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Introduction to Monetary Accounting

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Environmental Statistics for the Sustainable Development Goals (SDGs)


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Agenda


1. Introduction to monetary asset accounts
2. Exercise on NPV calculation
3. Monetary asset accounts for timber resources



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1 Introduction to monetary asset accounts



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What is a monetary asset account?

The monetary account reflects a **valuation of the physical asset account**

- The definitions of the entries presented in the monetary accounts **align exactly** with the same entries as defined in physical terms
- For some assets, the **measurement scope is smaller** (e.g. timber resources not used for wood supply are excluded)
- The only additional entry: **revaluations**


Table 5.3
Conceptual form of the monetary asset account (*currency units*)

Opening stock of resources
Additions to stock of resources
Growth in stock
Discoveries of new stock
Upward reappraisals
Reclassifications
Total additions to stock
Reductions in stock of resources
Extractions
Normal loss of stock
Catastrophic losses
Downward reappraisals
Reclassifications
Total reductions in stock
Revaluation of the stock of resources
Closing stock of resources

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Why do a monetary valuation?

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Advantages of monetary asset valuation


- Different environmental assets can be compared
- environmental assets can be compared against other (economic) assets in order to assess relative returns, national wealth and similar types of analysis
- may provide useful information for assessing future streams of income for government

 Many environmental assets are **not purchased in a market place**, the estimation of values requires the use of **assumptions and models**

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How to estimate market prices?

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When the items in question have not been purchased or sold on the market in the recent past, an estimation has to be made what the prices would be if a regular market existed.

Market price equivalents	Prices for similar products or assets
Written down replacement costs	Equal to the original purchase price adjusted for depreciation and the current replacement cost
Net present value (NPV)	Assesses the value of the future flow of benefits (income) from using or owning the asset

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What is the NPV?

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Principles of the NPV

- Typically, NPV projections are based on the **history of returns** earned from the use of the asset
- It is assumed that **returns earned in the current period are worth** more to the extractor than returns earned in the future
- Therefore **the stream of expected returns is discounted** to reflect the value that a buyer would be prepared to pay for the asset in the current period


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What is the logic of the NPV?

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1. Estimate past resource rent from sale of resources
2. Estimate the physical stock and remaining asset life assuming a rate of extraction
3. Estimate future annual flows of resource rent over the asset life
4. Discount each future annual estimate of resource rent
5. Sum the discounted estimates



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How is the NPV calculated?

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NPV formula


$$V_t = \sum_{\tau=1}^{N_t} \frac{RR_{t+\tau}}{(1+r_t)^\tau}$$

- V_t = value of the asset of time t
- N = asset life
- **RR = resource rent**
- r = nominal discount rent

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What is the resource rent?

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- Economic [or resource] rent is best considered to be the **surplus value** accruing to the extractor or user of an asset calculated **after all costs and normal returns have been taken into account**.
- Resource rent and the net return to environmental assets **can be derived within the national accounts framework** through a focus on the operating surplus of extracting enterprises


Relationships between different flows and income components

Output (sales of extracted environmental assets at basic prices, includes all subsidies on products, excludes taxes on products)
Less Operating costs
Intermediate consumption (input costs of goods and services at purchasers' prices, including taxes on products)
Compensation of employees (input costs for labour)
Other taxes on production plus other subsidies on production
Equals Gross operating surplus—SNA basis ^a
Less Specific subsidies on extraction
Plus Specific taxes on extraction
Equals Gross operating surplus—for the derivation of resource rent
Less User costs of produced assets
Consumption of fixed capital (depreciation) + return to produced assets
Equals Resource rent
Depletion + net return to environmental assets ^b

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How to estimate the resource rent?

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Three main approaches:


- Most commonly applied: **Residual value method** → resource rent is estimated by deducting user costs of produced assets from gross operating surplus after adjustment for any specific subsidies and taxes (→ national account data sets)
- **Appropriation method** → resource rent is estimated using the actual payments made to owners of environmental assets
- **Access price method** → based on the fact that access to resources may be controlled through the purchase of licenses and quotas, as is commonly observed in the *forestry* and fishing industries. When these resource access rights are freely traded, it is possible to estimate the value of the relevant environmental asset from the market prices of the rights.


! Appropriation method and access price method can depend heavily on institutional arrangements in a country → Residual value method should be applied and reconciled with estimates obtained from other methods



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2 Exercise on NPV calculation

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3 Monetary asset accounts for timber resources



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Some basic principles

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Monetary asset accounts for timber resources

- = Monetary value of opening and closing stock of timber and changes in value over the accounting period
- Most changes (addition and reductions) **relate directly to changes in the physical asset account**, other changes are due to **changes in timber prices** (revaluations)
- Based only on volume of **timber resources that can be harvested**
- Estimates are made for the value of natural growth and the value of removals
 - **Cultivated timber resources:**
 - natural growth = increase in inventories
 - removals = decrease in inventories
 - SNA records only the change in inventory, SEEA records entries on a gross basis
 - **Natural timber resources:**
 - natural growth = not an increase in inventories
 - removals = point at which the resource enters the economy and the output is recorded

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Resource rent?

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SEEA-CF 5.378 ff

- Resource rent on timber resources can be derived as the **gross operating surplus** from the harvest of timber resources (after taking into account specific taxes and subsidies) **less the value of the user costs of produced assets** used in the harvesting process
- Where relevant: an **estimate of the resource rent attributable to land** (where land may be potentially of value for other purposes) should be deducted
- Also derived from **stumpage price** (the amount paid per cubic meter of timber by the harvester to the owner of the timber resources) multiplied by estimates of the expected volume of standing timber per hectare at the expected harvesting age
 - yields future receipts
 - discounted (over the time from the current period to the expected harvest period) for the purpose of estimating a value per hectare for each age class
 - multiplied by the total area of each age class and added to give the value of the total stock of standing timber (=NPV)

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What does it look like?

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Monetary asset account for timber resources (currency units)

	Type of timber resource		Total
	Cultivated timber resources	Natural timber resources (available for wood supply)	
Opening stock of timber resources	86 549	82 428	168 977
Additions to stock			
Natural growth	12 364	11 334	23 698
Reclassification	515	1 546	2 061
Total additions to stock	12 879	12 879	25 759
Reductions in stock			
Removals	13 395		
Felling residues	1 752		
Natural losses	309		
Catastrophic losses			
Reclassification	1 546		
Total reductions in stock	17 001	11 849	28 850
Revaluations		16 692	16 692
Closing stock of timber resources	82 428	100 150	182 578

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Reclassification = change in status
cultivated → natural

Revaluations = change in price

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Thank you!

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