



## Table of contents

<b>Foreword</b> .....	5
<b>Acknowledgements</b> .....	6
<b>TABLE OF CONTENTS</b> .....	7
<b>PART A: COMPILATION</b> .....	13
<b>1. THE INPUT-OUTPUT FRAMEWORK IN THE EUROPEAN SYSTEM OF ACCOUNTS (ESA 1995)</b> .....	15
1.1 Introduction.....	17
1.2 Outline of the supply and use system .....	18
1.3 Outline of symmetric input-output tables.....	24
1.4 Requirements of the ESA 1995 for the input-output framework data.....	29
<b>2. COMPILATION PRINCIPLES AND METHODS</b> .....	33
2.1 Introduction.....	35
2.2 Layout of national input-output framework.....	42
2.3 Compilation methods.....	45
2.4 National database.....	47
<b>3. SUPPLY AND USE TABLES AS AN INTEGRAL PART OF THE COMPILATION OF NATIONAL ACCOUNTS</b> .....	49
3.1 Introduction.....	51
3.2 Compilation of national accounts.....	51
3.3 Relationship between supply and use tables and national accounts aggregates.....	58
3.4 Methodological advantages of supply and use tables as an integral part of the compilation of national accounts .....	64
3.5 Practical advantages of supply and use tables as an integral part of the compilation of national accounts .....	65
3.6 Resources.....	66
<b>4. THE SUPPLY TABLE</b> .....	67
4.1 Introduction.....	69
4.2 Compilation of the supply table.....	72
4.2.1 Production matrix .....	72
4.2.2 Import matrix.....	73
4.2.3 Trade margins .....	74
4.2.4 Transport margins.....	77
4.2.5 Taxes less subsidies on products .....	85
4.2.6 Aggregation of the supply table.....	86
4.3 Production matrix .....	89
4.3.1 Types of output .....	89
4.3.2 Output valuation .....	91
4.3.3 General compilation problems .....	95
4.3.4 Specific types of industries and products.....	97
4.4 Imports .....	111
4.4.1 Introduction: general description and definition .....	111

4.4.2	The problems of valuation.....	113
4.4.3	Compilation problems.....	115

**5. THE USE TABLE ..... 119**

5.1 Introduction..... 121

5.2 Compilation of the use table..... 126

5.2.1 The input approach ..... 129

5.2.2 The output approach..... 132

5.2.3 Compilation of uses by categories..... 138

5.2.4 Some accounting conventions ..... 139

5.3 Institutional sectors, industries and homogeneous production units ..... 140

5.4 Intermediate consumption..... 146

5.4.1 General approaches ..... 146

5.4.2 Compilation of intermediate consumption by industry..... 147

5.4.3 Compilation of intermediate consumption by products..... 147

5.4.4 Special treatments ..... 148

5.5 Final consumption expenditure..... 149

5.5.1 Households' final consumption expenditure ..... 150

5.5.2 Actual final consumption and final consumption expenditure ..... 152

5.5.3 The final consumption by purpose ..... 153

5.5.4 Estimation methods used in practice from statistical sources ..... 153

5.6 Gross capital formation..... 154

5.6.1 Gross fixed capital formation ..... 154

5.6.2 Changes in inventories ..... 156

5.7 Exports..... 157

5.8 Value added..... 158

5.8.1 Compensation of employees ..... 159

5.8.2 Consumption of fixed capital..... 159

5.8.3 Breakdown of some aggregates..... 159

5.8.4 Compiling the generation of income accounts in practice..... 159

5.8.5 Output ..... 160

**6. THE VALUATION MATRICES ..... 161**

6.1 Introduction..... 163

6.2 Valuation concepts of product flows ..... 163

6.2.1 Valuation concepts in the ESA 1995..... 163

6.2.2 The valuation matrices in the supply and use framework..... 166

6.3 Trade margins..... 173

6.3.1 Definition and kinds of trade margins..... 173

6.3.2 Compilation of trade margin matrices..... 174

6.4 Transport margins..... 180

6.4.1 Definition and kinds of transport margins..... 180

6.4.2 Compilation of transport margin matrices..... 182

6.5 Taxes and subsidies on products..... 185

6.5.1 Definition of taxes and subsidies on products..... 185

6.5.2 Compilation of product tax and subsidy matrices..... 186

**7. IMPORT MATRICES..... 189**



7.1	Introduction.....	191
7.2	Imports in the supply and use framework.....	193
7.2.1	Definition of imports.....	193
7.2.2	Use tables of imports.....	193
7.3	Compilation of the use table of imports.....	197
7.3.1	The general approach.....	197
7.3.2	Specific issues.....	202
<b>8.</b>	<b>BALANCING SUPPLY AND USE.....</b>	<b>205</b>
8.1	Introduction.....	207
8.2	Supply and use tables and the link with the institutional sector accounts.....	209
8.3	Balancing the supply and use system.....	211
8.4	Assumptions about available data for the current year.....	217
8.5	Initial version of supply and uses with predetermined and estimated values.....	218
8.5.1	A complete but unbalanced system.....	218
8.5.2	Predetermined values.....	218
8.5.3	Other values estimated from statistical information for the current year.....	219
8.5.4	Statistical information from preceding or following years.....	219
8.5.5	Moving from one year to another.....	219
8.5.6	Bringing together information from the different sources.....	220
8.5.7	Initial trade and transport margins.....	220
8.5.8	Initial other taxes and subsidies on products.....	221
8.5.9	Initial value added tax.....	221
8.5.10	Use of virtual products and industries.....	222
8.6	Balancing procedures.....	222
8.6.1	Automatic balancing.....	222
8.6.2	Manual balancing.....	225
8.6.3	Final balancing.....	226
8.7	Conclusion.....	228
<b>9.</b>	<b>SUPPLY AND USE TABLES AT CONSTANT PRICES.....</b>	<b>229</b>
9.1	Introduction.....	231
9.1.1	Purposes of constant price calculation in national accounts.....	231
9.1.2	Advantages of the calculation of values at constant prices in a supply and use framework.....	231
9.1.3	The link between supply and use tables at current and constant prices.....	233
9.2	The role and choice of price and volume indicators.....	239
9.2.1	The object of measurement and the choice of indicators.....	239
9.2.2	The link between value, price and volume in the collection of data.....	239
9.2.3	Aggregation levels for the deflation of goods and services.....	241
9.3	Weighting.....	242
9.3.1	Choice of index number formulae.....	242
9.3.2	Choice of base year.....	245
9.3.3	Some practical results of different index number formulae and base years.....	245
9.3.4	Weighting detailed price and quantity information to form a volume indicator at the aggregation level of the supply table.....	246
9.4	Compiling supply and use at current and constant prices.....	247
9.4.1	Introduction.....	247
9.4.2	Simultaneous compilation of current and constant prices.....	248
9.4.3	Sequential compilation of current and constant prices.....	251



9.5	A numerical example of more extended simultaneous balancing .....	252
9.5.1	Introduction .....	252
9.5.2	First estimates of supply and use .....	252
9.5.3	Considerations when balancing the product .....	254
9.5.4	A possible solution of the balancing problems in the numerical example .....	254
9.6	Deflation of supply of goods and services .....	258
9.6.1	Domestic production .....	258
9.6.2	Imports of goods and services .....	260
9.7	Deflation of trade and transport margins .....	261
9.7.1	Deflation of trade margins .....	261
9.7.2	Deflation of transport margins .....	262
9.8	Deflation of taxes and subsidies on products .....	263
9.8.1	Introduction .....	263
9.8.2	Taxes and subsidies on products .....	263
9.9	Deflation of use of goods and services .....	266
9.9.1	Intermediate consumption by industries .....	266
9.9.2	Exports of goods and services .....	268
9.9.3	Private consumption of households .....	268
9.9.4	Government consumption .....	269
9.9.5	Gross fixed capital formation .....	269
9.9.6	Changes in inventories .....	269
9.10	Value added by industry .....	270
9.10.1	Total value added .....	270
9.10.2	Compensation of employees .....	270
9.10.3	Deflation of other taxes and subsidies on production .....	272
<b>10.</b>	<b>TABLES LINKING THE SUPPLY AND USE TABLES TO THE SECTOR ACCOUNTS .....</b>	<b>275</b>
10.1	Introduction .....	277
10.2	Production accounts and generation of income accounts .....	279
10.3	Input-output and functional analysis in the ESA 1995 .....	280
10.4	Description of the cross table .....	282
10.5	Compilation aspects .....	285
10.5.1	Functional aspects in the use of information .....	285
10.5.2	Institutional aspects in the use of information .....	288
10.6	Analytical applications of the cross table .....	290
<b>11.</b>	<b>TRANSFORMATION OF SUPPLY AND USE TABLES TO SYMMETRIC INPUT-OUTPUT TABLES .....</b>	<b>293</b>
11.1	Introduction .....	295
11.2	Conversion of the supply and use tables to symmetric tables .....	297
11.2.1	Data base for the transformation .....	297
11.2.2	Product-by-product versus industry-by-industry tables .....	301
11.2.3	Statistical units underlying symmetric input-output tables and supply and use tables .....	307
11.2.4	Types of secondary production .....	308
11.3	Theoretical framework for derivation of symmetric input-output tables .....	309
11.3.1	Product-by-product tables .....	311
11.3.2	Industry-by-industry tables .....	315
11.4	Evaluation of the various assumptions; the problem of the negatives .....	317
11.4.1	Product technology versus industry technology .....	317



11.4.2	Causes of negative input-output elements in the product technology .....	319
11.4.3	Note on the consistency between symmetric input-output tables and supply and use tables.....	320
11.4.4	Dealing with negatives .....	323
11.5	Derivation of input-output tables in practice .....	325
11.5.1	Making supply and use tables square .....	325
11.5.2	The calculation of the symmetric input-output table .....	325
11.5.3	Recalculation of the use table .....	326
11.6	Practical problems .....	327
11.6.1	Treatment of by-products .....	327
11.6.2	Symmetric input-output tables for domestic production and imports .....	332
11.6.3	Symmetric input-output tables at constant prices.....	333
11.7	Compilation issues .....	334
11.7.1	Rectangular supply and use tables .....	334
11.7.2	Input-output and quality in official statistics .....	340
11.7.3	Products, units and technology .....	342
11.7.4	Implications of the split between domestic output and imports .....	343
11.7.5	Compilation of input-output tables in practice.....	344
11.8	Transformation models.....	345
11.8.1	Input-output framework .....	346
11.8.2	The main transformation models.....	347
11.8.3	The transformation models with domestic output and imports.....	353
11.8.4	Numerical examples.....	357
11.8.5	Empirical application of the transformation models.....	363
11.9	Outlook.....	364
<b>12.</b>	<b>SUPPLEMENTARY INFORMATION AND DISAGGREGATION OF EXPENDITURE.....</b>	<b>371</b>
12.1	Introduction.....	373
12.2	Supplementary information .....	373
12.2.1	Labour inputs .....	374
12.2.2	Capital formation and capital stock.....	377
12.2.3	Physical flows.....	383
12.3	Disaggregation of expenditure.....	389
12.3.1	Final consumption expenditures by purpose.....	393
12.3.2	Outlays of producers by purpose.....	398
<b>PART B:</b>	<b>EXTENSIONS AND APPLICATIONS.....</b>	<b>401</b>
<b>13.</b>	<b>EXTENDED INPUT-OUTPUT TABLES AS PART OF SATELLITE SYSTEMS.....</b>	<b>403</b>
13.1	Satellite analysis .....	405
13.2	General conceptual considerations on extending input-output .....	406
13.2.1	Beyond the narrow concept of production .....	406
13.2.2	Beyond the economic concept of transactions .....	406
13.2.3	Limits of monetary valuation .....	406
13.2.4	Uses of physical accounting .....	407
13.2.5	Uses of time accounting .....	408
13.3	Comparison of the concepts of three types of extended input-output tables .....	409
13.3.1	Classification of activities.....	409
13.3.2	Primary inputs.....	409



13.3.3	Intermediate inputs .....	412
13.3.4	Outputs .....	412
13.3.5	Final uses .....	414
13.4	Description of the three types of input-output tables .....	416
13.4.1	General comments .....	416
13.4.2	Extended monetary input-output table .....	416
13.4.3	Physical input-output table .....	419
13.4.4	Time input-output table .....	419
13.4.5	Outlook .....	424
13.5	Social Accounting Matrices (SAM) and extended input-output tables .....	424
13.5.1	SAM and input-output framework .....	424
13.5.2	Linkages of SAM and input-output in the ESA .....	426
13.5.3	Example of a SAM based on input-output analysis (SAMIO) .....	426
<b>14.</b>	<b>UPDATING AND PROJECTING INPUT-OUTPUT TABLES .....</b>	<b>447</b>
14.1	Introduction .....	449
14.2	Univariate methods .....	449
14.2.1	Proportional Correction Method .....	449
14.2.2	Statistical Correction Method .....	451
14.3	Bivariate methods .....	451
14.3.1	RAS procedure .....	451
14.3.2	Model of Double Proportional Patterns .....	457
14.3.3	Procedure of Selected Coefficients .....	457
14.4	Stochastic procedures .....	458
14.4.1	Lagrange method .....	458
14.4.2	Least Squares Method .....	459
14.4.3	Minimisation approach .....	460
14.4.4	Euro method .....	461
<b>15.</b>	<b>APPLICATIONS .....</b>	<b>477</b>
15.1	Introduction .....	479
15.1.1	Input-output tables .....	479
15.1.2	Input-Output coefficients .....	484
15.1.3	Static input-output model .....	486
15.1.4	Price model .....	490
15.1.5	Central model of input-output analysis .....	493
15.1.6	Basic input-output models with input and output coefficients .....	495
15.1.7	Indicators and multipliers .....	497
15.2	Other applications .....	510
15.2.1	Input-output models with endogenous final demand .....	510
15.2.2	Linear programming models .....	513
15.2.3	Dynamic input-output models .....	517
15.2.4	Other input-output models .....	527
<b>REFERENCES</b>	.....	<b>535</b>
<b>GLOSSARY</b>	.....	<b>549</b>
<b>INDEX</b>	.....	<b>581</b>