemes) at whatever level of government.

4) A stable discount rate should be applied to avoid the noise resulting from frequent changes.

13 The *Pension Guide*, drawing on work by the EU Ageing Working Group of the Economy Policy Committee, recommends a real discount rate of two percent. The *Pension Guide* notes that the Ageing Working Group sets a nominal discount rate of four percent (two percent being the target inflation rate) as a standard rate for EU countries, with exceptions for a small number of countries with higher inflation targets.

IMF Working Paper Public versus Private Cost of Capital with State- Contingent Terminal Value

14 In more general literature, there is no agreed way of establishing a rate of return for government. An IMF Working Paper *Public versus Private Cost of Capital with State-Contingent Terminal Value* (2023) notes:

"There has been a long-standing dispute about the relative costs of public versus private finance. Many studies, including the influential paper by Arrow and Lind (1970), have suggested that the public costs are lower, providing different reasonings for this belief. On the other side of the discussion, Hirshleifer (1964) and several recent authors (Lucas, 2012; Engel, Fischer and Galetovic 2013) have argued that the argument is incorrect because, in efficient markets, investors can diversify risks on their own, a downwardly biased public discount rate can provide distorted incentives to the government, and governments can ultimately increase taxation to subsidize projects. Thus, even though the cost of government finance may be lower, the overall cost of capital to the ultimate principal—i.e., the public—could well be higher."

15 The Paper observes that different approaches are used in different countries to value government projects, with some countries using government bond rates and others using market-based costs of capital.⁸ The Paper concludes that "a lower public than private discount rate should be applied to the feasibility analysis of provision modes in public infrastructure and utilities."

Recommendations for the 2025 SNA

16 It is clear from the above that there is no definitive answer from literature as to what rate of return should be used to estimate the net return to capital for calculating the value of output for non-market producers. However, notwithstanding some differences of view, a rate of return based on, or consistent with, long-term government bond rates seems to be most appropriate for government non-market output at least. Such rates are generally observable and align with the opportunity cost for government associated with borrowing money to finance the assets used in production (and also leaving them with no profits after deducting borrowing costs).⁹

17 One question is should the bond rate be the bond rate(s) underlying the existing stock of government debt, or should it be the rate the government faces for new borrowing? As the net

⁸ In Australia, for example, the Department of Prime Minister and Cabinet's guidance note on *Cost-benefit analysis* (2020) advocates an annual real discount rate of seven percent, based on academic research undertaken by Australia's Productivity Commission in 2010. It should be noted that in Australia, and in some other countries, there is a strong view that government projects should use cost of capital rates similar to private projects to ensure an 'even' comparison between the two.

⁹ The proposed approach for calculating a rate of return for general government non-market output can be compared to the method proposed by the OECD Expert Group on Natural Capital for calculating a rate of return for estimating the value of natural resource assets using the net present value method. The Expert Group recommended using a rate calculated by dividing the net operating surplus of the whole of the economy minus the net operating surplus for the activities in scope, by the value of net fixed assets for the whole of the economy minus the net fixed assets of the activities in scope. This is an appropriate measure for 'for profit' activities', but it is not considered appropriate for 'not for profit' activities, which are likely to be subject to different costs of capital and therefore rates of return.

return to capital represents the opportunity cost for government in using capital in production, it is considered that the latter (i.e. the rate the government faces for new borrowing) is most appropriate conceptually.¹⁰

18 There can be a diversity of government bond rates observed across countries. Accordingly, a possibility would be to allow each country to calculate its own rate of return based on its own government borrowings. However, this approach might lead to arbitrary and possibly volatile results in some circumstances and would not promote international comparability. Instead, to enhance comparability across countries, it is considered that it is preferable to determine a default rate of return for general government that could be applied consistently across countries, with countries free to choose a different rate if there are compelling reasons to apply a different rate.

19 To determine a default rate, it is useful to develop criteria along the lines of those in Eurostat's *Pension Guide*. Accordingly, the following criteria are put forward:

1) In order to obtain a suitable default for the real rate of return for government, it is advisable to base it not on central government debt securities of one single country but to consider the experience across countries.

2) The maturity of these debt securities should be similar to the expected lives of the assets that are being used by the government in production, i.e. at least 10 years, but preferably longer.

3) A stable rate should be applied to avoid noise resulting from frequent changes.

4) The nominal rate should be calculated on the basis of the real rate plus the target inflation rate applicable in a country.

Taking these criteria into consideration, and based on analysis undertaken in the EU, it is recommended that a two percent be used as the default real rate of return for estimating the net return for government non-market output. However, where a country's real bond rate is persistently and significantly in excess of two percent, it is recommended that a real bond rate specific for that country be estimated.¹¹

As indicated in (5) above, the nominal rate would be equal to the real rate of return plus the country's target inflation rate. This would mean, for example, a nominal rate of return of four percent for countries with a target inflation rate of two percent, if the default real rate of return of two percent is used.

This recommendation is broadly consistent with paragraph 4.296 of the draft 2025 SNA. The last sentence in this paragraph states: "The latter approach [i.e. to use a rate based on the

¹⁰ Besides, while previous debt will have coupon interest payments that may differ from interest rates on new borrowings, in a properly functioning market the value of the bonds outstanding will change to ensure that the ex-post rates of return are equalized.

¹¹ This would be based on a smoothed series of government bond rates of different maturities and a smoothed measure of inflation.

interest rate paid for the borrowing of funds] would be preferable for non-market producers, who do not aspire to make profits."¹²

23 It is proposed that there be a regular review of the default real rate of return. The EU Working Group reviews its advice on the real discount rate very three years, although changes are less frequent.¹³ For SNA purposes, it proposed that the ISWGNA review the default rate periodically.

Several countries do not have target inflation rate. In these cases, a default rate of three percent could be used for these countries. (Using a three percent rate of inflation and the default real rate of two percent would give five percent as the default nominal rate of return for countries without an inflation target.) This could be justified on the basis that the 'ideal' rate of inflation is generally seen as being between two to three percent. An alternative would be to use a country's actual inflation rate; however, this could be volatile over time. Another alternative would be to use an average of the inflation rate over several years. While this would be more stable, it could be influenced by past periods of hyper-inflation that is no longer prevailing.

All things considered, to minimise volatility and maximise international comparability, it is recommended that a rate of three percent be used as a default for the inflation component of the nominal rate of return for countries without an inflation target¹⁴, with countries able to choose a different rate if it is considered that it is warranted in their particular circumstances.

26 It is acknowledged that for some countries using the default rates of return may produce conservative estimates (notwithstanding the option for a country to choose an alternative if it considered warranted in its circumstances). However, given the benefits of this approach in terms of stability and international comparability, as well as not running the risk of inadvertently overstating the rate of return, it is considered that such an approach is justified. Furthermore, as mentioned, a country can choose a different rate if this is considered more appropriate.

27 The general government is not the only sector that produces non-market output. Nonmarket output is also produced by the central bank and by non-profit institutions serving households (NPISHs).

For central banks (whose output is unlikely to be significant) it is proposed to use the same rate of return as for general government.

For NPISH's, as a pragmatic solution and in the absence of being able to identify anything more suitable, it is proposed to use as a real rate the rate of return for general government plus one percent.¹⁵ The target inflation rate would be added to get the nominal rate

¹² If the recommendations in this paper are accepted, this paragraph will need to be clarified.

 $^{^{\}rm 13}$ In approximately 15 years, there has only been one change.

¹⁴ For countries without an inflation target, using the higher value of two to three percent range seems justified.

¹⁵ For countries using the default real rate of return for general government of two percent, this would give a default real rate of return for NPISHs of three percent. This is similar to the average SRTP of 2.6 percent from the OECD's Measuring Capital, recognising that these calculations were made covering a period that ended 20 years ago.

of return. It is considered that higher rate of return is appropriate in the context of NPISHs where costs of capital are likely to be higher.

Calculating the net return to capital in practice

30 As indicated above, by definition the net return to capital is equal to the rate of return to capital multiplied by the value of non-financial assets used in production of non-market output. For current price estimates, nominal values (for both the rate of the return to capital and the value of non-financial assets) should be used. For volume estimates, the nominal rate of return to capital in the base period should be used, with the value of assts calculated using the prices of assets in the base period.

31 For countries with sectoral balance sheets, which are usually compiled using the perpetual inventory method (PIM), the calculation is reasonably straightforward. The scope of assets to which the return to capital should be applied are those non-financial assets that are used directly in the production of non-market output. As such any non-financial assets used in market production (or not used at all in production), which for the sectors under consideration is likely to be only a small proportion, should be excluded.¹⁶ A breakdown by asset-type is not necessary as the same rate of return to capital is applied to all asset classes.

32 Clearly, where sectoral balance sheets do not exist, the preferred approach is not possible. It should be noted at the outset that this is a broader issue. Balance sheets are an integral part of the sequence of economic accounts. The PIM that produces balance sheet estimates also produces estimates of depreciation (formerly known as consumption of fixed capital) which is also necessary to calculate the value of non-market output. Importantly, depreciation estimates are also needed to calculate net measures such net domestic product and net national income. In the 2025 SNA, net measures are given greater prominence. It is recognized that this broader issue is one that will require focus in the implementation of the 2025 SNA. To this end, the IMF is developing guidance and a supporting tool for countries using the simplified PIM set out in Annex C of *Measuring Capital*. It is hoped that initiatives such as this will improve the availability of balance sheets and via this provide information to use in measuring the net return to capital for non-market production.

33 However, it is likely that by the time the 2025 SNA is implemented that there will be some countries that will still not have balance sheets. Such countries, in the absence of balance sheets, must be currently resorting to using surrogate measures for producing estimates of consumption of fixed capital for 2008 SNA purposes, generally based on simple models that are heavily driven by assumptions (which are either implicit or explicit).

34 Inevitably, in the absence of balance sheets, surrogate measures will also be required for estimating the net return to capital for valuing non-market output. Here, there would seem to be two possible ways to proceed. One would be to have a simple 'rule of thumb' by which the

¹⁶ In the absence of specific information about the value of a sector's non-financial assets used in market production, this could be estimated by multiplying the sector's share of revenue from market production by the total value of the sector's non-financial assets. It should also be noted that the same limitation on the scope of assets used in the calculation of the net return to capital applies to the calculation of depreciation in the valuation of non-market output using the sum of costs approach.

net rate of return to capital would be set to some pre-determined ratio of the associated depreciation estimate. Under a not implausible set of circumstances, the net rate of return to capital would be very similar to the estimate of depreciation, so a 1:1 ratio could be considered appropriate. A somewhat more sophisticated approach would be to consider a range of scenarios with different assumptions that would establish various ratios of net return to capital to depreciation, and a country could chose the ratio for the assumptions that best matched its circumstances. It should be relatively straightforward to develop these scenarios well before the implementation of the 2025 SNA. It should be stressed though, that whatever approach is adopted, it should be seen as stop-gap measure pending the implementation of a PIM, simplified or otherwise.

Summary of recommendations

35 This paper makes the following recommendations:

- 1. The preferred method of determining the net return to capital for non-market production is to multiply a rate of return to capital by the value of non-financial assets used in non-market production.
- 2. To promote stability and international comparability, it is proposed that for estimating general government non-market output a real rate of return of two percent be used as default rate, unless there are good reasons to choose a different rate.
- 3. The nominal rate of return for a country should equal the real rate of return plus the country's target inflation rate. If a country does not have a target inflation rate, a default rate of three percent can be used, unless there are good reasons to use a different rate.
- 4. For central bank non-market output, it is proposed to use the same nominal rate of return as for general government.
- 5. For NPISH non-market output, it is proposed to use a real rate of equal to the real rate of return for general government plus one percent, with the nominal rate of return calculated using the same inflation measure that is applied in calculating the nominal rate of return for government.
- 6. Where countries do not have balance sheets to enable the preferred method of calculating the net return to capital for non-market production, it is proposed to use a surrogate measure based on a pre-determined relationship between the net return to capital and depreciation (with the specifics of this to be developed). Such countries are strongly encouraged to adopt at least a simplified PIM, not only to provide balance sheet information that could be used to calculate the next return to capital for non-market production, but also to provide higher quality estimates of depreciation for both estimating the value of non-market output and for deriving important net measures such as net domestic product and net national income.

The full sequence of accounts for measuring non-market production when using the sum of costs approach

A1 This appendix provides two worked examples of the full sequence of account for measuring non-market production. The first example (A) includes a net return to capital in line with the 2025 SNA. The second example (B) excludes a net return to capital in line with the recording in the 2008 SNA.

A2. The examples are based on the following scenario for the non-market production of goods that are provided free of charge by the general government to households:

Staff costs	25
Material costs (imports)	15
Depreciation on fix-assets used in non-market production	12
Net return to capital on non-financial assets used in production	13
Total cost	65
Total costs (excluding net return to capital)	52

A3 In comparing the two examples, one can observe the following:

- In example A, the value of general government output is 65, which is 13 greater than the value in example B (52). This difference is attributable to the value of the net return to capital included in example A.
- The same difference of 13 is observed in the values for value added (gross) and value added (net), with the values in example A being higher by that amount.
- In example A, gross operating surplus is 25 (equal to depreciation plus the net return to capital) and net operating surplus is 13 (equal to the net return to capital). In example B, gross operating surplus is 12 (equal to depreciation) and net operating surplus is 0.
 - Some see having a net operating surplus greater than zero for a non-market producer as being incongruous with their "not-for-profit nature".¹⁷ Having a net operating surplus which is equal to the net cost of capital does not make a producer 'profitable'; rather it represents an amount that is available to cover the net costs of capital of the producer.
- In example A, the general government final consumption expenditure is 65, compared to 52 in example B. As the value of general government final consumption expenditure equals the value of general government output (in this example), this reflects the inclusion of the net return to capital of 13 in the example A.
- Both examples have the same values for:
 - Gross saving: -40 (general government)

¹⁷ The inclusion of a return to capital in the sum of costs does not violate the SNA's consideration of what constitutes a non-profit institution. As explained in SNA 2008 paragraph 4.83 (which defines non-profit institutions), non-profit institutions can generate either surpluses or deficits; however, any surpluses they make cannot be appropriated by other institutional units.

- Net saving: -52 (general government)¹⁸
- Ner lending/borrowing: -52 (general government)

Example A: Net return to capital included as a cost of production (SNA 2025 treatment)

	General		Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy
Intermediate consumption	15	0	15	Output	65	0	6
Depreciation	12	0	12				
Value added areas	50	0	50				
Value added, gross Value added, net	38	0	30				
volue obded, net	50		50				
Generation of earned income account							
Expanditures	General	Hourobolds	Total		General government	Households	Tota
Expenditures Remuneration of employees	government 25	Households 0	economy 25		government 50	Households 0	economy 50
Remuneration of employees	25	U	25	Value added, gross Value added, net	38	0	38
Operating surplus, gross	25	0	25				
Operating surplus, net	13	0	13				
Allocation of earned income account							
	General		Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy
				Operating surplus, gross	25	0	25
				Operating surplus, net	13	0	13
				Remuneration of employees	0	25	25
Balance of primary incomes, gross	25	25	50				
Balance of primary incomes, net	13	25	38				
,,,,,,,,,,,,,,,							
Income transfers other than social tra	insfers in kind acc	ount		-			
	General		Total		General		Tota
Expenditures	government	Households	economy		government	Households	economy
				Balance of primary incomes, gross	25	25	50
				Balance of primary incomes, net	13	25	38
Disposable income, gross	25	25	50				
Disposable income, net	13	25	38				
Use of disposable income account							
	General		Total		General		Tota
Expenditures	government	Households	economy		government	Households	economy
Final consumption expenditure	65		65		25	25	50
				Disposable income, net	13	25	38
Saving, gross	-40	25	-15	1			
Saving, net	-52	25	-27				
Capital account							
	General		Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy
Depreciation	-12	0	-12	Saving, gross	-40	25	-15
				Saving, net	-52	25	-27
Net lending (+)/Net borrowing (-)	-52						
		25	-27				

¹⁸ If the non-market production had related to own-account capital formation, and not final consumption expenditure, there would have been different net and gross savings estimates between the two examples.

Example B: Net return to capital excluded as a cost of production (SNA 2008 treatment)

	General		Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy
Intermediate consumption	15	0		Output	52	0	52
Depreciation	12	0	12				
Value added, gross	37	0	37				
Value added, net	25	0	25				
Generation of earned income account							
	General		Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy
Remuneration of employees	25	0	25		37	0	37
				Value added, net	25	0	25
Operating surplus, gross	12	0	12				
Operating surplus, net	0	0	0				
Allocation of earned income account							
	General		Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy
				Operating surplus, gross	12	0	12
				Operating surplus, net	0	0	0
				Remuneration of employees	0	25	25
Balance of primary incomes, gross	12	25	37				
Balance of primary incomes, net	0	25	25				
Income transfers other than social tran	nsfers in kind acc	ount					
	General		Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy
				Balance of primary incomes, gross	12	25	37
				Balance of primary incomes, net	0	25	25
Disposable income, gross	12	25	37				
Disposable income, net	0	25	25				
Use of disposable income account							
5	General	Usualada	Total		General		Tota
Expenditures	government	Households	economy	Revenues	government	Households	economy 37
	E 2		E2		12		
Final consumption expenditure	52		52	Disposable income, gross	12	25 25	
	52		52	Disposable income, gross Disposable income, net	12 0	25	25
	-40	25	-15				
Final consumption expenditure		25 25					
Final consumption expenditure Saving, gross	-40		-15				
Final consumption expenditure Saving, gross Saving, net	-40		-15				
Final consumption expenditure Saving, gross Saving, net	-40 -52		-15 -27 Total		0		25
Final consumption expenditure Saving, gross Saving, net Capital account	-40 -52 General	25	-15 -27 Total	Disposable income, net Revenues Saving, gross	0 General government -40	25 Households 25	25 Total economy -15
Final consumption expenditure Saving, gross Saving, net Capital account Expenditures	-40 -52 General government	25 Households	-15 -27 Total economy	Disposable income, net	0 General government	25 Households	25 Total economy