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Review of NTA from SNA perspective
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Table of Contents

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The present paper is an extended and revised version of the NTA annex on SNA and NTA of the NTA Manual. It uses 2012 tentative SNA data of The Netherlands, and includes comments on NTA concepts and treatments.

The paper deals with National Transfer Accounts (NTA) concepts, treatments and compilation and is written from a System of National Accounts (SNA) perspective. The purpose of this paper is two-fold. One is to show how NTA analysis differs from SNA analysis and thus how and why NTA and SNA frameworks and concepts differ. In this approach NTA is treated as a satellite of SNA, in which concepts of NTA are derived from SNA concepts in order to serve different analysis. The second objective of the paper is to give, in this light, critical comments on NTA concepts and treatments from an SNA perspective. The sections dealing with comments have been scattered throughout the paper, but presented in separate sections together with the relevant aspects of the NTA that are discussed. The comments may contribute to a discussion of concepts and compilation methods of NTA, which may ultimately result in improvements of the system.

1. Introduction

The main NTA concepts are closely related to the SNA (System of National Accounts[2]). This refers especially to the SNA concepts of final consumption, labour income including compensation of employees and mixed income, current transfers, property income and operating surplus, and particularly, saving. Specialized NTA concepts such as the life cycle deficit and surplus, the transfer deficit and surplus, and asset based revenues can be defined in terms of SNA concepts. It is therefore suggested in this paper that the NTA be compiled as an NTA *satellite* to SNA, using SNA concepts and NTA adjustments to those, and following SNA compilation procedures. This is alternative to the approach suggested in the main part of an NTA Manual, in which NTA concepts are measured directly, without interference of SNA compilation procedures.

The information in this paper may be used when NTA specialists seek support from national accountants in the development of NTA through SNA, and in particular when national accounts have a limited scope (generally GDP and its breakdowns only) and need to be extended, using additional non-SNA data in order to serve as a basis for conversion to NTA. In this conversion we are conscious of the fact that NTA has another analytical objective than SNA. Following the SNA compilation procedure in NTA has the advantage of being able to draw on the extensive national accounts compilation expertise that has been developed over decades. Developing the estimates[3]

[2] United Nations, European Commission, International Monetary Fund, Organization for Economic Co-operation and Development, and World Bank (1993). System of National Accounts, 1993, United Nations publication, Sales No. E.94.XVII.4 & (2008) Sales No. E.08.XVII.29.

[3] The term estimates as distinct from data is used in the larger part of this paper. The reason is the following: Data is information that is obtained from surveys and administrative data sources. Data are generally not complete and not consistent. Therefore data are adjusted and extended, resulting in figures that are not obtained from the basic data sources. This applies to SNA and therefore figures for SNA items are referred to as SNA estimates. The same applies to NTA, which is partly based on SNA estimates and partly on data from

within an SNA framework leads to more reliable estimates, as they are made consistent not only with the limited set of mainly income and expenditure estimates of an NTA framework, but also with production estimates that are the main ingredients of an SNA framework.

2. NTA compiled as satellite to SNA

Compilation of NTA through SNA may include three steps:

1. Firstly, an NTA framework is defined, in which the NTA analysis orientation and the NTA variables playing a role therein are made explicit, and which differ from the SNA framework, analysis and variables. Proto-type SNA and NTA frameworks are presented respectively in tables 1 and 2 and discussed in sections 3.2 and 3.3 of this paper. Tables 1 and 2 use the same sectors and transactions as in SNA, but NTA table 2 limits the flows to SNA transaction concepts that are relevant to NTA, and changes the framework format to NTA analysis.
2. Secondly, a detailed conceptual conversion is defined between SNA and NTA variables. This is done in section 4 for a selection of SNA and NTA variables. In this section, detailed SNA variables are converted from the double bookkeeping system of SNA to the single entry system of NTA.
3. Thirdly, estimates are compiled on the basis of the SNA framework, either directly based on SNA estimates that are available in much SNA detail, or based on a limited set of SNA estimates that are supplemented by additional non-SNA data and assumed SNA relations between those data and estimates. Once a full set of SNA estimates is available, they are converted to NTA estimates in line with the framework features of NTA in table 2 and the detailed SNA-NTA conversions dealt with in section 4. The SNA compilation of NTA estimates is dealt with in section 5.

Not included in the three steps is the attachment of age profiles to the flows identified in the detailed NTA-SNA table 2; this is described in much detail in other sections (e.g. basic methods of age profiles are described in section 3.3) of the NTA Manual[4]. The age profiles may be applied to flows that are more detailed than the SNA detail used in this paper. How to arrive at this further detail is also not described in the present paper, but in sections of the NTA Manual, in particular in the sections that deal with the two main data sources of NTA, i.e. GOV administrative records (NTA Manual, section 6.2, which deals with public sector reallocations and in particular the construction of macro totals) and Household (HH) surveys (NTA Manual section 5.3.1, which deals with selection and preparation of HH survey data). Instead of Government (GOV) administrative data records, the NTA Manual also frequently relies on IMF Government Finance Statistics (GFS), which are compatible with SNA. And finally also is excluded from this paper a description of the extension of NTA flows to include flows between and within HH's, called in the NTA respectively inter-HH and intra-HH flows. The reason is that intra-HH flows are conceptually not included in SNA, while inter-HH flows are generally excluded from SNA estimates due to data limitations in the estimation of those flows. The reader is referred to sections 7.3 and 7.4 of the NTA Manual, where more detailed descriptions are available on how to cover those flows, which are essential to NTA analysis.

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household (HH) and public administration sources. As the latter are adjusted in the process of compiling NTA, they are also referred to as NTA estimates (see section 5 of this paper).

[4] References to the NTA Manual are based on the 12 June version downloaded from http://www.un.org/en/development/desa/population/publications/development/NTA_Manual.shtml

To illustrate the NTA compilation through SNA, tentative 2012 Netherlands data on national accounts, published by Statistics Netherlands[5], are used in all tables of this paper.

3. SNA and NTA frameworks

The NTA Manual makes reference in various sections to a framework that is used to define and compile the SNA and NTA variables, but does not present a framework explicitly. The closest the NTA Manual comes to defining a framework is in tables 4.5, 4.6, 4.14, 4.15, 4.19, which deal with SNA variables of transfers, taxes, property income, and operating surplus and mixed income in the SNA primary and secondary distribution of income accounts, and their re-classification to NTA concepts that are used in the NTA and for which age structures are developed in support of intergenerational analysis. The present paper is an attempt to develop a framework for NTA analysis explicitly, in line with concepts and practices introduced in the NTA Manual, and to show how this framework differs from a framework for SNA analysis.

3.1. *General features of Frameworks, Comments*

Before developing frameworks for SNA and NTA analyses, we will first give some brief comments on what a framework is. In Van Tongeren 2011 (page 10) frameworks are described in generic terms "……as a series of matrices (such as the SUT and IEA matrices) and vectors of variables, between which ratio and identity relations are defined. Basic data are only available for a limited number of the variables, and this lack of information is compensated by ratio values and definitions of ratio and identity relations" and "…..prior reliabilities are defined for data and ratio values, which allow for adjustment of these values, so that conflicts are avoided. The identities serve as criteria in arriving at final estimates that are consistent." The variables included in the frameworks are selected, such that they are able to support, quantitatively when measured, an analytical objective for which the framework was designed. The SNA is one of the first examples of explicitly defined frameworks, which include mainly economic variables (concepts) and many identities and ratios that are defined in the SNA framework between those concepts. The SNA framework with its economic variables or concepts was designed to describe and analyze the working of an economy of a country.

SNA satellite accounts, which are designed to serve specific types of analyses, are defined as frameworks with an alternative set of variables. Those variables may either be elaborations of SNA variables or may introduce new analytical concepts, including environmental accounts[6] and tourism accounts[7]. Environmental accounts studying the interaction between the economy and the environment of a region include in addition to monetary (economic) variables also variables

[5] Netherlands SNA data were downloaded from the Statistics Netherlands Website called STATLINE: http://www.cbs.nl/en-GB/menu/cijfers/statline/zelf-tabellen-maken/default.htm?Languageswitch=on

[6] European Commission, Food and Agriculture Organization, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, "System of Environmental-Economic Accounting, Central Framework" (White cover publication, pre-edited text subject to official editing), 2012.

[7] Commission of the European Communities, Organisation for Economic Co-operation and Development, World Tourism Organization, United Nations, "Tourism Satellite Account: Recommended Methodological Framework", 2008.

describing the quality and quantity of environmental conditions in physical terms. Tourism accounts elaborate in much detail a specific activity of the economy, i.e. tourism services. They include monetary variables on tourist expenditures, value added of tourist activities and may also include non-monetary variables on the number of tourists visiting tourism sites.

The NTA Satellite framework may also be considered as a framework in this sense, as it is defined in terms of matrices and tables and includes demographic data on the number of individuals by age groups, on consumption, labour income, transfers, asset income and saving per age group, and relations can be defined between demographic variables and the economic variables of SNA. The NTA satellite framework includes not only concepts that are "borrowed" from the SNA such as saving, consumption and labour income, but also new concepts, such as the life cycle surplus/deficit, the transfer surplus/deficit and the age profiles that serve the specific NTA analysis. The NTA is the first attempt to relate in a comprehensive manner demographic and economic variables and analyses.

3.2. SNA framework

The basic structure of the SNA is embedded in its accounting framework. The accounts used for the conversion of NTA are those that are included in the so-called Integrated Economic Accounts (IEA) of the system. They are organized in such a manner that they serve optimally the distribution between sectors and within sectors of the economy, of income generated (value added) and received (disposable income), use of income (final consumption), saving and investments, and also the financial implications of those. The sectors that are analyzed in this manner include the NFC, FC, GOV, HH and NPI sectors[8]. The sum of NFC, FC, GOV, HH and NPI sectors is called the Total (or National) Economy and the counterpart of the National Economy is the Rest of the World (ROW). They are the same sectors as presented in tables 4.5, 4.6, 4.14, 4.15, 4.19 of the NTA Manual. Each SNA account identifies one or more balancing items that are not measured directly, but are defined and derived in SNA as a means of summarizing in an analytical manner the information that is contained in the data that are directly measured. The data in each account that are directly measured with help of available statistics are represented by –and what are called in SNA— transaction items.

The SNA accounts are presented in table 1 below, which uses 2012 Netherlands SNA estimates. The table includes accounts, balancing items and transaction items of the 2008 SNA. The main accounts of SNA are identified in the headings on the left hand side of the table; in order to keep the presentation simple, not all accounts are included, but only those that are relevant for explaining the relation between SNA and NTA. Balancing items in each account are presented in bold in the table. The order in which the accounts are presented is the one that is compatible with the Integrated Economic Accounts (tables 16.4 and 16.5) of the 2008 SNA. The SNA sectors are presented as column headings with resources (=receipts) and uses (=expenditures).

[8] Abbreviations are used in this paper for the SNA sectors: NFC refers to the Non-Financial Corporate sector, FC to Financial Corporate sector, GOV to the Government sector, NPI to the Non-Profit sector, HH to the Household sector, and ROW to the Rest of the World

Table 1 SNA Framework of Integrated Economic Accounts (IEA)

Data source: Statistics Netherlands, 2012 tentative data		Total economy		Rest of World		Non/financial corporations		Financial corporations		General government		Households		Non/Profit Institutions	
		Receive	Paid	Receive	Paid	Receive	Paid	Receive	Paid	Receive	Paid	Receive	Paid	Receive	Paid
GOODS AND SERVICES AND PRODUCTION ACCOUNT															
Imports of goods and services	1	0	0	477,234		0	0	0	0	0	0	0	0	0	0
Imports of goods	2	0	0	374,386		0	0	0	0	0	0	0	0	0	0
Imports of services	3	0	0	102,848		0	0	0	0	0	0	0	0	0	0
Exports of goods and services	4	0	0		527,583	0	0	0	0	0	0	0	0	0	0
Exports of goods	5	0	0		420,358	0	0	0	0	0	0	0	0	0	0
Exports of services	6	0	0		107,225	0	0	0	0	0	0	0	0	0	0
Output	7	1,195,892		0	0	839,463		79,965		121,089		149,124		6,251	
Market output	8	1,015,680		0	0	836,803		39,860		19,825		118,318		874	
Imputed banking output	9	39,232		0	0			39,232							
Own account capital formation	10	6,056		0	0	2,660		873		1,559		941		23	
Output for own final use	11	29,865			0		0		0			29,865			
Non-market output	12	105,059		0	0		0		0	99,705				5,354	
Product taxes less subsidies	13		60,261												
Taxes on products	14		63,588	0	0	0	0	0	0	0	0	0		0	
Subsidies on products	15		3,327	0	0	0	0	0	0	0	0	0		0	
Intermediate consumption	16		657,855	-	-		499,566		35,360		45,505		73,994		3,430
Value added, gross / Gross domestic product	17		**538,037**		0		**339,897**		**44,605**		**75,584**		**75,130**		**2,821**
Difference VAT imputed and received by GOV	18		1,040	0	0		643	0		0			397	0	
GDP	19		**599,338**			0	0	0	0	0	0	0	0	0	0
INCOME GENERATION ACCOUNT															
Compensation of employees	20	303,479	309,190	6,788	1,077		210,147		17,741		58,649	303,479	20,088		2,565
Wages and salaries	21	234,517	239,022	5,378	873		165,634		13,137		42,494	234,517	15,767		1,990
Employers' social contributions	22	68,962	70,168	1,410	204		44,513		4,604		16,155	68,962	4,321		575
Taxes on production and imports	23	68,367	71,056	2,689	0		3,794		842	68,367	699		2,110		23
Taxes on products	24	60,899	63,588	2,689	0					60,899					
Other taxes on production	25	7,468	7,468	0	0		3,794		842	7,468	699		2,110		23
Subsidies	26	7,923	8,882	959	0		3,588		77	7,923	721		1,169		
Subsidies on products	27	3,314	3,327	13						3,314					
Other subsidies on production	28	4,609	5,555	946	0		3,588		77	4,609	721		1,169		
Consumption of fixed capital	29		89,044	0	0		46,744		4,128		16,957		20,982		233
Mixed income, net	30		33,516	0	0		0		0		0		33,516		0
Operating surplus, net	31		**138,930**	0	0		**83,443**		**21,971**		**0**		**0**		**0**
PRIMARY AND SECONDARY DISTRIBUTION OF INCOME ACCOUNT															
Property income	32	284,555	271,459	154,743	167,839	49,155	63,025	174,271	183,434	18,738	11,244	42,016	13,743	375	13
Interest	33	112,100	123,256	62,104	50,948	11,841	16,028	87,268	83,241	3,102	11,233	9,598	12,741	291	13
Dividends	34	136,586	98,278	78,255	116,563	31,324	28,834	92,724	69,444	4,385		8,069		84	
Withdrawals from income of quasi-corporations	35	1,730	2,219	706	217		1,505	170	8	250		1,310	706		
Reinvested earnings on foreign direct investment	36	82	13,366	13,366	82	5,973	5,968	-5,891	7,398						
Investment income disbursements	37	23,028	23,311	312	29				23,311			23,028			
Rent	38	11,029	11,029			17	10,690		32	11,001	11	11	296		
Current taxes on income, wealth, etc.	39	65,589	65,212	583	960		9,402		2,882	65,589			52,928		
Taxes on income	40	58,869	58,582	583	870		9,402		2,882	58,869			46,298		
Other current taxes	41	6,720	6,630		90					6,720			6,630		
Net social contributions	42	157,826	156,222	284	1,888	4,901		52,896		99,609		374	156,222	46	
Social security contributions	43	95,780	94,999	284	1,065					95,780			94,999		
Employers' actual pension contributions	44	52,552	51,729		823			52,552					51,729		
Other social contributions	45	0	0												
Employers' imputed social contributions	46	9,494	9,494			4,901		344		3,829		374	9,494	46	
Social benefits other than social transfers in kind	47	111,576	113,632	2,304	248		4,901		35,403		72,908	111,576	374		46
Social security benefits in cash	48	47,771	48,995	1,472	248						48,995	47,771			
Social assistance benefits in cash	49	20,084	20,084								20,084	20,084			
Other social insurance pension benefits	50	34,227	35,059	832					35,059			34,227			
Other private social benefits	51	0	0												
Other social insurance non-pension benefits	52	9,494	9,494				4,901		344		3,829	9,494	374		46
Other current transfers	53	150,451	160,492	15,890	5,849	2,720	4,276	15,790	15,790	103,567	111,464	22,160	25,703	6,214	3,259
Net non-life insurance premiums	54	14,316	16,188	2,040	168		2,632	14,316	1,474		304		11,738		40
Non-life insurance claims	55	16,188	14,316	168	2,040	2,632		1,474	14,316	304		11,738		40	
Miscellaneous current transfers	56	119,947	129,988	13,682	3,641	88	1,644			103,263	111,160	10,422	13,965	6,174	3,219
Primary/ National Incoome	57		**515,949**				**69,573**		**12,808**		**67,938**		**365,268**		**362**
Disposable income, net	58		**505,833**				**58,615**		**27,419**		**152,331**		**264,151**		**3,317**
USE OF INCOME ACCOUNT															
Final consumption expenditure	59		443,908	0	0	0		0			170,614		267,940		5,354
Collective consumption expenditure	60		65,651	0		0		0			65,651				
Individual consumption expenditure	61		378,257	0	0	0	0	0	0		104,963		267,940		5,354
Adjustment for the change in pension entitlements	62	9	0	-9			0	-17,493			-	17,502		0	0
Saving, net	63		**61,934**	0	**-45,897**		**58,615**		**9,926**		**-18,283**		**13,713**		**-2,037**
CAPITAL ACCOUNT															
Consumption of fixed capital	64		89,044	0	0		46,744		4,128		16,957		20,982		233
Capital transfers	65	19,401	21,128	3,588	1,861	2,201	695	786	120	7,810	10,986	7,951	9,327	653	
Investment grants	66	8,242	8,216	40	66	1,839	0		0	6,113	8,216	219	0	71	0
Capital taxes	67	1,383	1,383		0		0		0	1,383	0		1,383		0
Other capital transfers	68	9,756	11,509	3,548	1,795	362	695	786	100	314	2,770	7,712	7,944	582	0
Imputed capital transfers	69	20	20				0		20		0	20	0		0
Gross capital formation	70		105,081	0	0		53,383		3,993		20,022		27,439		244
Fixed capital formation, gross	71		102,007	0	0		50,278		3,993		19,997		27,494		245
Changes in inventories	72		3,287	0	0		3,284		0		0		3		0
Acquisitions less disposals of valuables	73		-213	0	0		-179		0		25		-58		-1
Acquisitions less disposals of non-produced assets	74		0	0	0		289		178		-584		113		4
Net lending (+) / net borrowing (–), capital account	75		**44,170**		**-44,170**		**53,193**		**10,549**		**-23,940**		**5,767**		**-1,399**

The SNA accounts, balancing items, and corresponding analyses reflected in the table are the following:

1. The goods and services account juxtaposes the origins of products –i.e. output and imports—and the destination of products – i.e. intermediate consumption, final consumption, capital formation (investments) and exports. For the Total Economy, this so-called Supply-Use identity is reflected in the Supply figures for Output (lines 7-12) and Imports (lines 1-3) and in the Use figures for Intermediate consumption (line 16), Final Consumption (lines 59-61), Capital formation (lines 70-73), Acquisitions less disposals of non-produced assets (line 74) and Exports (lines 4-6). As the supply figures are in basic prices and the use figures in market prices (respectively excluding and including product taxes less subsidies), the identity between both sides can only be obtained by adding to supply the Product taxes less subsidies (lines 13-15). Thus, for the Total Economy (1,195,892+477,234)+(60,261+1,040) =(657,855+443,908+105,081+0+527,583). The supply-use identity can only be established for the Total Economy and not for sectors, as the taxes less subsidies on products are not distributed by sector in the SNA.
2. The production account includes data on output (lines 7-12) and intermediate consumption (line 16) and derives as balancing item value added (line 17) as the difference between those for each sector, and GDP for the economy as a whole (line 19). For each sector value added can be derived. E.g. for the NFC sector, the derivation of value added is 339,897=839,463-499,566. Value added could be presented gross, i.e. before deduction of depreciation (line 29), or net, i.e. after deduction of depreciation. The net figure for the NFC sector of 293,153=339,897-46,744 is derived from the gross concept by deducting depreciation. Gross and net concepts can be derived for all balancing items, dealt with below. Generally NTA uses the net concepts. GDP is always a gross concept. It is defined only for the Total Economy, and is the sum of value added for sectors. However, as output is in basic prices and intermediate consumption in market prices, product taxes less subsidies (lines 13-15) for the Total economy should be added. GDP is 599,338=538,037+(60,261+1,040[9]).
3. The generation of income account: This account includes the components of value added (lines 20-31), i.e. compensation of employees, mixed income and operating surplus, as well as taxes other than taxes on production. The components are presented in this account as payments by producing sectors. Operating surplus is the balancing item of this account; it is not measured directly, but derived indirectly as a part of national accounting. Thus operating surplus net (line 31) of the NFC sector is the difference between value added, gross on the one hand and the sum of compensation of employees paid (lines 20-22), other taxes less subsidies on production paid (lines 23-28) and depreciation (line 29), i.e. 83,443=339,897-210,147-(3,794-643[10]-3,588)-46,744. For the HH sector the same derivation applies, but instead of operating surplus, mixed income is derived in this manner (33,516 in line 30).
4. The allocation of primary income account is an account that deals with flows to and from production factors. The account starts with operating surplus or mixed income (HH sector), net (line 31 or 30) from the generation of income account, and furthermore includes compensation of employees (lines 20-22) and production taxes less subsidies (lines 23-28) as receipts (payments were already taken

[9] An adjustment item for the difference between VAT imputed (based on VAT levies) and received by the GOV sector (line 18 in table 1) is added (for the Total Economy 1040) to other taxes on production.
[10] 643 is an adjustment item for the difference between VAT imputed and received by the GOV sector. See footnote 9.

into account in the derivation of operating surplus), and the receipts and payments of property income (lines 32-38). This account includes as balancing item the Balance of Primary Income for each sector and the sum of these for all sectors is National Income for the Total Economy. The Balance of Primary income for the GOV sector is 67,938=(68,367-7,923)+(18,738-11,244). National Income, net, is the sum of Primary Incomes of sectors 515,949=69,573+12,808+67,938+365,268+362.

5. Secondary distribution of income account: This account covers all current transfer flows, including receipts and payments of social contributions and benefits (lines 42-52), receipts and payments of current taxes (lines 39-41), and other current transfers including insurance premiums and claims (lines 53-56). The social contributions include pension premiums and benefits of unfunded schemes, and also premiums and benefits of funded schemes, as explained in section 4.1 of this paper. The account includes only current transfers in cash. Transfers in kind, as based on SNA, are not included in this account, but identified in another account that is explained in table 3b of section 4.2. The balancing item of the secondary distribution of income account is Disposable Income; it is derived from the receipts and expenditures of various transaction items in this account, and starting from the Balance of Primary Income of the previous account. Disposable income net, of the HH sector (line 58) is 264,151=365,268-52,928+((374-156,222)+(111,576-374))+(22,160-25,703), and Disposable for the Total Economy is the sum of sector's disposable incomes, i.e. 505,833=58,615+27,419+152,331+264,151+3,317.

6. The use of disposable income account includes only final consumption of HH's, GOV and NPI's (line 59-61) and also an Adjustment item for the Change in Pension Entitlements (line 62), which will be explained in section 4.1 below . The balancing item of this account is Net Saving (line 63), which is an important concept in NTA. Net Saving is derived as the difference between Disposable Income net and final consumption, plus the Adjustment for the Change in Pension Entitlements. For the HH sector this is 13,713=264,151-267,940+17,502 and for the total economy it is the sum of the net saving of sectors, i.e. 61,934=58,615+9,926-18,283+13,713-2,037.

7. The capital account includes gross capital formation in fixed assets (lines 70-73), such as roads, buildings and other structures, changes in inventories and valuables, and also acquisition of other non-produced assets (line 74), such as land, mineral, water and other natural resources. It also includes capital transfers (lines 65-69), as well as depreciation or consumption of fixed capital (line 64). The capital account juxtaposes for each sector saving, capital transfers received less paid and depreciation on the one hand and capital formation and acquisition of other non-produced assets on the other, and thus derives an important balancing item of SNA, i.e. net lending (line 75). For each sector it measures the need for obtaining financial resources from other sectors and the Rest of the World (if minus -), as saving is not sufficient to cover all payments for gross capital formation and acquisition of other non-produced assets, or availability of such resources for other sectors (if plus +). For the Total Economy, net lending represents the financial resources that the country has available for lending to the ROW (if plus +) or needs (if minus -) from the ROW in order to finance its capital formation and acquisition of non-produced assets. For the NFC sector net lending is equal to 53,193=58,615+(2,201-695)+46,744-(53,383+289), and for the Total Economy it is equal to 44,170=53,193+10,549-23,940+5,767-1,399. The latter is the same with opposite sign as net lending of the ROW.

8. The financial account shows how net lending derived from the Capital Account of each sector and also for the Total Economy is financed with (if minus -) or invested in (if plus +) shares, bonds, loans,

and other financial instruments. The financial account is not presented in table 1, as none of the transaction items of this account plays at present a role in NTA.

3.3. NTA framework

While SNA framework and analysis focus on production, income, consumption, investment and financial issues, the analytical objective of NTA is different. The objective of NTA is to measure transfers of resources between generations in order to finance their consumption. As a consequence, the framework of SNA and NTA differ considerably, even though they make use, at least partly, of the same concepts. These differences between SNA and NTA analyses are embedded in different accounting structures of SNA in table 1 and of NTA in table 2. Not all SNA accounts and concepts are used in NTA, the NTA accounts organize those concepts differently, and also the balancing items of the two systems differ.

These differences of NTA as compared with SNA are reflected in table 2. No NTA adjustments have been made yet to the SNA concepts (see section 4 below), so that the same values of transaction items are used in the NTA framework as in SNA, and therefore the 2012 Netherlands SNA estimates used in table 2 are the same as used in table 1.

Table 2 also includes the same sectors as in table 1 and SNA. However, in NTA in addition two main groups are distinguished, i.e. the Public sector, which only refers to the GOV sector of SNA, and the Private sector, which includes all other national sectors, i.e. NFC, FC, HH, and NPI sectors. In the development of NTA tables, the distinction between Public and Private sectors and corresponding Public and Private flows is made explicit. In the present paper this is only done in sections 4.4 and 4.5.

The NTA framework of table 2 distinguishes between three accounts[11] and corresponding balancing items, reflecting NTA analysis, i.e.

1. The Life cycle account juxtaposes labour income (lines 4-8), consisting of compensation of employees and mixed income, with final consumption (lines 1-3). The life cycle surplus/deficit (line 9) is the difference between both. It is calculated for each sector in table 2, but is only meaningful for the Total Economy. In the latter case it is equal to -106,913=(303,479+33,516)-443,908.
2. In the Transfer Account the Transfer surplus/deficit (line 30) is derived for each sector. The NTA only distinguishes between public transfer surpluses/deficits for the GOV sector and private transfer surpluses/deficits for the sum of NFC, FC, HH and NPI sectors. In the table the transfer surplus for the Public (=GOV) sector is equal to the sum of receipts of taxes on production and imports (lines 10-16), receipts of current taxes on income (lines 17-19), receipts of social contributions received less social benefits paid (lines 20-26), receipts less disbursements of other current transfers (lines 28-31), i.e. 144,837=(57,585+2,859+65,589)+(99,609-72,908)+(103,567-111,464). For the Total Economy the transfers surplus/deficit is derived in a similar manner, i.e. 50,328=(57,585+2,859)+(65,589-65,212)+(157,826-156,222)+(111,576-113,632)+(150,451-160,492). In the derivation for the Total Economy, both receipts and payments of current taxes are taken into account, but for taxes less subsidies on production and imports only receipts are included, as disbursements have already been

[11] The three accounts are not explicitly identified in NTA, but are used here in order to clarify the differences between the SNA and NTA frameworks.

Table 2 NTA framework

Data source: Statistics Netherlands, 2012 tentative data		Non-financial corporations		Financial corporations		General government		Households		NPISHs		Total economy		Rest of the world	
		Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments
LIFE CYCLE ACCOUNT															
Final consumption expenditure	1						170,614		267,940		5,354		443,908		
Individual final consumption	2						65,651		0		0		65,651		
Collective final consumption	3						104,963		267,940		5,354		378,257		
Labour income	4		210,147		17,741		58,649	336,995	53,604		2,565	336,995	342,706	6,788	1,077
Compensation of employees	5		210,147		17,741		58,649	303,479	20,088		2,565	303,479	309,190	6,788	1,077
Wages and salaries	6		165,634		13,137		42,494	234,517	15,767		1,990	234,517	239,022	5,378	873
Employers' social contributions	7		44,513		4,604		16,155	68,962	4,321		575	68,962	70,168	1,410	204
Mixed income, net	8	0		0		0		33,516		0		33,516			
Life cycle surplus (+)/ deficit (-)	9		**0**		**0**		**-170,614**		**69,055**		**-5,354**		**-106,913**		
TRANSFER ACCOUNT															
Taxes less subsidies on products	10		-643		0	57,585	0		-397		0	57,585	60,261	2,676	0
Taxes on products	11					60,899						60,899	63,588	2,689	
Difference VAT imputed and received by GOV	12		643		0				397		0		1,040		
Subsidies on products	13					-3,314						-3,314	-3,327	-13	
Other taxes less subsidies on production & imports	14		206		765	2,859	-22		941		23	2,859	1,913	-946	0
Other taxes on production & imports	15		3,794		842	7,468	699		2,110		23	7,468	7,468	0	0
Other subsidies on production & imports	16		-3,588		-77	-4,609	-721		-1,169		0	-4,609	-5,555	-946	0
Current taxes on income, wealth, etc.	17		9,402		2,882	65,589	0		52,928		0	65,589	65,212	583	960
Taxes on income	18		9,402		2,882	58,869	0		46,298		0	58,869	58,582	583	870
Other current taxes	19		0		0	6,720	0		6,630		0	6,720	6,630	0	90
Net social contributions	20	4,901	0	52,896	0	99,609	0	374	156,222	46	0	157,826	156,222	284	1,888
Actual social contributions, pensions	21	0	0	52,552	0	0	0	0	51,729	0	0	52,552	51,729	0	823
Actual social contributions, public pensions	22	0	0	0	0	95,780	0	0	94,999	0	0	95,780	94,999	284	1,065
Imputed social contributions (unfunded pension funds)	23	4,901	0	344	0	3,829	0	374	9,494	46	0	9,494	9,494	0	0
Social benefits other than social transfers in kind	24	0	4,901	0	35,403	0	72,908	111,576	374	0	46	111,576	113,632	2,304	248
Social benefits, pensions	25	0	0	0	35,059	0	0	34,227	0	0	0	34,227	35,059	832	0
Social benefits, pensions and non-pensions	26	0	4,901	0	344	0	72,908	77,349	374	0	46	77,349	78,573	1,472	248
Social transfers in kind	27														
Other current transfers	28	2,720	4,276	15,790	15,790	103,567	111,464	22,160	25,703	6,214	3,259	150,451	160,492	15,890	5,849
Net non-life insurance premiums	29	0	2,632	14,316	1,474	0	304	0	11,738	0	40	14,316	16,188	2,040	168
Non-life insurance claims	30	2,632	0	1,474	14,316	304	0	11,738	0	40	0	16,188	14,316	168	2,040
Miscellaneous current transfers	31	88	1,644	0	0	103,263	111,160	10,422	13,965	6,174	3,219	119,947	129,988	13,682	3,641
Transfer surplus/deficit	32		**-10,958**		**14,611**		**144,837**		**-101,117**		**2,955**		**50,328**		**10,107**
ACCOUNT FOR ASSET BASED REVENUES															
Operating surplus, net	33	83,443		21,971		0		0		0		105,414			
Property income	34	49,155	63,025	174,271	183,434	18,738	11,244	42,016	13,743	375	13	284,555	271,459	154,743	167,839
Interest	35	11,841	16,028	87,268	83,241	3,102	11,233	9,598	12,741	291	13	112,100	123,256	62,104	50,948
Dividends	36	31,324	28,834	92,724	69,444	4,385	0	8,069	0	84	0	136,586	98,278	78,255	116,563
Withdrawals from income of quasi-corporations	37	0	1,505	170	8	250	0	1,310	706	0	0	1,730	2,219	706	217
Reinvested earnings on foreign direct investment	38	5,973	5,968	-5,891	7,398	0	0	0	0	0	0	82	13,366	13,366	82
Investment income attributable to insurance policy holders	39	0	0	0	23,311	0	0	23,028	0	0	0	23,028	23,311	312	29
Rent	40	17	10,690	0	32	11,001	11	11	296	0	0	11,029	11,029	0	0
Net Asset Based Revenues	41		**10,958**		**2,882**		**25,777**		**14,560**		**2,399**		**56,576**		**32,801**
SNA ADJUSTMENT AND BALANCING ITEMS															
Adjustment for the change in pension entitlements	42	0	0	-17,493	0	0	0	17,502	0	0	0	9	0	-9	0
Depreciation	43		46,744		4,128		16,957		20,982		233		89,044		
Value added, net	44		293,153		40,477		58,627		54,148		2,588		448,993		
GDP	45												599,338		
External balance of goods and services (imports - exports)	46														-50,349
Primary/ National Income	47		69,573		12,808		67,938		365,268		362		515,949		
Disposable Income, net (NTA)	48		58,615		9,926		152,331		281,653		3,317		505,842		
Disposable income, net (SNA)	49		58,615		27,419		152,331		264,151		3,317		505,833		
Saving, net (SNA)	50		58,615		9,926		-18,283		13,713		-2,037		61,934		-45,897

taken into account when deriving operating surplus and the use thereof in the life cycle deficit/surplus.

3. The Account for Asset-Based Revenues includes as transaction items Operating Surplus (line 33), Property income (lines 34-40) and also Net Saving of SNA (line 50). The balancing item of this account is Net Asset Based Revenue (line 41), which can be derived for each sector as the sum of Operating Surplus plus receipts less disbursements of Property income less Net Saving according to SNA. For the Public (=GOV) sector Net Asset Based Revenues is 25,777=0+(18,738-11,244)-(-18,283), and for the Total Economy 56,576=105,414+(284,555-271,459)-61,934.

The overall balance of the NTA is that the sum of the life cycle surplus/deficit plus the transfer surplus/deficit plus the Net asset Based Revenues is equal to zero (0). Thus the life cycle deficit is financed through a transfer surplus and net asset based revenues. This identity holds in the table for each sector, but is only relevant for the Total Economy, as only for this total the life cycle deficit can be derived. When using the figures in the table for the three surpluses/deficits the following identity holds for the Total Economy: -106,913+50,328+(56,576+9)=0.

In addition to the NTA balancing items mentioned, table 2 also includes the SNA balancing items as reference, at the end of the table (lines 42-50). However, as not all transaction items of SNA are used in the NTA framework, it is not possible to derive those in the same manner as was described above in section 3.2 for table 1. This affects in particular value added (line 44), which cannot be derived as in table 1 as the difference between output and intermediate consumption, as these items are not included in table 2. Instead, value added net is derived for each sector and for the total economy as the sum of value added components, i.e. compensation of employees (line 5), mixed income (line 8), taxes less subsidies on production (line 14), and operating surplus net (line 33). Thus, value added of the NFC sector is 293,153=210,147+0+(206-643[12])+83,443 and of the Total Economy is 448,993=309,190+33,516+(1,913-1,040)+105,414. Once value added is derived in this way, GDP and all other balancing items are derived in the same manner as was described for table 1.

3.3.1. HH sector versus Total Economy accounts, Links between flow accounts and Wealth estimates, Comment

Two general comments may be made on the scope of flows in the NTA framework. One is on the sector scope of the flows in the framework, and the other is on the scope of national wealth or changes therein.

Presently NTA covers all sector flows of the Total Economy of SNA, not only including those of the Household (HH) sector, but also those of the Non-Financial Corporate (NFC) sector (non-financial enterprises), the Financial Corporate (FC) sector (banks and insurance schemes and pension funds), the Government (GOV) sector, and the Non-Profit Institutions (NPI) sector. When age profiles are attached to those flows, it leads to many artificial imputations of age profiles, as in principle age profiles can only be realistically attached to flows to and from the HH sector. Examples of artificial age profiles are those

[12] In the case of the Netherlands, the difference for the NFC sector between VAT imputed and received by the GOV (643, line 10 in table 2), is deducted from taxes less subsidies on production (206, line 12, table 2). For the Total Economy this adjustment is 1040 and the taxes les subsidies on production are 1,913. See also footnote 9.

imputed in NTA for current transfers such as taxes paid by NFC's and FC's to the GOV sector, and for asset based incomes such as dividends paid out by NFC's and FC's, interest payments made by GOV and NFC's to FC's, etc. The question raised here is whether the NTA should be limited to HH sector[13] flows and not covering in detail counterpart and other flows of other sectors, in order to avoid unnecessary and artificial imputations of age profiles.

As data on stocks are difficult to come by, and as it is even more difficult to distribute stocks between age groups, the NTA takes for the time being as the next best option the use of flows that support Changes in Net Wealth, through labour income, transfers and asset based incomes. The saving concept that is compatible with this approach is not the SNA saving concept, but an adjusted saving concept, which is equal to SNA saving plus capital transfers received minus capital transfers paid (see section 4.6 below). This is the concept of saving that is used in the identity of I=S (Investment=Saving), to which reference is made in economic theory. In addition to Savings thus defined, SNA includes two more elements that support changes in National Wealth. The first one is caused by *revaluation of fixed assets* and the second one includes, what is called in SNA, *other changes in (fixed) assets*, covering the finding of new oil, gas and other natural resources and also changes that do not result from agreements between parties to transfer assets, but are unilateral and non-voluntary changes of assets between countries through nationalization and war related acts. One may even include in this concept, bequests in those cases that there are no explicit agreements between those leaving their wealth behind after death and those inheriting those assets.

Even when limiting itself to flows, NTA has not advanced sufficiently into covering and assigning age profiles to all flows identified above. For the time being it limits itself to the current flows up to SNA saving, and does not even cover capital transfers of SNA. As a result of this limited focus of NTA at present, its analysis is actually oriented to how life cycle deficit of different ages is "financed" through social and other current transfers and asset based revenues transferred between different ages (generations). As this type of analysis is done most easily for the corresponding HH sector flows, NTA may focus only on HH sector flows. As such focus would result in a much simpler framework that can be easily understood by non-NTA specialists, including national accountants, it is suggested that for now NTA indeed only deals with HH sector flows. It would avoid artificial imputations of age flows to counterpart flows of the HH sector and other flows between other sectors that have no counterpart in the HH sector. The effects of limiting the flows to the HH sector may be mitigated, by including saving of all sectors other than the HH sector, instead of including explicitly all transfer and asset based income components of those sectors. Age profiles may be assigned only to the savings of other sectors, and not to the underlying transfer and asset based income components that are summarized by saving of other sectors. This avoids imputing artificial age distributions to a large number of non-HH flows. At the same time, by including saving of other sectors, a link is established with the saving-investment identity used in economic theory referred to above.

[13] The reference to the HH sector in this section may be extended to the NPI sector, which could be considered as the community of HH's. This would be compatible with SNA practices in the past and still followed in many countries with limited data, in which the HH and NPI sectors are derived together as a residual.

The reason of the present NTA focus on the Total Economy is that its ultimate objective is to record National Wealth available to different generations (see section 1.1.6 of NTA Manual) , and this covers not only wealth of HH's, but also wealth managed by other sectors of the economy. Following that objective, age profiles should be assigned to National Wealth related concepts for the Total economy. National Wealth in NTA includes two components, i.e. the Stock of Fixed Assets of SNA and the new NTA concept of *National Transfer Wealth*. The first component is close to a similar SNA concept, which includes produced assets (buildings, roads, equipment, etc.) and non-produced assets, such as land, mineral resources and other natural resources. This National Wealth concept differs from another concept in SNA, i.e. National Worth, which is defined as the stock of Fixed Capital on which residents of the country have a claim. To arrive at National Worth, National Wealth is increased with financial assets of residents that are claims on the National Wealth of another country and reduced with financial liabilities that are claims of non-residents on the National Wealth of the country in question.[14] The question raised here is whether Transfer Wealth should be included in a Worth concept, rather than in a Wealth concept and that consequently the concept of Worth be used in NTA and not the concept of Wealth.

When focusing on inflows and outflows of the HH sector, changes in Transfer Wealth may be limited to transfer flows to and from that sector. HH wealth would then include all fixed assets of HH's, i.e. HH dwellings, land and also other produced assets such as machinery and equipment that is used by HH's in agricultural, service and other small-scale production processes managed by HH's. HH Worth may be higher or lower than HH Wealth, depending on whether HH's have financial claims (through the purchase of stocks and bonds) on fixed assets of other sectors or whether other sectors (through e.g. mortgages and bank loans) have claims on HH fixed assets. If the flows are extended to all sectors, by including saving of those sectors, as suggested above, a National Wealth concept is supported, which includes all fixed assets present in the country, and a National Worth would be higher than National Wealth if residents of the country have financial claims on fixed assets of other countries or lower if there are financial claims on the fixed assets in the country by residents of other countries.

Transfer wealth of NTA may be considered as an "institutionalized" claim (not a financial claim) on fixed assets, as rights on social benefits have been established by the GOV, either or not supported by social premiums. This NTA extension may be included in the worth concept and not in the wealth concept. If this is done, not the wealth concept should be used in NTA, but rather the worth concept. This could be the worth concept of the HH sector or the extended National Worth concept of the Total Economy. HH

[14] One should be aware that the National Worth (or, called in SNA, Net Worth) concept is an integral part of the SNA accounting system, but the National Wealth concept does not have a clear role in SNA analysis (see SNA 2008, paras. 13.4, which defines National Wealth and Worth, and 13.47, where National Wealth is related to environmental issues). Furthermore the SNA concept of Stock of Fixed assets (called here National Wealth) includes all non-produced and produced immovable capital goods, such as forests, mineral and water resources, but also produced assets, such as buildings, roads, etc. When the owner is a non-resident, the SNA imputes a notional resident production unit (SNA 2008, paras. 4.49-4.50 on notional resident units; paras. 10.56-10.60 & 10.170-10.172 on ownership of assets) for the user of the asset in a production process, while the non-resident owner holds a financial asset, which is a financial claim (liability) on the fixed assets in question (see paras. 17.327 for residence of land; 17.341 residence of mineral resource; 24.56-57 for residence of houses and other buildings). Movable produced assets are included as fixed assets of the country in which a significant part of production takes place, supported by these assets.

worth would then change if either the value of fixed assets of HH's changes, claims of other sectors on HH fixed assets change, claims of HH's on fixed assets of other sectors change or a combination. Such financial claims of other sectors on HH fixed assets may increase, if HH transfer wealth is negative, and HH worth decreases.

The same applies to National Worth: it would change if fixed assets present in the country change, and/or Transfer Wealth of the country changes and financial claims are created on the fixed assets of other countries or, vice versa, financial claims of residents of other countries on the fixed assets of the country in question are created. When natural resources of a country increase, as a result of "findings" of new gas, oil, wind, other energy resources or resources in general (e.g. knowledge, technology advances), this would result in increases in National Worth. On the other hand, imprudent uses of these resources may decrease National Worth of present and next generations in the long run. This may occur if the proceeds of fixed assets (produced and non-produced) are used for current consumption, and not reserved (depreciation and other) for new investments to replace or to maintain the exhausted assets. Net or National Worth may reduce further in the future, if this or future generations need to incur debt in order to replace or renovate the assets in the future.

4. A review of major concepts used in SNA and NTA

The NTA framework of table 2 has an accounting structure that is different from the SNA. However, the table uses SNA concepts and therefore the estimates in table 2 are not different from those in SNA table 1. Table 2 does not yet take into account NTA adjustments to SNA concepts. These adjustments are dealt with in the review of NTA and SNA concepts in the present section, which uses the estimates of table 2 to explain the differences between the concepts of the SNA and NTA, and also indicates how and why they differ due to different objectives of analysis.

4.1. Pension premiums and benefits

In SNA a distinction is made between pensions without funding and those with funding. For those without funding, premiums and claims are treated as social transfers, and for those with funding premiums and claims are treated alternatively as current transfers and as saving/dissaving. Disposable income of HH's is derived by deducting all premiums and adding all benefit payments of pensions, and saving of HH's is derived by only deducting respectively adding of premiums and benefits of non-funded schemes. The two alternative treatments of funded schemes are linked in the same HH sector accounts, by adding the item "Adjustment for the change in pension entitlements" (SNA 2008, section 9.A.4), which is the difference between premiums and benefits of funded pension schemes. The adjustment item effectively calculates HH saving before deduction of premiums and before addition of claims of funded pension schemes. The reason for including these alternative treatments in the SNA HH sector accounts is that in income distribution analysis all pensions, whether funded or not, should be reflected. At the same time in financial analysis, starting with saving, the premiums of funded schemes should be treated as savings of HH's and the benefit payments should be treated as dissaving by HH's. How this is done in accounting terms is shown in table 3a below. The figures in the table are the same as those in the corresponding lines of table 2.

The table presents SNA practices on the left hand side and NTA treatments on the right hand side, reflecting differences and similarities in treatments between SNA and NTA of social contributions and benefits of funded and unfunded schemes. The contributions of the funded pension schemes are presented in the table in the line of "actual social contributions, pensions" and the benefits of these schemes are presented in the line "social benefits, pensions". The contributions (51,729) are payments by HH's to the FC sector and the benefits are payments (34,227) by the FC sector to the HH sector. The transactions of non-funded pension and other social schemes are included in the table as "social contributions, non-pensions", "imputed social contributions", and "social benefits, non-pensions".

In the SNA, on the left hand side of the table, social contributions, paid (156,222=51,729+94,999+9,494) reduce and social benefits, received (111,576=34,227+77,349) increase disposable income of the HH sector (264,151). The counterparts of these social flows to and from the HH sector, are in the sectors that receive contributions and pay benefits of funded schemes (only FC sector) and unfunded schemes (all sectors). At the same time SNA treats contributions and benefits of funded schemes as saving and dissaving. It does this by adding the difference between payments and receipts of funded pension scheme contributions and benefits as an "Adjustment for the Change in Pension Entitlements" to Disposable Income, in order to derive saving. For the HH sector the "Adjustment for the Change in Pension Entitlements" is equal to the difference between contributions and benefits of pension funds (17,502=51,729-34,227) and for the FC sector, it has a similar value with an opposite sign (-17,493=35,059-52,552), as this sector includes the funded pension schemes. Saving of the HH sector is derived by adding the adjustment item and deducting final consumption from disposable income (13,713=264,151+17,502-267,940).

Table 3a Pension premiums and claims	S N A												N T A											
	NFC		FC		GOV		HH		NPI		ROW		NFC		FC		GOV		HH		NPI		ROW	
Data source: Statistics Netherlands, 2012 tentative data	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments
Social contributions and benefits in cash																								
Net social contributions	4,901	0	52,896	0	99,609	0	374	156,222	46	0	284	1,888	4,901	0	344	0	99,609	0	374	104,493	46	0	284	1,065
Actual social contributions, pensions	0	0	52,552	0	0	0	0	51,729	0	0	0	823												
Actual social contributions, non-pensions	0	0	0	0	95,780	0	0	94,999	0	0	284	1,065	0	0	0	0	95,780	0	0	94,999	0	0	284	1,065
Imputed social contributions	4,901	0	344	0	3,829	0	374	9,494	46	0	0	0	4,901	0	344	0	3,829	0	374	9,494	46	0	0	0
Social benefits other than social transfers in kind	0	4,901	0	35,403	0	72,908	111,576	374	0	46	2,304	248	0	4,901	0	344	0	72,908	77,349	374	0	46	1,472	248
Social benefits, pensions	0	0	0	35,059	0	0	34,227	0	0	0	832	0												
Social benefits, non-pensions	0	4,901	0	344	0	72,908	77,349	374	0	46	1,472	248	0	4,901	0	344	0	72,908	77,349	374	0	46	1,472	248
Disposable income		**58,615**		**27,419**		**152,331**		**264,151**		**3,317**		**0**		**58,615**		**9,926**		**152,331**		**281,653**		**3,317**		**0**
Adjustment for the change in pension entitlements	0		-17,493		0		17,502		0		9													
Final consumption		0		0		170,614		267,940		5,354		0		0		0		170,614		267,940		5,354		0
Saving		**58,615**		**9,926**		**-18,283**		**13,713**		**-2,037**		**-45,897**		**58,615**		**9,926**		**-18,283**		**13,713**		**-2,037**		**-45,897**

In NTA only the saving/dissaving treatment is followed for contributions and benefits of funded pension schemes. Thus contributions are not deducted and benefits not added, when calculating HH disposable income. In the present example therefore HH disposable income in NTA is equal to HH disposable income in SNA plus the "Adjustment for the Change in Pension Entitlements" (281,653=264,151+17,502). HH saving in NTA is obtained by deducting from HH disposable income only HH final consumption and this is the same as HH saving in SNA (13,713=281,653-267,940). Similar relations with opposite signs hold for the FC sector, where contributions of funded pension schemes are receipts and benefits are disbursements.

4.1.1. Alternative treatment of premiums and benefits of pension funds, Comment

One may argue that NTA should not follow the saving-dissaving treatment of SNA, but rather the alternative SNA treatment in which all pension premiums and pension benefits are considered as transfers. No distinction should be made in NTA between funded and unfunded pension schemes.

The reason for including in SNA two alternative treatments of pension contributions and benefits was that two types of analysis were served. On the one hand in income distribution analysis all pension benefits should be reflected as income, whether funded or not, as otherwise retirees would have no income when analyzing the income distribution in a country. At the same time in financial analysis, the premiums of funded schemes should be treated as savings of HH's and the benefit payments should be treated as dissaving by HH's; this treatment helps establishing a correct relation between saving and investment, which is one of the foundations of economic analysis.

As NTA analysis is very close to the income distribution analysis (between generations), all pension premiums and pension benefits may be considered as transfers. Participants in funded and unfunded pension schemes do not consider their contributions and benefits differently and age profiles between the two types of schemes would also be similar. The present NTA practice in which unfunded schemes give rise to transfers and funded ones to saving and dissaving might result in differences between age profiles of HH contributions and benefits of unfunded schemes, and HH saving, including the contributions and benefits of funded schemes. These differences in age profiles cannot be well justified.

There is another argument, which supports treating premiums and claims of unfunded and funded schemes in the same manner in NTA. This is related to the concept of Transfer Wealth, referred to in the sections 3.3 and 3.3.1 above. One may argue that transactions of both funded and unfunded schemes result in changes in Net Worth: The funded schemes affect Net Worth through financial arrangements of saving and dissaving and the unfunded schemes affect Net Worth through changes in Transfer Wealth, which are based on "institutional" arrangements. If those effects on Net Worth are similar, why not deal with contributions and benefits of both types of schemes in the same manner, i.e. as transfers?

If the transfer alternative is followed for the funded schemes, it would result in a distribution of disposable income that is in line with SNA, and in a saving concept that would differ from that of SNA. Alternative saving for HH's would be lower than SNA saving (13,713), as it is equal to SNA saving minus the "Adjustment for the Change in Pension Entitlements" (-3,789=13,713-17,502, if the data in table 3a are used). As the amounts of transfers received and paid would increase, depending on the difference between receipts and payments of funded schemes, the effects on Changes in Transfer Wealth could be positive or negative. At the same time, savings would change in the opposite direction.

4.2. HH final consumption and Social transfers in kind

Public transfers in kind are included among the transfer inflows of the NTA. They are presented in several tables of the NTA Manual (see e.g. the detailed NTA table in section 2.4.1), where they are included in Public Transfers, Education, Health and Other in-kind inflows and outflows. They are not explicitly dealt with in any part of the Manual, however, but in fact are the counterpart of Public

Consumption, Education, Health and Other than Health and Education. Their scope is different from that of SNA, as they reflect the full scope of GOV and NPI consumption, while in SNA only a part of GOV and NPI final consumption is transferred to an adapted HH actual final consumption concept, through social transfers in kind. The differences between the NTA and SNA concepts are reflected in the two sides of table 3b below with estimates based on table 2 above, and in the explanatory paragraphs below.

The social transfers-in-kind in SNA (left-hand side of table 3b) are closely related to the final consumption concepts that are defined in that system. SNA distinguishes between two types of final consumption concepts: The first one is final consumption *expenditure*, which includes individual and collective final consumption. A second concept is *actual* final consumption, in which all individual final consumption expenditure of GOV and NPI sectors is transferred to the HH sector. Actual final consumption of HH's (378,257=104,963+267,940+5,354) is higher than final consumption expenditure (267,940) of HH's, and actual final consumption of GOV (65,651=170,614-104,963) and NPI (0=5,354-5,354) is lower than final consumption expenditures of these sectors (170,614 and 5,354), including only collective final consumption expenditure. The distinction between collective and individual final consumption expenditure in the GOV sector is based on selected categories of COFOG (Classification Of Functions Of Government), mainly covering expenditures on education and health, which can be

Table 3b HH final Consumption and Social Transfers in kind	SNA						NTA					
	GOV		HH		NPI		GOV		HH		NPI	
Data source: Statistics Netherlands, 2012 tentative data	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments	Receipts	Disburse-ments
Disposable income, net	152,331		264,151		3,317		152,331		281,653		3,317	
Final consumption expenditure		170,614		267,940		5,354		170,614		267,940		5,354
Individual consumption expenditure		104,963		267,940		5,354						
Collective consumption expenditure		65,651				0						
Adjustment for the change in pension entitlements	0		17,502		0							
SNA saving, net		-18,283		13,713		-2,037		-18,283		13,713		-2,037
Social transfers in kind		104,963	110,317			5,354		170,614	175,968			5,354
Adjusted disposable income, net	47,368		374,468		-2,037		-18,283		457,621		-2,037	
Actual final consumption		65,651		378,257		0		0		443,908		0
Adjustment for the change in pension entitlements	0		17,502		0							
SNA saving, net		-18,283		13,713		-2,037		-18,283		13,713		-2,037

assigned to individuals, as they are beneficiaries of these expenditures. Collective final consumption expenditures are those that benefit the society as a whole and cannot be assigned to particular individuals; these include defense and police expenditures, as well as collective expenditures on the maintenance of roads and other infrastructure, management of buildings and also the general expenditures of GOV Ministries, including those general expenditures of the Ministries of Education and Health. The transfer of individual final consumption expenditure from the GOV and NPI sectors is accompanied by supporting transfers in kind of the same amount from GOV and NPI to HH's (110,317= 104,963+5,354). To reflect these social transfers in kind, SNA introduces a concept of "Adjusted Disposable Income", which is equal to Disposable income plus social transfers in kind. For the HH sector this is 374,468=264,151+110,317. Saving with or without using the concept of actual final consumption and adjusted disposable income does not change. Concepts of SNA saving and disposable income are the same as in table 3a and also the same as in the NTA framework of table 2; HH saving reflects the "Adjustment for the change in pension entitlements", as was explained in the previous section (4.1) and presented in table 3a.

The NTA concept of transfers in kind, illustrated on the right-hand side of table 3b is wider than the SNA concept. It does not only reflect the individual consumption that is transferred from the GOV and NPI sectors to the HH sector, but also the transfer of collective consumption from GOV to HH's. As a consequence, social transfers in kind to HH's are higher, i.e. 175,968 (=170,614+5,354). (Adjusted) Disposable Income of HH's is also higher than in SNA, i.e. 457,621=281,653+175,968 versus 374,468 in SNA, but GOV (adjusted) Disposable Income is lower (-18,283=152,331-170,614) than what it is in SNA (47,368). NTA saving, however, remains the same as in SNA for all three sectors.

4.2.1. Alternative scope of social transfers in kind, Comment

An alternative to NTA treatment would be to follow SNA, by measuring actual final consumption of HH's and only include individual and not collective final consumption of GOV and NPI in actual final consumption of HH's. This would bring NTA in line with international standards of national accounting, which were established after long deliberations in the 1993 and 2008 SNA reviews.

Thus, only age profiles would be assigned to individualizeable final consumption paid for by GOV and NPI sectors, and which might be different from the age profiles of the corresponding social transfers in kind, which is precisely what NTA wants to show. For collective final consumption of GOV and NPI sectors, imputed age profiles would not be different from those of corresponding social transfers, and therefore imputation of such transfers is not needed in NTA, as it would not affect NTA analysis. If this alternative is followed, actual final consumption, social transfers in kind and adjusted disposable income of HH's, GOV and NPI's would be the same as in SNA, as reflected on the left side of table 3b.

4.3.Non-market imputations in SNA and NTA

There are at least two types of non-market transactions for which imputations are made in NTA , and which play an important role in NTA analysis. One is the imputation of intra-HH transfers between generations that are not measured in the market and therefore imputed in NTA (see NTA Manual basic concepts in sections 2.2, and in section 7.4.3 and appendix G). The other are the social transfers in kind imputed to HH's for GOV and NPI consumption, discussed above (section 4.2) that give rise to a significant increase of the life cycle deficit and at the same time increase significantly the transfer surplus or reduce the transfer deficit. To these imputations therefore much attention is paid in the NTA Manual. On the other hand, little attention is paid to the significant impact of non-market components of SNA concepts of

Table 3c HH durables, other non-market output and mixed income	SNA		NTA with extended HH production boundary, including non-market HH services	
	HH		HH	
Data source: Statistics Netherlands, 2012 tentative data	Receipts	Disburse-ments	Receipts	Disburse-ments
HH Disposable income, net	**264,151**		**286,653**	
Mixed income, total	33,516		38,516	
Mixed income from owner-occupied dwelling servi	5,000		5,000	
Mixed income from services of HH durables			2,000	
Mixed income of within HH non-market production			3,000	
Mixed income from other non-market products	10,000		10,000	
Mixed income from market output	18,516		18,516	
Other disposable income	230,635		248,137	
HH Final consumption expenditure		**267,940**		**268,940**
Consumption of non-market products		**29,865**		**30,865**
Consumption of owner-occupied dwelling services		5,000		5,000
Consumption of services of HH durables				2,000
Minus: consumption of HH durables				-4,000
Consumption of within HH non-market services				3,000
Consumption of other non-market products		24,865		24,865
Consumption of market products		238,075		238,075
HH Adjustment for the change in pension entitlements	17,502			
HH Saving net		**13,713**		**17,713**

value added and consumption that are used in NTA. These imputations included in SNA (and therefore reflected in NTA) explain, however, a large part of mixed income, which in NTA is distributed between labour and capital income (see NTA Manual section 2.2 Conceptual elements of NTA).

The left hand side of table 3c presents a quantitative description of the scope of non-market transactions in SNA and shows how this scope in the core SNA has implications for SNA concepts such as value added, mixed income, HH final consumption, HH disposable income and HH saving. On the right hand side of the table is shown how NTA concepts would be affected if a full range of within-HH non-market activities would be incorporated in NTA, including those of HH durables.

The core SNA includes a considerable number of non-market activities, in particular non-market agricultural and informal activities. They are within the production boundary of SNA and generate the larger part of mixed income. Extending the production boundary further is generally done in gender-type SNA satellite accounting, in which the extended production boundary includes non-market within HH production activities, such as cooking, cleaning, child rearing, and also the services of HH durables, which were dealt with in a previous version of NTA. The 2008 SNA deals explicitly with these activities in a separate chapter on satellite accounting, which includes also guidelines on the scope of non-market HH activities.[15]

The core SNA on the left hand side of table 3c includes mixed income of (i) owner-occupied housing (5,000 in table 3c), (ii) other non-market activities that may include agricultural activities and informal activities (10,000) and also (iii) mixed income generated in market activities that are generally small-scale (18,516); total mixed income according to SNA is 33,516 (=5,000+10,000+ 18,516).

Counterpart of this in the core SNA are the elements of HH final consumption, which includes (i) consumption of owner-occupied dwelling services (5,000), (ii) consumption of other non-market products of agriculture and informal activities (24,865), in addition to (iii) consumption of market products (238,075). These elements are explicitly presented on the left hand side of table 3c, which is an extract from table 2. The major SNA HH aggregates of Disposable Income (264,151), Mixed Income (33,516), Final Consumption (267,940) and Saving (13,713=264,151-267,940+17,502) are included in the HH sector accounts of NTA framework table 2. These are all SNA aggregates, which include imputations for the whole range of HH non-market activities included in the core SNA.

On the right hand side of table 3c imputations are made for within-HH non-market production and consumption and those are related to an adjusted NTA concept of HH disposable income that would result if these within-HH non-market activities would be incorporated in NTA. NTA Mixed income of table 2 (33,516) is increased with mixed income of within-HH non-market production (3,000) and mixed income of the imputed service of household durables (2,000), resulting in an adjusted mixed income of 38,516 (=33,516+3,000+2,000). Disposable Income in NTA adjusted for mixed income of the within HH non-market production and the services of HH durables is 286,653(=264,151+2,000+3,000 +17,502). HH final consumption slightly increases as compared to the SNA concept, as within-HH non-market services (3,000) and services of HH durables (2,000) are added, but HH consumption of HH durables (-4,000) is

[15] See also Chapter 29 on Satellite accounts of the 2008 SNA, and in particular section 29.E.4 on unpaid HH activity.

deducted (268,940=267,940+3,000+2,000-4,000). NTA saving only increases as a consequence of the deduction of the purchase of HH durables from HH consumption. The other elements have no effect on HH saving, as the same amounts are added to mixed income on the one hand and to HH final consumption on the other, i.e. (17,713=13,713+(2,000-2,000) +(3,000-3,000)-(-4,000)).

Attention may also be drawn to the imputation of output for banks, called FISIM (Financial Intermediation Services Indirectly Measured), which may affect operating surplus. In this case, it is not the output of non-market activities that is imputed, but rather an imputation is made for "hidden" output. In banking practices, a part of the output of banks is explicitly reflected in service charges to their customers, but a much larger part is "hidden" in the difference between interest charges by banks for their financial services and lower interest that they pay to their depositors. As this difference is relatively large, SNA in its very early stage of development already made an imputation for this "hidden" service, based on the difference between interest received and paid. In the minds of those who suggested this treatment, the relative value of value added of banks after FISIM imputation would be more realistic in relation to value added of other producers. Until recently this imputed FISIM was added to output and operating surplus (not mixed income) of banks, in the calculation of value added by economic activities, and then deducted again in the calculation of GDP, in order not to reflect in this major SNA aggregate too many imputations and artificial flow values. In more recent recommendations of SNA 2008, the deduction from GDP has been eliminated and the imputation has been worked throughout the accounts. This affects in particular the interest received by banks, which is broken down into a service charge– FISIM-, which is added to value added as described, and the remaining part of interest receipts by banks, which is then lower for the amount of FISIM. For NTA both treatments are valid, as NTA derives its asset based income, by adding operating surplus to property income. Asset based income would not be affected: In the first treatment of FISIM, NTA should follow SNA by deducting FISIM to arrive at GDP and leaving interest income of banks unaffected, while in the second treatment, FISIM switches asset based income between operating surplus and interest income of banks and the total is not affected.

4.3.1. Scope of non-market imputations in NTA, Comment

Two comments may be made, i.e. one on the overall scope of non-market activities in SNA and therefore also in NTA, and two on the distinction within mixed income between labour and capital income.

With regard to the scope of non-market activities, it is clear from the tables presented above that the core SNA already includes a considerable element of non-market activities, including in particular non-market agricultural and informal activities. They are within the production boundary of SNA and generate the larger part of mixed income. Extending the production boundary further is generally done in SNA satellite accounting. Extending the production boundary of services to HH durables, (as was considered in an earlier version of NTA) is an accepted modification of SNA in satellite accounting. However, such extension is generally done as part of extending the production boundary of SNA to include non-market HH production activities, such as cooking, cleaning, child rearing, etc. and also in gender accounting. The income of HH durables is a logical part of an extended SNA analysis of market and non-market activities. Extending the NTA framework to non-market activities is very relevant as non-market activities have a very different age structure from market activities. Non-market activities may start earlier in age and may continue even in advanced ages, while market activities are typically limited

to the 15-64 age period as defined for the Economically Active Population (EAP). SNA has clear guidelines on the incorporation in satellite accounting of non-market HH activities, including the non-market output of services of HH durables. Also there is a large literature on this extension in SNA related literature.[16]

Further extending the scope of non-market activities in SNA immediately raises questions about valuation. In the case of agricultural production for own use, output is valued at market prices of products that are actually marketed. Value added and mixed income are derived indirectly as the difference between the (market) output value and any cost involved in generating this output for own use; the intermediate cost may include seeds, fertilizer and some small tools that may be used in agriculture. A similar treatment is accorded, when an imputation is made for rents of dwellings that are used by the owners themselves: Market prices of house rents are used to value the output of these services and mixed income is based implicitly on this valuation of owner-occupied dwelling services, for which most output, except for minor repairs to maintain the dwelling, will be included in mixed income of HH's. The same procedure is followed in SNA when SNA incorporates own account construction of housing, i.e. construction of their own house by HH members: The value of the constructed house is based on market prices of similar houses, and costs of construction are deducted to arrive at mixed income. This procedure may also be followed, when the production boundary of NTA is extended to non-market activities that are more typical of in-house work by HH members, such as cooking, cleaning, child care, education of the young, health care of the old, etc., i.e. use market prices for output of those services. This may lead, however, to values of mixed income that are unrealistic, as the HH members most probably would never be able to enter the market for these activities. Therefore some argue that instead of market prices, minimum wages be assigned to the labour activities of these HH members, which would result obviously in a much lower value added and output as well.

The second question raised here is the separation between labour and capital components of mixed income. NTA assigns a standard 2/3 component to labour income and 1/3 to capital income. Apart from conceptual questions about the 2/3 and 1/3 proportions for labour and capital income (see the comments in section 5.2.1 below), it raises the question whether this breakdown is relevant at all for mixed income generated in non-market activities. As in many of these non-market activities capital plays an insignificant role or no role at all, the 1/3 assignment of mixed income to capital is not correct, and instead all mixed income should be considered as labour income.

4.4. Global SNA and NTA balances

The SNA and NTA each have their global balances. In the SNA they are the identities between GDP based on production, income and expenditure approaches, and in the NTA there is the balance between the identities of the life cycle surplus/deficit, transfer surplus/deficit and the net asset based revenues. Each of those balances was already reviewed earlier in sections 3.2 and 3.3, where tables 1 and 2 were described. In tables 3d and 3e below is shown how those balances are affected by changes in NTA concepts.

[16] See also Chapter 29 on Satellite accounts of the 2008 SNA, and in particular section 29.E.4 on unpaid HH activity

The main identity of SNA is the GDP identity, which includes three approaches to GDP, i.e. deriving GDP as (i) the difference between output and value added (production approach), (ii) the sum of final expenditures (expenditure approach), and (iii) the sum of value added components (income approach). The production approach can only be based on the SNA framework of table 1, in which estimates are included on output and intermediate consumption. In the NTA framework of table 2 this information is not available. The two other approaches can be based on the NTA framework of table 2 and the resulting figures are presented in the first column of table 3d. GDP (599,338) is included in the middle of the table. The elements of the income approach are in the upper segment of the table. Thus value added net for the Total Economy is equal to the sum of Compensation of employees paid, Taxes less subsidies on production paid, Mixed income, net, Operating surplus net, i.e. 448,993=309,190+873[17]+33,516 +105,414, and GDP is equal to the sum of value added net of the Total Economy plus Depreciation, and Taxes less subsidies on products paid, or 599,338=448,993+89,044+61,301[18]. The expenditure approach is reflected in the lower part of table 3d. There GDP is the sum of Final consumption, Gross capital formation, Exports, less Imports, or 599,338=443,908+105,081+527,583-477,234.

The first SNA column is fully based on the figures presented in the receipts and disbursements columns for the Total Economy of table 2. Social transfers in kind as defined in table 3b of section 4.2 (110,317) are added to the SNA column of table 3e as transfer inflows of HH's and transfer outflows of GOV and NPI's. Property income is presented in the SNA column of table 3e as the difference between receipts and disbursements (13,096=284,555-271,459). The NTA identities are also reflected in the figures in the first column of table 3e. In this column only SNA figures are used and no NTA adjustments have been made to SNA concepts.

It should be noted here that some of the common items between tables 3d and 3e have different figures in the SNA column of each table: Taxes less subsidies on products in table 3d refer to outlays (61,301), while in table 3e under Transfer inflows (57,585) they refer to GOV revenues. Compensation of employees in table 3d (309,190) refers to outlays by national producers, and in table 3e refers to receipts by HH's (303,479); the difference refers to compensation of employees of migrant workers (ROW). Similarly, taxes less subsidies on production represent outlays by producers in table 3d (873), and receipts by the GOV sector as transfer inflows in table 3e (2,859).[19] The only common items between the SNA columns of tables 3d and 3e with the same figure are final consumption (443,908) and mixed income (33,516) and operating surplus (105,414).

The figures after adjustment to NTA are presented in the last column of both tables. Three of the SNA-NTA adjustments affect the NTA values in the last columns of both tables:

1. An important change introduced in the NTA is the change of the market price valuation of HH final consumption to a valuation in basic prices: Taxes on products (61,301) are deducted therefore in

[17] From taxes less subsidies on production is deducted an adjustment item for the difference between VAT imputed and received by the GOV sector (873=1,913-1,040). See footnote 9.

[18] To taxes less subsidies on products is added an adjustment item for the difference between VAT imputed and received by the GOV sector (61,301=60,261+1,040). See also footnote 9.

[19] The large difference between Taxes less subsidies on production between payments in table 3d (873) and receipts in table 3e (2,859), is caused by the VAT adjustment item (1,040, see also footnote 9) and the large amount of subsidies that is received by ROW producers (946).

table 3d from HH final consumption and this then decreases from 443,908 to 382,607. This decreases for the same amount GDP from 599,338 to 538,037, i.e. from a valuation in market prices to a valuation in basic prices.

2. Mixed income is separated between labour and capital income in table 3e, where the NTA balances are derived. It is assumed here that of Mixed income (33,516), 66.67% is labour income ((-) 11,172) is deducted from labour income) and 33.3% is capital income (the same 11,172 is added to capital income). This decreases the life cycle deficit (from -106,913 to -54,460) resulting from a slight decrease of labour income (from 336,995 to 328,147) and a much larger reduction of final consumption from market to basic prices (from 443,908 to 382,607). On the other hand, net asset based revenues are increased (from 56,576 to 68,283) due to an increase in operating surplus (from 105,414 to 117,121).

66.67% Labour component of mixed income	SNA	NTA	
81.30% Labour component of production taxes less subsidies		NTA changes to SNA	
e 3d SNA GDP identity		HH final consumption excl. product taxes less subsidies	NTA estimates
ce: Statistics Netherlands, 2012 tentative data			
added, net	448,993		448,993
mpensation of employees, paid	309,190		309,190
xes less subsidies on production	873		873
xed income, net	33,516		33,516
erating surplus, net	105,414		105,414
ciation	89,044		89,044
less subsidies on products	61,301	-61,301	0
	599,338	-61,301	538,037
al consumption	443,908	-61,301	382,607
HH final consumption	267,940	-61,301	206,639
GOV final consumption	170,614		170,614
NPI final consumption	5,354		5,354
oss capital formation	105,081		105,081
ports	527,583		527,583
s: Imports	477,234		477,234

Table 3e NTA life cycle, transfer and asset based identities Data source: Statistics Netherlands, 2012 tentative data	SNA	NTA changes to SNA		NTA		
	Total Economy	Mixed income shifted to operating surplus	Production taxes less subsidies distributed between labour and capital income	Total Economy	PUBLIC transfers and asset based revenues	PRIVATE transfers and asset based revenues
Life cycle surplus/deficit	**-106,913**			**-54,460**		
Labour income, received	336,995			328,147		
Compensation of employees, received	303,479		2,324	305,803		
Mixed income	33,516	-11,172		22,344		
Final consumption	443,908			382,607		
Transfer surplus	**50,328**			**-13,823**	**-12,206**	**-1,617**
Transfer inflows	**656,203**			**632,216**	**582,607**	**49,609**
Taxes less subsidies on production and imports, received by GOV	60,444			57,585	57,585	0
Taxes less subsidies on products, received by GOV	57,585			57,585	57,585	
Taxes less subsidies on production, received by GOV	2,859		-2,859	0		
Current taxes, received by GOV	65,589			65,589	65,589	
Social contributions, received by NFC, FC, GOV, HH, NPI	157,826			105,274	99,609	5,665
Social benefits, received by HH	111,576			77,349	71,542	5,807
Social transfers in kind, received by HH's	110,317			175,968	170,614	5,354
Other current transfers, received	150,451			150,451	117,667	32,784
Net non-life insurance premiums	14,316			14,316	266	14,050
Non-life insurance claims	16,188			16,188	304	15,884
Miscellaneous current transfers	119,947			119,947	117,097	2,850
Transfer outflows	**605,875**			**646,039**	**594,812**	**51,227**
Taxes less subsidies on products, paid				61,301	61,301	
Current taxes, paid by NFC, FC, HH, NPI	65,212			65,212	65,212	
Social contributions, paid by HH	156,222			104,493	98,544	5,949
Social benefits, paid by NFC, FC, GOV, HH, NPI	113,632			78,573	72,908	5,665
Social transfers in kind, paid by GOV and NPI	110,317			175,968	170,614	5,354
Other current transfers, paid	160,492			160,492	126,233	34,259
Net non-life insurance premiums	16,188			16,188	304	15,884
Non-life insurance claims	14,316			14,316	266	14,050
Miscellaneous current transfers	129,988			129,988	125,663	4,325
Adjustment for the change in pension entitlements	**9**					
Net asset based revenues	**56,576**			**68,283**	**28,636**	**39,647**
Operating surplus, net	105,414	11,172	535	117,121		117,121
Property income, receipts less expenditures	13,096			13,096	7,494	5,602
less: Saving net	-61,934			-61,934	21,142	-83,076

3. Production taxes less subsidies, received by the GOV sector (2,859) are also distributed in NTA between labour income and capital income; this is reflected in table 3e. It has been assumed there that 81.3% is labour income (2,324) and 18.7% (535) is capital income. This reduces the life cycle deficit, as labour income is increased, and also increases the net asset based revenues, as capital income is also increased. The transfer surplus is reduced, as the elimination of these taxes reduces the transfer inflows.

The table includes two additional columns showing Public and Private inflows and outflows of transfers and asset based revenues. Derivation of those NTA estimates is discussed in section 4.5 below.

4.4.1. HH final consumption not in basic prices, but in market prices, Comment

There are two comments that may be made with regard to the above. The first one is that only conceptually, and not practically, it should be determined which taxes less subsidies on production received by the GOV are assigned to labour income and which ones should be considered capital income.

The second comment is that HH final consumption should not be valued in basic prices, excluding product taxes less subsidies, but rather in market prices as is recommended in SNA 1993 and 2008. If that is done, the transfer outflow of taxes less subsidies on products (61,301) may be eliminated from transfer outflows in table 3e, as the amount will be included in the value of HH final consumption presented under the life cycle deficit.

As regards the breakdown of taxes less subsidies on production, they should be based on clear concepts of what to include in labour income and what to assign to capital income and not based on a percentage breakdown, as is done in NTA. What type of taxes less subsidies should be considered labour income and what type of taxes are capital incomes. In the SNA the type of taxes and subsidies (SNA 2008, section CH. 7, section C.3 and D.2) include: (a) Taxes and subsidies on payroll and work force, (b) recurrent taxes on buildings, land and other structures, (c) business and professional licenses, (d) Taxes on the use of fixed assets or other activities, (e) stamp taxes, (f) taxes on pollution and subsidies to reduce pollution, (g) Taxes on international transactions. Using this list, taxes and subsidies under (a) may be treated as labour income, and the remaining ones --mainly related to business taxes and subsidies--, as capital income. Which components to include as labour income should be clearly spelled out in the NTA, rather than using artificial percentages. This is the same argument as was referred to in the split of mixed income above (see comments in section 4.3.1 above) and the need to develop NTA as a conceptual construct separate from compiling the NTA, as will be discussed in the comments in section 5.2 below.

With regard to the second issue, some comments on the how and why of the SNA treatment may be given here. SNA distinguishes between product taxes and subsidies and other taxes and subsidies on production. The product taxes and subsidies are levied on, respectively granted to specific products, and other taxes and subsidies on production are levied on/granted to establishments that may produce several products. Product taxes and subsidies are classified by products (according to CPC, Central Product Classification), while other taxes on production are classified by groups of establishments, called industries (according to ISIC, International Standard Classification of Industries) in SNA.

Product taxes include in SNA, among others, VAT, turnover taxes, excise taxes on alcohol beverages, cigarettes, etc., and also taxes on imports and exports. Product subsidies paid by the GOV are most often on food products, transport services, etc. They may also take the form of export and import subsidies, or GOV paying for the losses of some establishments. Other taxes and subsidies on production include among others payments for business licenses, pollution taxes, taxes on international transactions, on currency exchanges, on monopolies.

The product and other production taxes and subsidies play a role in defining two types of prices of products in the SNA, i.e. basic prices and market prices. Basic prices are the prices charged by producers or charged at the time of imports; market prices are the prices at which products are purchased. Other taxes and subsidies charged/granted to industries are reflected in the basic prices. Product taxes and subsidies are not reflected in the basic prices, only in the market prices. The market prices, in addition to including these taxes and subsidies, also include trade and transport margins, which are not reflected in the basic prices. Thus market prices are higher than basic prices, when product taxes are charged, and lower when product subsidies are granted. Basic prices in SNA are therefore used only to value output of

industries and imports, and market prices are used to value intermediate and final use, including HH final consumption expenditure.

This SNA treatment was introduced starting with the 1993 SNA. In the 1968 SNA basic prices were used to value all product flows, including HH final consumption and other intermediate and final uses. In the 1968 SNA, values of intermediate and final uses were adjusted for product taxes and subsidies in a manner similar to what is suggested in NTA, but not the same, as NTA also makes adjustments for other taxes and subsidies on production, and NTA does not make adjustments for trade and transport margins, as SNA does. As a result, NTA introduces a valuation for HH final consumption that is more distant than basic prices from the market prices that consumers actually pay. The basic price valuation of intermediate and final uses, including HH final consumption, was discontinued in the 1993 SNA, as it was considered not only impractical, but also conceptually incorrect, as it is not clear from which products to deduct the taxes and add the subsidies, as such taxes and subsidies are generally charged/granted ("transferred") to the next stages of production, depending on market conditions. The sectors paying those taxes are merely the administrative channels through which these taxes and subsidies are paid by/ received from the GOV, but do not actually reflect the sector ultimately bearing the cost of those taxes or benefits of the subsidies. Furthermore market prices, and not basic prices, "clear" the market, i.e. balance supply and use of products in the market.

In our view SNA considerations outlined above also hold for NTA, when distributing HH final consumption to age groups. The age groups "pay" for products at market prices and not at basic prices. Also, in this treatment, age profiles only need to be applied once to the taxes less subsidies on products, i.e. only when the GOV receives those, and not when they are paid, because payments are already included as part of HH final consumption.

4.5. Distinguishing in NTA between public and private flows

In table 3e in section 4.4 above the transfer surplus and asset based revenues are presented not only for the Total Economy, but also an NTA distinction is made in the last two columns between public and private flows of transfers and asset based revenues. As this is an essential part of NTA analysis, it is explained here how this is done in NTA. It is illustrated with an example that uses the "miscellaneous transfers" on line 31 of table 2, and which are presented in detail in the transfer matrix of table 4.

Table 4 Miscellaneous current transfers: Total row/column detail based on row 31 of table 2

Data source: Statistics Netherlands, 2012 tentative data		TO pub	TO priv	TO row	Total	
	FROM pub	85,625	13,834	11,700	**111,160**	*83.19%*
	FROM priv	14,503	2,343	1,982	**18,828**	*14.09%*
	FROM row	3,135	506	-	**3,641**	*2.72%*
	Total	**103,263**	**16,684**	**13,682**	**133,629**	*100.00%*
		77.28%	*12.49%*	*10.24%*	*100.00%*	

The row totals of the matrix are based on the receipts in line 31 of table 2 and the column totals on the disbursements in this row. The totals of Public plus Private miscellaneous transfers are reproduced as inflows and outflows in the first NTA column of table 3e in section 4.4. Sector estimates are aggregated in the transfer matrix of table 4 to the major groups, i.e. GOV, Private and ROW. The Private sector includes the NFC, FC, HH and NPI sectors of the SNA. Private receipt and expenditure totals in table 4 are aggregates of miscellaneous transfers of private sectors in table 2 (line 31), i.e. 16,684=88+0+10,422+6,174 and 18,828=1,644+0+13,965+3,219; public sector totals 103,263 and 111,160 refer to the GOV receipts and disbursements, and 13,682 and 3,641 to receipts and expenditures of the ROW in table 2. For row and

column totals % distributions are attached to the table. These % distributions are used to estimate the internal cells by either using the % breakdown of the total column or row of the matrix. The remaining cell values are derived directly from row and column totals, either by blocking some of the cells for non-existing transfers, or as residuals, once % row or column distributions have been used to derive the values of some of the internal cells. How this is done in detail is explained in Chapter 4 of the NTA Manual. Alternatively additional cell detail may be derived from more detailed national accounts estimates.

Public sector inflows and outflows are, in the last two NTA columns of table 3e, flows that originate from or have as destination the GOV sector; Private inflows and outflows are only between Private sectors. This distinction can only be made with help of the internal cells of transfer matrices. For miscellaneous transfers in table 3e the total inflows are the sum of column totals in table 4 (119,947=103,263+16,684), and total outflows are the sum of row totals in table 4 (129,988=111,160+18,828). Public transfer inflows are defined to include the internal cells for miscellaneous transfers received by the public sector from all sectors plus the transfers received by the Private sector from the Public sector, i.e. 117,097=103,263+13,834. Public transfer outflows include all transfers paid by the Public sector plus transfers paid by the Private sectors to the Public sector, i.e. 125,663=111,160+14,503. Private transfer inflows include transfers received by the Private sector from the Private sector plus the transfers received by the Private sector from the ROW, i.e. 2,850= 2,343 + 506. Private sector outflows include the transfers paid by the Private sector to the Private sector plus the transfers paid by the Private sector to the ROW, i.e. 4,325=2,343+1,982. The same procedure is used to distinguish in table 3e between Public and Private inflows and outflows of other transfers, i.e. taxes, social contributions and benefits and premiums and benefits of non-life insurance schemes.

Not the same procedure is used for asset based revenues. They are broken down on the basis of the sectors that receive and pay. The total of property revenues less expenditures (13,096) in table 3e is assigned to Public and Private by measuring separately in table 2 (line 34) the difference between receipts and payments of property income for the GOV sector (7,494=18,738-11,244) and for the NFC, FC, HH and NPI sectors (5,602=(49,155-63,025)+(174,271-183,434)+(42,016-13,743)+(375-13)).

4.5.1. Alternative distinction between public and private inflows and outflows, Comment

One may question whether the procedure followed in NTA to distinguish Public and Private flows on the basis of inflows and outflows recorded in the inner cells of the transfer matrices, as explained above, is the most convenient one. This is not the distinction made in the SNA, which differentiates between Public and Private flows on the basis of paying and receiving sectors. This distinction is reflected in the marginal totals of the matrices and not in the inner cells. Thus all Public outflows in SNA are obtained by identifying all GOV payments, which for miscellaneous transfers of table 4 amounts to 111,160 (and not 125,663 as in NTA). In SNA Public inflows would be 103,263 (in NTA 117,097), Private inflows 16,684 (in NTA 2,850), and Private outflows 18,828 (in NTA 4,325). The SNA criteria are much easier to handle in the compilation and also much easier to explain than the NTA criteria. Furthermore, one wonders why the NTA distinction between Public and Private is only followed for transfers and not for property income, for which the SNA approach is used. As a result the distinction between Public and Private

saving is affected by different criteria that are used in the distinction between Public and Private for transfers and asset based revenues.

4.6. Scope of current transfers versus capital transfers in SNA

The distinction between current and capital transfers is very important in the NTA, as a means of delimiting the scope of current transfers that are included in the NTA (see also my comments in section 3.3). For the time being Wealth accounts and Balance Sheets are not included in NTA and therefore capital transfers are also excluded. In addition to the NTA criteria set forth in section 2.5 of the NTA Manual, it may be useful to highlight some of the SNA criteria and what is behind those (see SNA 2008, section 11.E).

In SNA capital transfers may be in cash, but much more often in kind. If the ownership of an asset (tangible, intangible, financial) is transferred between parties/sectors, a capital transfer is imputed as means of "paying" for the purchase of the capital asset. The amounts involved in capital transfers are often large, but this is not a condition; there is no threshold in the definition of capital transfers in the SNA.

The transfers in kind may include the unrequited transfer between parties of tangible capital, such as the change of ownership of defense and other equipment donated by GOV's, a house donated by parents to children or the unrequited transfer of ownership of hospitals between GOV and private parties. Also included is the transfer of intangible assets between parties, covering the ownership of enterprises, patents and copy rights, oil extraction rights, etc.

A capital transfer may also be imputed when financial assets are transferred between parties. The imputation of capital transfers is then needed in order to finance the purchase of the financial assets. Defaulting on a mortgage, with mutual consent between parties (banks and consumer) requires the imputation of a capital transfer. The same applies when GOV's agree to eliminate debt; capital transfers are then imputed in the external account. If defaulting on debt is only done unilaterally, the SNA does not create any capital transfer, as debt remains as it was.

When capital transfers are in cash, they need to be assigned to the purchase of a particular asset. If money is transferred between GOV's, or between individuals, with the specific condition that it is used for the purchase of a capital asset, the transfer should be treated as a capital transfer. GOV investment grants to a foreign country to finance the construction of a dam is a capital transfer, and also the transfer of funds to children for the purpose of buying a house. Also large payments by GOV or insurance companies for major damages to houses and other buildings may be considered as capital transfers. Furthermore may be included in capital transfers large donations by individuals to universities, research institutions, museums and other NPI's. Bequests or inheritances are not explicitly mentioned in SNA. It is clear, however, given the criteria given here, that flows should be considered as capital transfers, as they involve the transfer of ownership of funds from a deceased individual to other individuals.

Transactions should be recorded as capital transfers, if one of the parties considers them as capital transfers. Inheritance tax is an example of this. It is a capital transfer from the point of view of HH's and a current transfer from the point of view of the GOV; therefore in SNA it is treated as a capital transfer.

Also, if foreign aid from one country is covered by its regular budget and considered as a current transfer, while the funds are meant to be used for capital investments in the recipient country, they should be treated by both as a capital transfer. The same would apply to individuals, where one transfers current funds, but stipulates that a part is used to purchase a house; in that case the transfer for the house should be treated by both individuals as a capital transfer.

4.6.1. Alternative scope of capital and capital transfers in NTA and other satellite accounts

What is important is the link in SNA between the concept of capital and capital transfers. Thus, as fixed assets such as equipment, roads, buildings and also land and non-produced forests are treated in SNA as capital, also capital transfers may take place with regard to these assets. On the other hand, other items, such as R&D or human capital are not treated at present in SNA as assets, and therefore their change of ownership can also not be treated as a capital transfer. As a consequence, expenditures on health or education are not treated in SNA as capital formation, and also transfers of funds for education or for major medical treatments are not considered in the SNA as capital transfers. Funds transferred by parents to children for education are therefore not being considered in SNA as capital transfers, as education is not capital formation.

While these concepts are not treated as assets in SNA, they may be recognized as such in satellite accounts. For instance, human capital embedded in education or health may be treated as capital in education or health accounts. Thus, the scope of capital transfers is very dependent on changes in what is capital in satellite accounts. If human capital would be treated as capital in satellite accounts, transfers to finance this through education could be treated as capital transfers. Does section 1.1.3 of the NTA Manual imply that human capital is recognized in NTA in the future? If so, that would have a major impact on NTA concepts of capital transfers, which at present is not reflected in the NTA Manual. Also, if NTA changes HH durables to capital assets, as was suggested in a previous version of NTA, their transfer could also be treated as a capital transfer. The concept of capital transfers in satellite accounts may be different from that in SNA, but it is always closely related to the scope of capital.

5. SNA and NTA Compilation

When compiling NTA through SNA, there are three options. Which of those options to use, depends on data availability, and time, and expertise available for the compilation.

5.1. Three SNA-NTA compilation options

The three options to compile NTA through SNA are the following:

1. The first option, which can only be carried out if comprehensive SNA estimates are available, is to convert SNA to NTA, as described in the previous sections of this paper. As comprehensive availability of estimates may not necessarily be identical to what is described above, it may be necessary to adjust the framework to the comprehensive availability of SNA estimates in each country. For some variables more detailed estimates may be available than was described in the SNA framework of table 1 above, and for other variables fewer estimates may be available. The reader should be reminded that in the SNA-NTA conversion described above, not all SNA detail was used. In practice therefore more detail may

be used in the conversion of SNA and this would result in a revised framework, for SNA-NTA conversion. Once SNA estimates have been converted to NTA, age profiles may be applied to the converted variables, and micro totals based on detailed age profiles may be adjusted to the levels of the NTA estimates based on SNA, as is described among others in the steps to follow in section 3.3.2 of the NTA Manual.

2. The second option applies when only limited SNA estimates are available, generally restricted in many countries to GDP and its breakdowns. It will be shown in section 5.2 below how this set of SNA estimates can be made more complete with help of structural coefficients between estimates, generally based on previous year's SNA estimates that were more comprehensive, HH survey data, and other studies. This option assumes that not only GDP estimates are available, but that they are supplemented by GOV administrative records and balance of payments data for the ROW. In the compilation of this second option much use is made of the SNA identities that were earlier described in section 3.2. Once a complete set of SNA estimates is available, they will be converted to NTA format as in table 2 and thereafter NTA adjustments will be applied, as described in the previous section (4).

3. The third option is to re-compile SNA, taking into account the micro HH sector data that are used in NTA and that are not taken into account in conventional SNA compilation. For instance, NTA uses HH surveys more extensively (see section 5.3.1 of the NTA Manual), deriving HH data on homes, consumer durables and pensions, and specifications by age profiles of HH flows. The NTA compilation would thus result in some additional estimates of HH flows, which need to be incorporated in the SNA type compilation. This would then require a re-compilation and possibly revision of the SNA estimates, as the conventional SNA estimates did not take these micro data into account. Once the SNA is re-compiled and has resulted in comprehensive SNA estimates, these can be converted to NTA format, as described in the previous sections of this document. When pursuing this option, SNA estimates, in particular, of HH sector accounts may be revised in the light of the new information on HH variables. The re-compilation option is generally only applicable if comprehensive or near-comprehensive SNA estimates are available and inconsistencies are generated with existing SNA estimates, when NTA specialists introduce additional micro data mainly based on HH surveys. The re-compilation is not an option if very limited data are available (option 2 above) and thus very few inconsistencies are generated between available estimates and new data. Re-compilation of SNA is a labour intensive option, which may only be applied, with much support of national accountants, and may only be worthwhile if a sufficient number of additional data have become available.

Only the second option with limited SNA estimates will be described in the next section. The first option has already been described in detail in the previous sections.

5.2. NTA compilation based on limited SNA estimates and other data

Compiling the NTA with a limited SNA set of estimates may take as point of departure three limited sets of SNA estimates of GDP and its breakdowns:

1. The most limited set of SNA estimates only includes estimates of GDP by economic activities (i.e. ISIC categories and subcategories on agriculture, mining, manufacturing, trade and transport, financial public administration and other services). The countries compiling these estimates use the production

approach to GDP, by collecting data on output and assuming that the relation between output and value added does not change alternatively in constant prices or current prices. As GDP is in market prices and value added of each activity is in basic prices, there is generally available an estimate for product taxes less subsidies, which is one of the elements of NTA.

2. The second more extended GDP estimates include in addition to the activity breakdown also a breakdown of GDP by expenditures, i.e. showing separate figures for final consumption, capital formation and exports less imports. In this expenditure approach, national accountants incorporate estimates of imports and exports based on foreign trade statistics and balance of payments figures, and identify in detail the elements of products destined for capital formation that are included in imports (most capital goods are imported in many countries) and in output (mainly output of construction). Private final consumption in market prices is an element that is used in NTA. It is derived in SNA either or not as a residual between GDP based on the production approach and the expenditure elements of exports minus imports and capital formation that are estimated separately.

3. In the third most extensive compilation of GDP is used a combination of the previous production, and expenditure approaches with an income approach to GDP. The income approach estimates the income components of GDP, i.e. compensation of employees, other taxes on production less subsidies and operating surplus. It should be noted that in most countries following this extended approach to GDP, mixed income is not separated from operating surplus and operating surplus is gross without deducting depreciation. These are two limitations, which need to be resolved when using these extended GDP figures in NTA.

To arrive on the basis of the limited GDP estimates at the elements needed in NTA, four steps are needed. Some of those steps may require intensive cooperation between NTA and SNA specialists.

1. First GOV sector estimates should be compiled as reflected in the GOV sector column of table 1. They may be based on GOV administrative records or on GFS data, as is explained in section 6.2 of the NTA Manual. This information supports the Public sector variables in the GOV sector column of table 1. Intensive cooperation between SNA and NTA specialists is needed to accomplish this compilation.

2. Secondly, Balance of Payments data, available for most countries, may be converted to the ROW accounts in table 1. Detailed instructions on how to do this are contained in the IMF Balance of Payments Manual.20 However, intensive cooperation between SNA and NTA specialists may be needed to convert the BOP figures to SNA. This data source is not identified in the NTA Manual.

3. Thirdly, HH survey data should be used, as is described in section 5.3.1 of the NTA Manual. This data source may generate in particular data on HH final consumption and on compensation of employees, which would not be available, if only the production approach to GDP is used. If the very extensive GDP approach is used as described above, separate estimates of compensation of employees and HH final consumption are already available from the SNA estimates, and the HH survey would only provide the age profile of these estimates.

4. The fourth step would be to estimate the remaining SNA elements that are needed for NTA with help of assumed relations between available SNA estimates and those that need to be estimated

[20] See in particular appendix I of "International Monetary Fund, Balance of Payments Manual, 5th edition, (English edition November 2005), ISBN 1-55775-365-2".

additionally. These so-called "structural relations" could be obtained from (i) SNA estimates in the past, when very detailed benchmark estimates were compiled by national accountants, and/or from (ii) special ad hoc studies.

Below are indicated which estimates of variables are available through steps 1-3 above, and which need to be estimated in step 4. In the case of variables estimated in step 4, is indicated what types of assumptions about coefficients and other relationship structures, as well as SNA and NTA identities, could be used in the compilation of these variables:

1. The starting point of the SNA-NTA compilation when only limited SNA estimates are used, is in most cases GDP and the sum of value added. As in most countries at least the production approach is followed, it is almost always possible to arrive not only at GDP, but also at the total of value added. The latter is the value before adding product taxes less subsidies and before deducting an imputed bank service charge made in SNA (called FISIM, see **Error! Reference source not found.**). For purposes of NTA, product taxes less subsidies should be added , even though GDP and value added are not explicitly included in NTA. However, as one of the GDP expenditure counterparts of final consumption is included in NTA in market prices, the starting point of NTA compilation based on limited GDP data, should be GDP including the product taxes less subsidies. FISIM should be deducted to arrive at GDP, if the country follows the earlier SNA treatment; if the 2008 SNA is followed by the country, NTA may use the revised SNA concepts of value added and interest received by banks, as asset based income is not affected; this was explained in the earlier section. Furthermore, all income concepts in NTA should be net of depreciation. Thus, when starting from GDP, first an estimate should be made of depreciation, which is then deducted from GDP.

2. Labour income in NTA includes compensation of employees and part of SNA mixed income. Compensation of employees would be available if the income approach to GDP is used in national accounting. If only the production and expenditure approaches are used, this information will not be generated by national accounting. In that case HH survey data may be used to construct this item. The HH survey data include data on employment of employees, as well as data on average remuneration of employees. This information may then be used, either or not in cooperation with national accountants, to make estimates of compensation of employees. If past SNA estimates are available on the value added components, the structural breakdown of value added may be used to construct the required estimates of compensation of employees, either or not in combination with HH survey data. The structural information on value added components in the UN SNA 2008 figures is reflected in table 5a. In this case compensation of employees is 68.86% of value added, and this percentage may be applied to total value added (i.e. GDP minus product taxes less subsidies), which results from the production approach to GDP.

Table 5a Value added components

Compensation of empoloyees	Other taxes less subsidies	Mixed income	Operating surplus, net
68.86%	0.19%	7.46%	23.48%
		24.12%	75.88%

3. Operating surplus, including mixed income is generally available from an income approach to GDP. In such approach mixed income is not separated, as there is no information on what part of operating surplus, including mixed income is generated in small HH sector enterprises. Such information generally is only available if full sector accounts are developed in SNA. If the income approach to GDP is

not followed in national accounting, the two elements need to be estimated in the context of NTA. The most obvious method would be to apply, based on past benchmark or other national accounts compilations, the value added coefficients of operating surplus and mixed income, as presented in table 5a, to the sum of value added (before addition of product taxes less subsidies) obtained from a production approach to GDP. This would result in SNA mixed income and value added, which then needs to be adapted for NTA purposes to arrive at adjusted versions of mixed income and operating surplus, as was explained above in the comments in section 4.3.1, and in section 4.4. There is hardly any alternative approach, as it is very difficult to get reliable data on mixed income from HH surveys. In some countries, small scale production surveys may have been held, which might provide information on mixed income.

4. The two elements of production taxes less subsidies are fully measured, when using GOV administrative records in the compilation of GOV sector accounts, as suggested above. In table 1 they refer to the receipts by GOV of product taxes less subsidies, which are levied on the value or volume of output and imports of products (goods and services) and to other production taxes, which are levied on the output of establishments that produce goods and services.

5. For current taxes on income and wealth, both receipts and expenditures are needed. Data on the receipt of current taxes on income, wealth, etc. can be obtained from GOV administrative records. The payments of these taxes by sectors can be derived from the receipts, based on GOV administrative records, by deducting the disbursements of these taxes by the ROW and adding the receipts of those taxes by the ROW. No other breakdown of these flows is needed.

6. The remaining SNA flows are estimated, using the type of transaction matrices (see section 4.4.3 of the NTA Manual) corresponding to social contributions and benefits, non–life insurance premiums and claims, miscellaneous current transfers and also property income. How the transaction matrices for these flows are used, when limited data and estimates are available, may be illustrated for one of the flows, i.e. miscellaneous current transfers. The transfer matrix for this flow is reproduced in matrix 5b. In the matrix inflows and outflows are available as column and row totals for the Public (=GOV) sector and for the ROW. No estimates are available for the Private row and column totals; and also internal cells are empty. Estimates need to be made for all totals and internal cells and this was done, using the % distributions of row and column totals, which may have been derived from a benchmark or other previous year SNA compilation. For example, the Private row and column totals could be derived by using the % distribution corresponding to the totals of the missing row/column in relation to the % distribution of the columns for which column totals are available. If (111,160+3,641) is (83.19%+2.72%) of the total of inflows in the last column, the total inflow is 133,629 (=(111,160+3,641)/ (83.19%+2.72%)) and the total private inflows are 18,828 (=133,629-111,160-3,641). As the total inflow is also equal to the total of outflows in the last row, the total of private outflows is 16,684 (=133,629-103,263-13,682). Thus, all row and column totals are estimated, and values in the internal cells can be derived in the same manner as this was described in section 4.5 above for miscellaneous transfers. The same can be achieved for the other flows mentioned above. It should be noted here, though, that some of the flows could be based directly on actual administrative records or other actual data. This may apply to the social contributions and premiums paid to and received from

Table 5b Transfer matrices for selected flows, limited information

Miscellaneous current transfers: Total row/column detail based on row 31 of table 2

		TO pub	TO priv	TO row	Total	
	FROM pub				**111,160**	*83.19%*
	FROM priv					*14.09%*
	FROM row				**3,641**	*2.72%*
	Total	**103,263**		**13,682**		*100.68%*
		77.28%	*12.49%*	*10.24%*	*100.00%*	

non-GOV institutions dealing with social security and pension systems, which generally are few and maintain public information systems. The same may hold for non-life premiums and claims, on which information may be obtained from a few insurance companies which deal with this type of insurance; their number is also small and they may have good administrative records. The flows that cause more difficulties are miscellaneous transfers and property income, on which less systematic information is available.

5.2.1. NTA concepts and compilation, Comment

Two comments need to be made here. The first once concerns the relation between conceptual SNA-NTA links and the compilation of NTA through SNA. The second comment concerns the compilation procedure through SNA, as described in the 3 options mentioned earlier in section 5.1.

Conceptual links between and conversion from SNA to NTA should be separated from the compilation of NTA. This is not done in NTA, which mixes up NTA concepts with practical considerations, for instance in the 2/3 and 1/3 breakdown of mixed income between labour and capital income (see section 4.3.1 above) and also the percent breakdown of other taxes on production less subsidies between labour and capital income (see section 4.4.1 above). The present paper deals separately with the conceptual conversion from SNA to NTA in the previous sections and the compilation of NTA through SNA in this section. This is in line with the orientation of the 1993 and 2008 SNA, which are defined as frameworks with concepts that are independent of their compilation. Many parts of the SNA construct are not used by the majority of countries. Many countries only compile GDP estimates and do not deal with Integrated Economic Accounts, and most countries do not deal with the balance sheet accounts of the system. Nevertheless they are there worked out in conceptual format and ready for use by practitioners. It is suggested that the NTA follows a similar procedure and construct an NTA framework and concepts, without mixing those concepts with specific rules for the allocation of mixed income, or taxes less subsidies on production between labour and capital income. The percentages used are highly artificial and would need to be further examined on the basis of in-depth studies of the scope of mixed income and taxes less subsidies on production. This does not mean, however, that the concepts and their treatment in analysis cannot be established independently and before practical rules have been established.

It has been argued here that compilation of NTA should be done through SNA, in order to make optimal use of restrictions that are extensively used by national accountants, and add to the reliability of the NTA estimates. As was shown above, this procedure is particularly helpful when only limited SNA estimates are available and additional non-SNA data need to be used in order to derive all NTA estimates. The present NTA procedure to use SNA estimates as “macro-totals” to which micro NTA data for age profiles should be adjusted is not an optimal compilation procedure. Instead, SNA estimates may be improved and revised, by using the micro data that have not been used by national accountants when they compiled SNA estimates. This is the argument behind the third compilation option presented above. In SNA, the data from HH surveys are generally restricted to data on HH final consumption, data on employment and compensation of employees, and in some instances also data on small-scale production activities. The NTA uses HH surveys more extensively (see section 5.3.1 of the NTA Manual) and derives

e.g. also HH data on homes and consumer durables and pensions, but uses the HH survey in particular to arrive at age profiles of HH flows. The NTA compilation would thus result in additional estimates of HH flows, which need to be incorporated in the SNA type compilation.

The third compilation option of NTA through SNA is an ambitious option, which may not be easily feasible, unless extensive assistance is acquired from national accountants to re-compile the SNA, using the additional micro data. This option, however, would be feasible if use is made of a formalized and computerized Bayesian compilation approach, developed by the author21, and which simulates the more manual methods conventionally used in national accounting. The Bayesian estimation approach is a formalization of the conventional SNA compilation procedure. The approach includes three elements, i.e. one is the design of a compilation framework, two is the use of basic data, ratio values, identities and reliabilities in the estimation of all variables in the framework, and three a compilation software that was developed in parallel with the formalized Bayesian compilation approach. This Bayesian framework compilation approach may be applied to the NTA Satellite framework that was presented in section 3.3 above. In that case the ratio values may reflect age profiles that show what percentage of revenues and expenditures should be assigned to age groups. Ratios also include SNA relations for each age group between different variables per age group, and also SNA ratios between variables of the HH and other sectors, such as tax ratios, component structure of HH disposable income, propensity to consume, etc. The identities include among other the balances that should hold between the macro estimates and the estimates per age group, the SNA identities that should hold within age groups and between macro estimates, such as the definitions of disposable income and saving, the identity between the life cycle deficit and the sum of transfers, asset income reallocations and saving, etc. Also included are definitional identities such as the definition of saving, the definition of the life cycle deficit, etc. Furthermore should be attached reliabilities to all values of basic data and ratio values. These reliabilities should be set subjectively ex ante or as priors by NTA and/or SNA specialists.

The four elements of basic data, ratio values, identities and reliabilities of basic data and ratio values are used to arrive at optimal estimates of all variables in the framework (using a specialized computer software). The estimates of the variables may deviate somewhat from the values of basic data and ratios, taking into account the reliabilities of each. The optimal posterior estimates of variables and ratios are made by minimizing the total square differences between basic data and ratio values on the one hand and the Bayesian estimates on the other hand. In this optimization, 1/prior variance coefficients of basic data values and ratio values are used as weights, so that values with larger prior variances will be changed more in the posterior estimates than those with smaller prior variances. The posterior estimates will include estimates of variables and ratios and also posterior reliabilities of both. The posterior estimates will not necessarily coincide with the control totals that are the starting point of the present NTA compilation approach. Those control totals may actually change, depending on the prior reliabilities given to those data and estimates.

[21] Jan W. van Tongeren, “From National Accounting to the Design, Compilation, and Use of Bayesian Policy Analysis Frameworks”, Tilburg School of Economics and Management, CentER Dissertation Series Nr.295, Tilburg University, The Netherlands”, October 2011

The Bayesian approach may also be used to compile NTA through SNA when only limited data are available, as was discussed in section 5.2 above.