

Discussion Paper

Measuring Inequalities in the Dutch Household Sector

The views expressed in this paper are those of the author(s) and do not necessarily reflect the policies of Statistics Netherlands

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Summary: In recent years, the importance of the households sector in measuring economic welfare has increasingly been recognised, and the development of additional indicators to measure inequalities is suggested. This article reports the work done by Statistics Netherlands concerning the development of such indicators. National accounts data has been combined with distributional information to divide income, consumption and wealth over household groups. This paper presents the preliminary results for the standard of living.

Keywords: actual individual consumption, adjusted disposable income, households, inequalities, social transfers in kind, standard of living, wealth

Contents

1.	Introduction.....	4
1.1	Dutch background.....	4
1.2	Stiglitz, Sen, & Fitoussi.....	4
1.3	Paper organization.....	6
2.	Methodology.....	6
2.1	Definitions and scope.....	6
2.2	Data sources.....	9
2.3	Distributional technique.....	12
3.	Results.....	17
3.1	Equivalence scales.....	17
3.2	Distributions.....	18
3.3	Measures of inequality.....	23
4.	Conclusions.....	26
5.	Bibliography.....	28
6.	Annex A – household categories.....	29
7.	Annex B – definitions.....	31
8.	Annex C – methods.....	33
8.1	Income components.....	33
8.2	Consumption components.....	34
8.3	Social transfers in kind.....	35
8.4	Wealth components.....	35

1. Introduction

1.1 Dutch background

Over the years, we have seen an increased demand for coherent socio-economic statistical information. The National Accounts provide the coherent (macroeconomic) framework of income, consumption and wealth for the households sector as a whole. Many microeconomic statistics focus on the relevant socio-economic issues and the distribution of income, consumption and wealth over household groups.

Statistics Netherlands (SN) has a long history of integrating macroeconomic frameworks and the microeconomic statistics. The compilation of the Socio-economic Accounts was published nearly 25 years ago (Huigen, Van de Stadt, & Zeelenberg, 1989). These Socio-economic Accounts were closely related to the Social Accounting Matrices. For the Netherlands this Social Accounting Matrix (SAM) was developed in the early 90s (Timmerman & Van de Ven, 1994). Internationally, SAMs were popular for analysing labour markets in developing countries. The use and aim of the SAMs are described clearly in the Handbook on Social Accounting Matrices and Labour Accounts (2003). It states that:

“SAM elaborates on the interrelationship between economic and social statistics by linking together the (mainly) macro-statistics of national accounts with the (mainly) micro- statistics of the labour market and of households. (...) With these links and extra breakdowns, it is possible for the analyst to investigate economic and social policy issues within an integrated framework.” (Leadership Group SAM, 2003, p. 1)

In name, the Dutch SAM still exists, but the link with the labour market has been severed. Today, the socio-economic characteristics focus on households only. The SAMs, published annually, distribute income and consumption of the households sector over household groups, which are derived by a combination of main source of income and household composition (Statistics Netherlands, 2012). However, as it is published now, the SAM is less well suited for current users. This is because the number of household categories is limited, it lacks wealth distribution and the methodology can be improved. On the other hand, data are published annually and follow the national accounts publication calendar.

1.2 Stiglitz, Sen, & Fitoussi

In recent years, the distribution of household welfare has received renewed attention. In 2008, the French government initiated the set-up of the *Commission on the measurement of economic performance and social progress*. It has since long been recognized that GDP is not a perfect measure of economic performance, especially

when it concerns wellbeing and economic, environmental and social sustainability. The aim of the Commission was “to identify the limits of GDP as an indicator of economic performance and social progress, including the problems with its measurement; to consider what additional information might be required for the production of more relevant indicators of social progress; to assess the feasibility of alternative measurement tools, and to discuss how to present the statistical information in an appropriate way” (Stiglitz, Sen, & Fitoussi, 2009, p.7). This report is divided into three subjects (Classical GDP Issues, Quality of Life, and Sustainable Development and Environment), giving recommendations on each of the topics. The first topic, the Classical GDP Issues, focuses on the limitations of the national accounts. For this topic the report recommends:

1. When evaluating material well-being, look at income and consumption rather than production
2. Emphasise the household perspective
3. Consider income and consumption jointly with wealth
4. Give more prominence to the distribution of income, consumption and wealth
5. Broaden income measures to non-market activities (household production and leisure), resulting in full income

Following up on this report, and the Beyond GDP initiative (Commission of the European Communities, 2009), for each of the three subjects, a Task Force was set up to analyze how the European statistical system could meet the recommendations. For the Classical GDP Issues, the Task Force ‘Household Perspective’ was initiated. One of the four themes elaborated on by this Task Force was the distribution of household income, consumption and wealth. Recommendations by the Task Force were, among others (Sponsorship Group on Measuring Progress, Well-being and Sustainable Development, 2011, p.6):

- Set up a joint Eurostat/OECD expert group to implement this project in EU and non-EU countries.
- Work in parallel on (1) ‘*A minima*’ matching exercises based on the (harmonized) data available at Eurostat and (2) national pilot studies that take advantage of the full information available at that level.
- Provide a breakdown of income, consumption and saving rates by a number of household categories.

These recommendations of the Task Force were met by setting up an Expert Group on measuring Disparities in a national accounts framework (EG-DNA). The EG-DNA is to investigate the possibilities to go beyond the macro-economic data of depicting “average” households and to provide insight into distributional aspects. The Expert Group aims to assess whether it is possible to develop a harmonized framework for the distribution of household income, consumption and wealth. For this exercise, the participating countries used the preferred data sources at the

country level. At the same time, Eurostat carried out the *A minima* exercise, based upon harmonized data available at the European level, the so called EU-SILC dataset. The international attention led to several national statistical offices working on the breakdown (Braakmann & Schwahn, 2012; Australian Bureau of Statistics, 2013). The French Statistical Office (INSEE) led the way in this development, showing a breakdown of the 2003 national accounts (Accardo *et al*, 2009).

1.3 Paper organization

Statistics Netherlands also worked on the breakdown of households. The SAM needed to be improved and, at the same time, Statistics Netherlands also participated in the Expert Group. This paper summarizes the research carried out by Statistics Netherlands in this field and presents the annual results for the period 2005-2009. It must be borne in mind that these are the results obtained in the Dutch project, which differ from the results obtained in the Expert Group on some points. The reason for this is that different choices are made for the presentation of the results and the classifications that are used. The choices made in methodology are based on the work done in the Expert Group, but improved and expanded upon.

This paper is organized as follows: the next section discusses the methodology and focuses on the confrontation of the national accounts with the distributional information. Section 3 shows the results of the distribution over the household groups and the measures of inequality. This is done for one household category: the standard of living. Section 4 concludes.

2. Methodology

The aim of the project is to distribute the total income, consumption and wealth of the households sector over household groups and derive measures for inequalities within the scope of the National Accounts (NA) framework (Eurostat, 1995). This section discusses the methodology applied to achieve the distribution. The next subsection considers the definitions used and the scope of the project. Subsection 2.2 presents the data sources that are used and the method is presented in 2.3.

2.1 Definitions and scope

2.1.1 Households

The scope of the project is the households sector (S.14). This sector “*covers individuals or groups of individuals as consumers and possibly also as entrepreneurs producing market goods and non-financial and financial services*” (ESA 1995, §2.75). A household is defined as a “*group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and*

who consume certain types of goods and services collectively, mainly housing and food” (SNA 2008, §4.149).

The households sector is split up in household categories. Five categories are chosen, based upon wishes from (external) users and practical availability of the characteristics in the micro sources.

- Housing status
- Household composition
- Age of the head of the household
- Main source of income
- Standard of living

Within these categories groups are identified. A complete overview of the categories and groups is presented in Annex A.

2.1.2 Dimensions

The breakdown of the national accounts totals is done for three dimensions: income, consumption and wealth. The preferred income concept is the adjusted disposable income (ESA 1995, §8.33-8.35). This includes Social Transfers in Kind (STIK), which are the individual final consumption expenditures of the government and of the Nonprofit Institutions Serving Households (NPISH). These transfers consist for example of costs for education or healthcare. For the measurement of households’ welfare it should not matter whether these are government funded or private expenditures. Focusing on the adjusted disposable income improves international comparability of the welfare of households (Stiglitz, Sen, & Fitoussi, 2009, p.30-32). In the Netherlands, Social Transfers in Kind as a percentage of disposable income is high (10% in 2008) compared to other countries, see Figure 1 below.

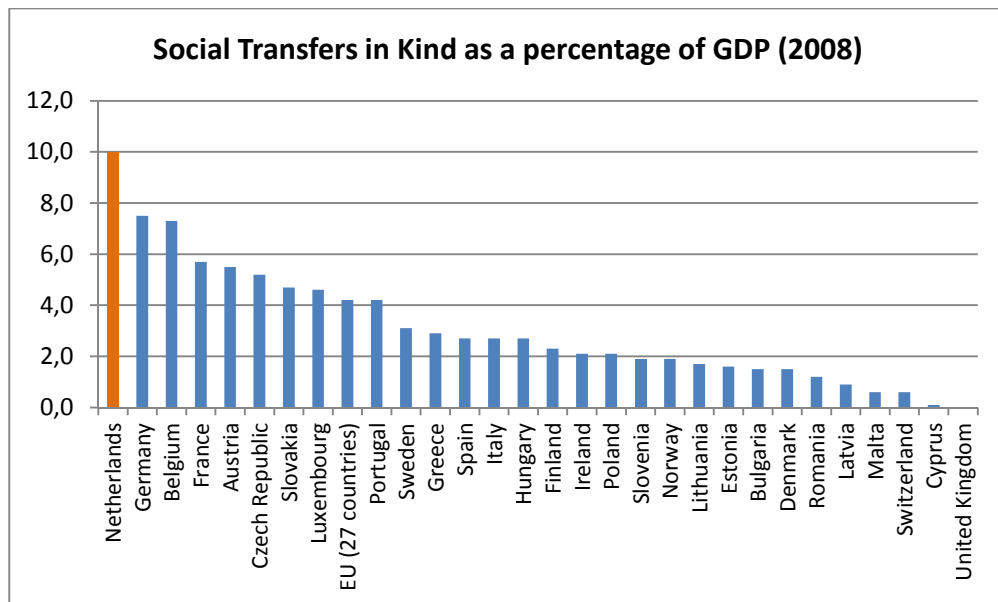


Figure 1: Social Transfers in Kind as a percentage of GDP (Source: Eurostat <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do?sessionId=9ea7d07e30d63de6371b99094ee5b58fc3754ccc99a4.e34MbxSahmMa40LbNiMbxMbNqMe0>)

For consumption, the actual individual consumption (ESA 1995, §3.82) is considered. This concept includes the final consumption expenditures of households plus again the Social Transfers in Kind. Because these STiK are taken into account both on the income side and the consumption side, there is no effect on savings.

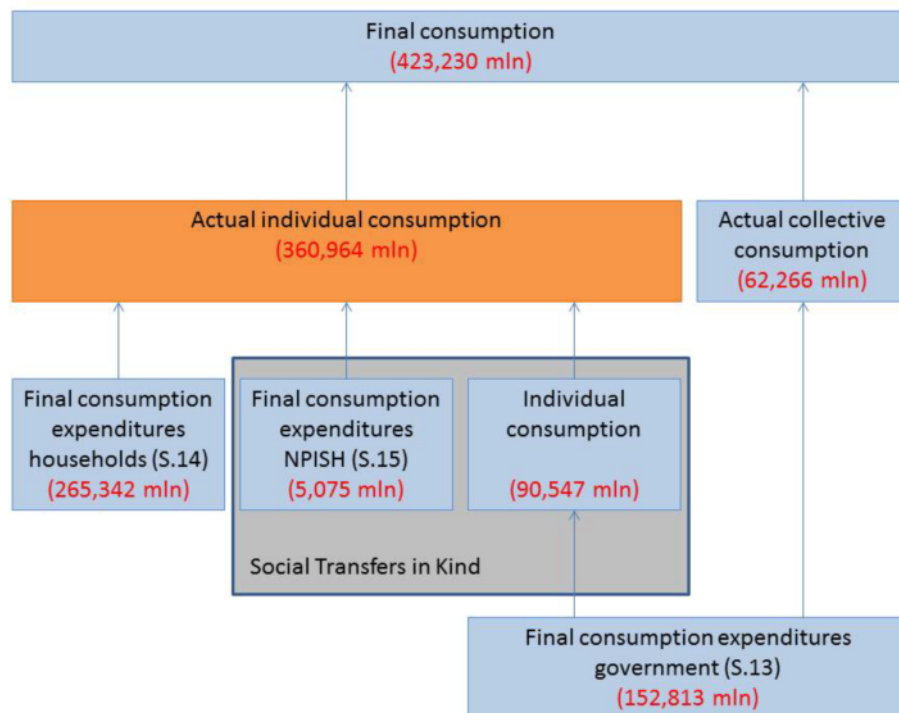


Figure 2: Consumption concepts, with 2008 data

The third and final dimension concerns wealth. This comprises financial wealth and non-financial wealth. Following ESA1995, financial wealth also includes the insurance technical reserves (ESA 1995, §7.58); these are not part of the wealth concept of the micro statistics. These reserves are not freely accessible and therefore households often do not consider this as their wealth. Non-financial wealth mainly consists of dwellings and land, but also company assets of the self-employed. In case the project deviates from the scope and definitions mentioned here, this is explicitly mentioned.

2.2 Data sources

2.2.1 National accounts

For income, consumption and for non-financial wealth, national accounts data is available for the households sector. For financial wealth, this is only available for the households sector including the Nonprofit Institutions Serving Households (NPISH). From 2012 onwards, also financial wealth should be distinguished between these two sectors. However, for 2008 this type of information has not yet become available. Research shows that (in 2009) the financial assets and liabilities owned by NPISHs were negligible compared to the financial assets and liabilities of households. Because these NPISHs contribute only a small amount, the data was not adjusted for their share.

The national accounts data do not offer any distributional information, and therefore this is gathered from micro sources, of which the Income Panel Survey (IPS) and the Household Budget Survey (HBS) are the most important. These two sources offer a considerable amount of information about the distribution of income, consumption and wealth. Additional sources that are used are the Pension Claims Statistics (PCS) and healthcare and education data. These last two data sources are used to estimate the Social Transfers in Kind for each household group.

2.2.2 Income Panel Survey

The Income Panel Survey (IPS) is an annual survey that consists of administrative records from multiple registers (including tax data). It includes income and wealth components (Claessen, 2010). This source covers approximately 200,000 individuals and 92,000 households for 2008.

The national accounts cover the whole of the resident population. Both the IPS and the HBS do not cover illegal immigrants and people living in overseas territories. For both sources, the estimated proportion of the population that falls outside the scope of the survey is less than 2%. Moreover the IPS covers the incomes at the end of the year, but the NA covers all the incomes earned in the year. The difference is

made by individuals that have emigrated or were deceased during the year. Because these proportions are rather small, no adjustments are made to the data.

2.2.3 Household Budget Survey

The Household Budget Survey (HBS) covers the consumption expenditures of households. It is an annual cross-sectional survey of around 3,600 individuals and 1,500 households¹. This survey excludes people living in non-private dwellings such as prisons and hospitals. From the IPS it is known how many non-private households are in each household group and the assumption is used that these non-private households have the same consumption pattern as comparable private households. On the basis of this assumption, the national accounts total does not need to be adjusted.

In the national accounts final consumption expenditures of households are categorized by type of goods and services following the Classification of Products by Activity (CPA). This includes the final consumption by non-resident households in the Netherlands. For these expenditures the total amount is available, but not distinguished by type of goods or services. To align the national accounts as closely as possible to the HBS, a correction to the national accounts data was made. Using the tourism accounts, it can be estimated how much non-resident households spend on the specific types of goods and services. The national accounts data by type of goods and services are lowered by this estimate.

2.2.4 Pension Claims Statistics

The information needed to distribute the assets in pensions funds (AF.612) over the households is gathered from the Pension Claims Statistics (PCS). These statistics calculate the pension benefits that individuals younger than 65 are entitled to when they retire. This claim does not equal the funds but the amount they are expected to receive at that date. For our purposes, the current claim needs to be recalculated to the Net Present Value². This is done by taking into account death rates and actuarial rules.

¹ The total number of individuals is around 20,000 and the total number of households is 8,400. Households participate in a sample for a maximum of 3 months and some for only 1 or 2 months. Therefore the effective number of households is lower.

² The PCS estimates the **expected** claims people have when they retire. For our purpose, the **current** claims are used; these are recalculated to current wealth.

Note that this source does not cover the claims of individuals older than 65 years. Therefore the national accounts transaction AF.612 is divided into two parts:

1. AF.612Y - for individuals younger than 65 years
2. AF.612O - for individuals 65 years and older

Macro controls are needed for both parts, but these are not provided by the national accounts for this split. To obtain these macro controls, the sum of the NPV of all pension claims is considered to equal the macro value for AF.612Y. The macro control for individuals older than 65 years equals the remainder between AF.612 and AF.612Y. The distributional information for AF.612Y is taken from the PCS, AF.612O is distributed following the pension benefits from the IPS.

The resulting distribution of these pension funds is best shown by the household classification of the age of the head of the household. For AF.612Y it shows that the pension wealth increases with age; the longer one has worked, the more pension wealth is accumulated.

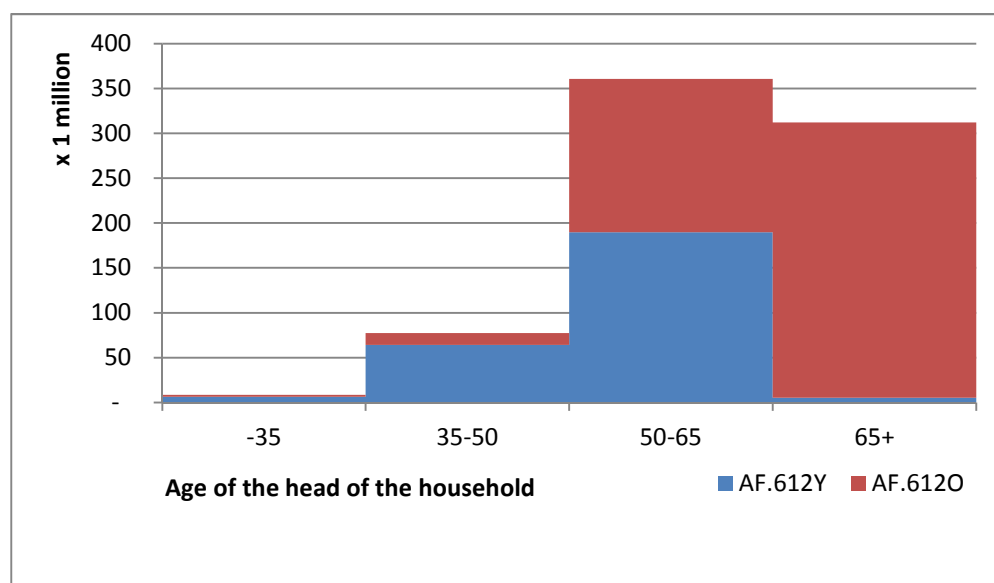


Figure 3: Distribution of AF.612 by age of the head of the household (2009)

2.2.5 Social Transfers in Kind

There is no survey that covers the distribution of the Social Transfers in Kind. For this purpose, two registers were constructed; one consisting of all individuals in the Netherlands and one of all households. Every person was allocated through a household code to one household. By means of estimates for the average expenditure on health care and education for a combination of age groups and gender, an average amount for each household can be estimated. The use of this tool is explained in greater detail in 2.3.

The data sources that provide the averages are the Education Statistics (ES) and the National Institute for Public Health and the Environment (RIVM, 2011). The ES gives government spending on education by type (primary, secondary or tertiary education)³, and the number of people enrolled in each type⁴. The RIVM gives the average costs for in kind healthcare for a combination of 21 age groups and gender.

2.2.6 Households

The number of households used in the NA is the average number of households in that year. This differs from the IPS, that takes the number at the end of the year. The distribution of the households over household groups is taken from the IPS and adjusted proportionally to match the NA numbers.

	2005	2006	2007	2008	2009	2010
Private households	7.091	7.146	7.191	7.242	7.313	7.386
Institutional households	213	209	207	207	207	209
Total number of households	7.304	7.355	7.397	7.449	7.520	7.595
Average number of households NA	7.329	7.376	7.423	7.484	7.557	

Table 1: Household population. Source: [StatLine households](#)

2.3 Distributional technique

To allocate the NA totals over the household groups, the distributional information from the micro sources was applied to the NA transactions. This was already done by the French Statistical Office (Accardo et al., 2009) and their work has laid the foundation for the harmonized approach of the OECD Expert Group (EG-DNA). Following Braakmann and Schwahn (2012), this approach will be called the *OECD basic approach*.

³ <http://statline.cbs.nl/StatWeb/publication/default.aspx?DM=SLNL&PA=80393NED&D1=2&D2=1-3&D3=a&VW=T>

⁴ Primary: <http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=37846SOL&D1=11-21&D2=0&D3=1-2&D4=14-18&HDR=G2,G1,G3&STB=T&VW=T>

Secondary: <http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=80041NED&D1=1&D2=0&D3=1-2&D4=1-10&D5=0&D6=4&HDR=G5,G4,G2,G1&STB=T,G3&VW=T>

Tertiary: <http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=70943NED&D1=0&D2=1-2&D3=0&D4=0&D5=1-2&D6=2-18&D7=17&HDR=G4,T,G2,G6,G1&STB=G3,G5&VW=T>

The distribution was done in two steps:

1. Link each NA transaction to distributional information from a micro source
2. Benchmark the distribution to the NA totals

Linking the NA to distributional information was done using three methods, presented in Figure 4.

1. Method A was used when the micro sources comprised distributional information for the NA transaction that was considered. In this case the distributional information was used to allocate the NA totals over household groups.
2. Method B was used when this direct link was not available, but when:
 - a. Distributional information was imputed on the micro level, or
 - b. A proxy was used.
3. Method C was used when method A or B were not feasible and no link with distributional information could be made. This method distributed the NA transactions over household with the notion that it did not involve the inequalities. The transactions were distributed in the same way as the sum of the transactions that could be distributed through method A or B.

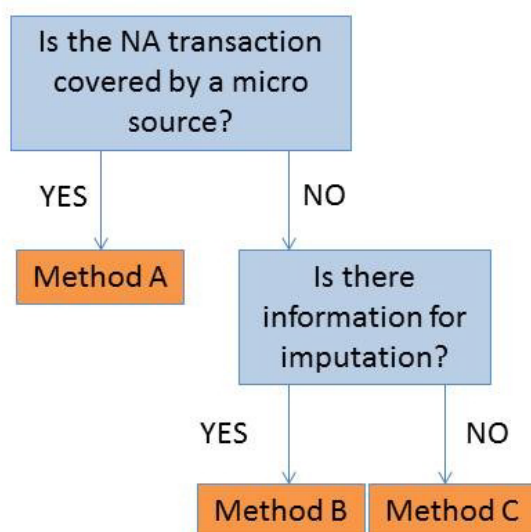


Figure 4: OECD basic approach

Method A is quite straightforward and easy to implement. If the national accounts transaction is covered by a variable in the micro source, the information can be used directly and benchmarked against the national accounts totals. This is separately done for all household categories. Box 1 shows an example of this benchmarking procedure. This method implies that any overestimation or underestimation of a component is proportionally distributed over the household groups. When the coverage rate (the sum of the micro variables as a percentage of the NA total) is

close to 100%, this implicit assumption seems valid. However, when there is a poor coverage, more prudence is called for when analysing the results.

Box 1: Benchmarking

This box gives an example of the benchmarking procedure. This is done for the NA transaction ‘wages and salaries’.

In the first row of the table below is the average amount per household group (in this case the standard of living) from the micro source.

The second row gives the number of households per household group. These are multiplied with the micro average in row 1 to give the micro total in row 3. The sum of all the aggregate micro values is in this case 241,193 million euros. The NA total for the transaction is 226,408 million euros.

The ratio between the national accounts total and the micro total over all household groups is the balancing coefficient. In the example below, the balancing coefficient is 0.94 (226,408 million euros / 241,193 million euros).

The micro total per household group (in row 1) is multiplied by this balancing coefficient to calculate the right levels for the distribution of the national accounts totals.

	Q1	Q2	Q3	Q4	Q5	Total
Average micro value (euros)	6,302	15,678	28,809	42,845	68,748	
Number of households (*1,000)	1,485	1,485	1,485	1,485	1,485	7,425
Micro total (million euros)	9,360	23,286	42,791	63,641	102,115	241,193
D.11	8,787	21,859	40,168	59,739	95,855	226,408

Table 2: Benchmark of ‘wages and salaries’ (2008 data)

This benchmarking procedure is the same for method B and C; the only difference is in the average micro value that is used in row 1. Method B either uses imputed information or a proxy to estimate this average. Method C uses the distribution of the sum of the transactions that are allocated by method A and B.

Method B either uses imputed distributional information, or a proxy. In both ways, the information is indirect, but the approaches are different.

- A proxy is used when a different variable is assumed to have a distribution that can be used for the NA transaction
- Imputation is used when there is only information available on the (semi) individual level

A proxy is used for the allocation of FISIM for example. There is no micro variable that covers this NA transaction. However, the distribution of interest from savings accounts and income from bonds is known and assumed to be similar to the distribution of received FISIM on interest. So the distribution of interest from savings accounts and income from bonds is used as a proxy for the allocation of FISIM over household groups.

Imputation is done for the Social Transfers in Kind, for these transfers no information is available on the household level. The best information there is are estimates on average expenses on an individual level, for example the education statistics showing participation rates, and the RIVM giving average costs for in kind healthcare. Using the *insurance value approach* (Verbist, Förster, & Vaalavuo, 2012) each individual is allocated an amount, based upon the available personal characteristics as gender or age.

In order to estimate these expenses for households, two registers were constructed. These registers are available in the social statistical database (SSB). This is a database in which multiple registers and surveys can be linked. These allow the formation of a coherent and consistent database for the necessary variables (Arts & Hoogteijling, 2002).

The first register consists of all individuals in the Netherlands identified by a personal identification number. For each individual, certain characteristics are available of which at least age and gender are important to link the distributional information. The household code is necessary to link the individual register to the household register. In the individual register each individual is allocated an amount for the transfers. The household register lists all the households in the Netherlands. For all households, characteristics are available that allow the creation of five household categories (mentioned in annex A). Each individual belongs to one unique household. Because the household register and the individual register are linked through the household code, the imputed averages can be determined on the household level as well. Box 2 explains this with a numerical example.

Box 2: Example estimating healthcare costs in kind

Using the two registers, the expenditures for households can be estimated based on information on a personal level. Consider, for example, a family of 4 persons:

- 35-year old female (head of the household)
- 40-year old male
- 10-year old female child
- 10-year old male child

In order to estimate the consumption *in kind* of the Healthcare Insurance Act, we assign to each of these individuals an average amount, based upon their age and gender. These average amounts are derived from the RIVM data source and added to the personal register.

Person/ number	Age	Gender	Household code	Healthcare
000838672	10	Male	120010250	1.342
100429721	40	Male	120010250	1.335
003145145	35	Female	120010250	1.869
000330215	10	Female	120010250	1.383
⋮	⋮	⋮	⋮	⋮

Each individual of this family has the same household code. By aggregating over this household code, the average amount for the whole family is calculated (5,929 euros). This amount is linked to the household register using the unique household code.

Household number	Household code	Age of the head of the household	Number of household members	Healthcare
0025201	120010250	35	4	5,929
⋮	⋮	⋮	⋮	⋮

This household register consists of the household characteristics, for example the age of the head of the household as illustrated in the example above, but also all the characteristics needed to form the four other household categories.

This approach is used for most transactions that form the Social Transfers in Kind. It is important that for every transaction a national accounts total and distributional information that covers the same transaction are available. At the moment this register is filled by adding averages for the combination of age and gender. The more detailed the features are that are used for this imputation, the more accurate the results will be.

From 2009 onwards register data is available for the Healthcare Insurance Act. Ideally this can be linked through the personal identification number in the register. Currently the possibility to switch from the insurance value approach to the actual value approach using this register data for healthcare costs is examined.

Lastly, method C is used when there is no direct or indirect information for distribution is available. This method uses the distribution of the transactions that are allocated through method A and B. This implies that the distributions of these transactions do not influence the inequalities between household groups.

3. Results

The breakdown of adjusted disposable income, actual consumption and wealth is made for five household categories: housing status, household composition, age of the head of the household, the main source of income and the standard of living. The results section focuses on the standard of living. The standard of living ranks the households based on their equivalized micro cash disposable income from the poorest to the richest households. This ranking is divided into five equal groups, the poorest households are in the lowest quintile (Q1), and the richest households are in the highest quintile (Q5).

3.1 Equivalence scales

The results are presented per consumption unit. These consumption units are obtained by using equivalence scales. These standardize income, consumption and wealth by taking into account the economies of scale within the household and recalculating each household to a household of one person. There are several equivalence scales, and the choice for an equivalence scale can influence the results on inequality (Siermann, Van Teeffelen, & Urlings, 2004). In this paper the Oxford Modified Equivalence Scale is used, because it was the most commonly used and therefore preferred scale in the EGDNA. This scale assigns the values 1 to the head of the household, 0.5 to every other household member aged 14 years or over and

0.3 to every other household member younger than 14 years⁵. Each quintile represents the same number of households, but not the same number of consumption units.

The distribution is made for five years, 2005-2009. For these years annual data sources are available. The next subsection discusses the distributions. In section 3.2 the focus is on the measures of inequalities that can be derived from these distributions.

3.2 Distributions

The resulting income distribution for 2009 is presented in figure 5. For each 20% of the households the income transactions are given. The richest households receive relatively much property income and have a higher operating surplus / mixed income. They also pay more taxes, which is a direct result of their higher income.

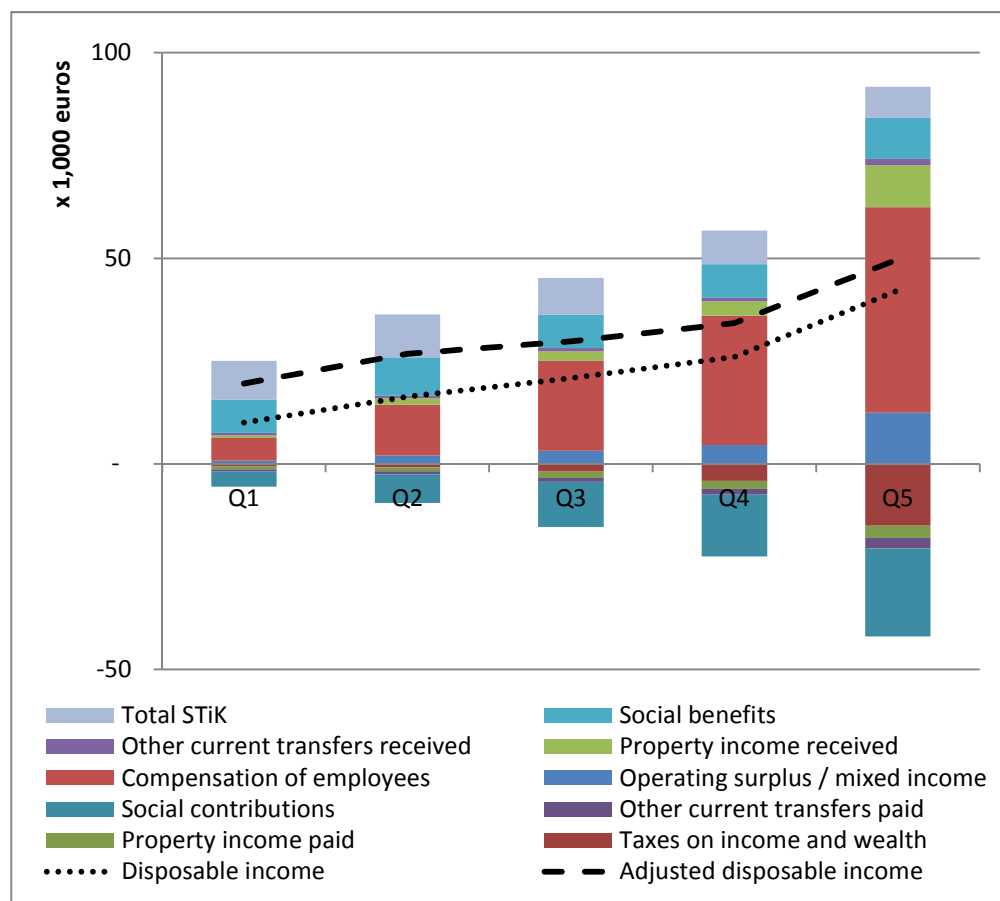


Figure 5: Equivalized adjusted disposable income by transaction (2009)

⁵ For example: a family of three people (head of the household aged 30, other members aged 30 and 10) has a disposable income of 40,000 euros. Their equivalized disposable income is 22,222 euros (40,000 / 1.8).

Figure 6 shows the distribution of the equivalized social benefits and social contributions. It shows that the 20% poorest household do not receive the most benefits, in fact, per consumption unit they receive the least. The redistributive effects of the social schemes are not caused by the social benefits, but by the contributions. These increase substantially with household income.

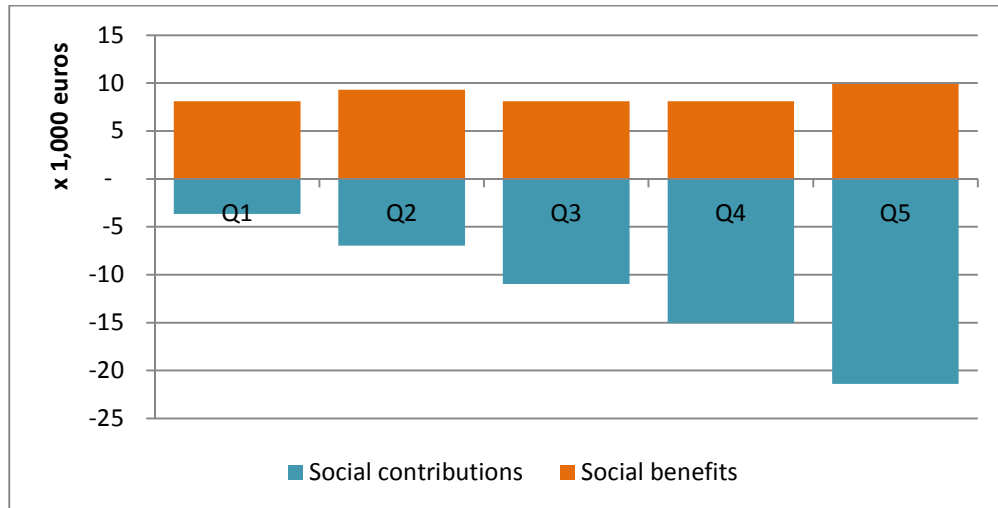


Figure 6: Equivalized social benefits and contributions (2009)

Figure 7 shows the Gross Disposable Income (GDI) in four stages, allowing for a further look at the redistributions. The first stage is the GDI before taxes and social contributions are paid, and before social benefits are received. It shows that for this income concept 47% is owned by the 20% richest households, and just 3% by the 20% poorest households. For Q1 until Q4 their share in total income increases when taxes are considered, because they pay relatively less than the other households. Taking into account the social contributions and benefits improves the picture for the two lowest quintiles, and including the social transfers in kind does the same for the lowest three quintiles. The share of Q3 is relatively stable for all income concepts considered. The share of the richest households decreases from 47% before taxes, and social contributions and benefits, to 33% when all redistributive transactions are considered, including the STiK.

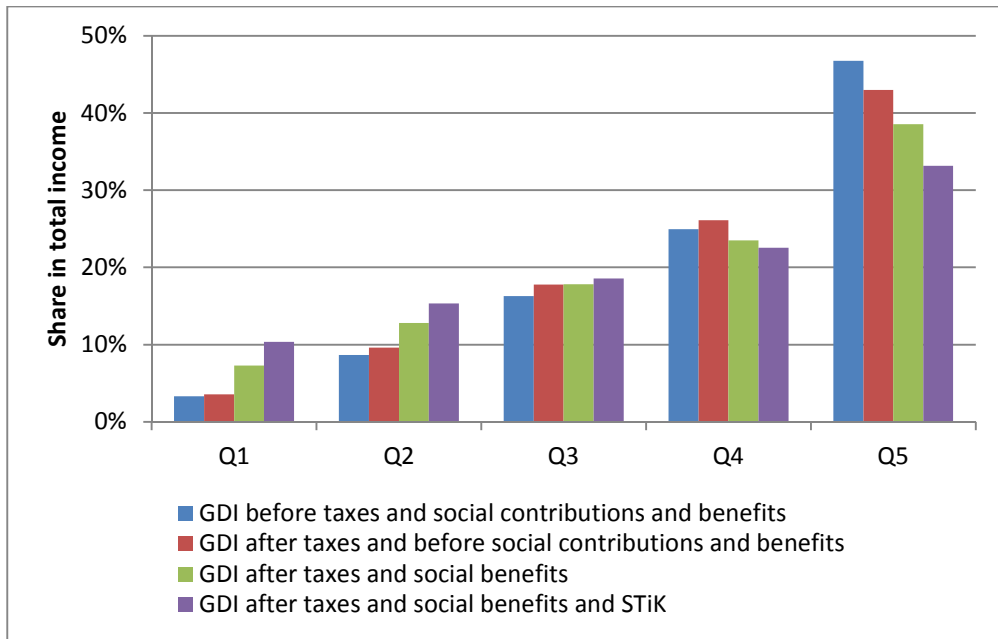


Figure 7: Effects of redistributive transactions (2009)

The distribution of the actual final consumption expenditures per consumption unit is given in figure 8. The Social Transfers in Kind equal the amount on the income side. It shows that inequality on the COICOP level is highest for transportation (the purchase, use, and maintenance of transportation vehicles) and recreation and culture.

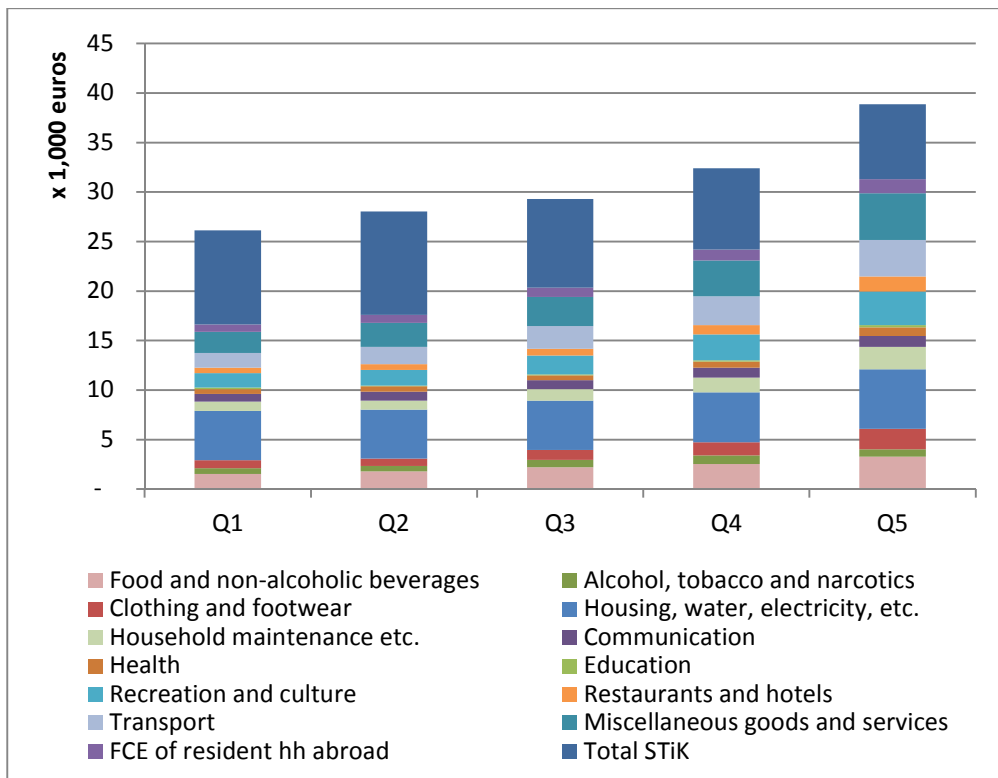


Figure 8: Equalized actual final consumption (2009)

The individual savings result from the distribution of the disposable income and the final consumption. These savings are not influenced by the Social Transfers in Kind, because these are taken into account both on the income and the consumption side. The collective savings are the adjustment for the change in net equity of households in pension funds reserves (ESA 1995, §4.141-4.142). This adjustment is made because pension contributions and benefits are recorded as current income components, but also as saving and dissaving. The adjustment makes sure that the changes in pension entitlements are recorded in the savings of households as well. For every quintile this adjustment is positive, but for the first two quintiles it is very small. For the households with the highest incomes, this adjustment is considerably larger. Together, individual and collective savings equal total savings. These are negative for the two lowest quintiles. In figure 9 the savings are presented by the savings rate, which shows total savings as a percentage of the disposable income. The poorest households have a savings rate of -65%.

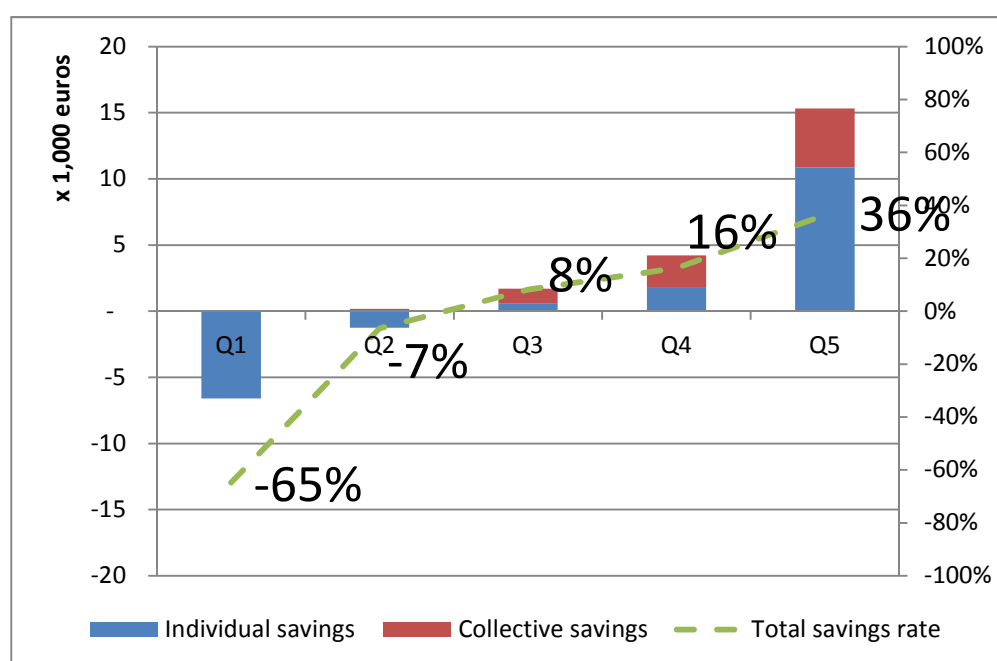


Figure 9: Equalized savings on the left axis and the savings rate on the right axis (2009)

The savings rates for the years 2005-2009 show the same pattern for all years. It can be argued that such a savings rate cannot be maintained for a long period of time. First of all, it should be noted that this is an average for the quintile, meaning that not all households in these quintiles necessarily have negative savings. Second this approach is not designed to track specific households over time, because households are not necessarily in the same quintile every year. For example Q1 consists for a part of the self-employed with negative earnings in a year. This can be due to investments made, or just a bad year, but the next year they might be in a different quintile. Third, the first quintile includes all the young households and a relatively

large number of old households. For all the cohorts until the age (of the head of the household) of 27, (far) more than 20% is part of the first quintile. This is also the case for the age cohorts of the 80s and 90s. The socio-economic status of these households confirms that this group contains a large number of students. Of the 280 thousand households of which the head has the socio-economic status of a student, 86% is allocated to Q1. This equals 15% of the population of Q1. Students often receive additional payments from their parents, which are inter-household transfers which are not fully accounted for in national accounts. Moreover, students often are more willing to borrow money, because they have a prospect of earning higher incomes in later years, and they are not expected to remain in this quintile for many consecutive years. The old households in this quintile might depend more on their savings built up in earlier years, or also on intrahousehold transfers from their children. Another possibility is that the HBS has a survey problem. A poor household might overestimate its consumption pattern or there might be an underrepresentation of the poorest households.

There is, however, also a vulnerable group within this quintile. This includes households on welfare, or the unemployed. These are less likely to leave this group than students. Their disposable income is too low to cover their consumption. Being exposed to a savings rate of this kind cannot be maintained for longer periods. The characteristics of the households in the first quintile indicate that the results are not as bad as they look at first glance. However, before any firm conclusions can be drawn, further research is needed, for example by following the households in Q1 over a longer period of time.

Wealth in the NA comprises financial wealth and non-financial wealth. Financial wealth is the result of assets and liabilities. Figure 10 presents the equivalized values for total wealth by financial transaction for 2009. A large amount of wealth is locked up in insurance technical reserves (pension funds). Households do not often consider this to be their wealth, because it is not freely accessible. Equivalized wealth without the insurance technical reserves is still around 50 thousand euros for the lowest quintile. The households with the highest income own more than 300 thousand euros, and with the insurance technical reserves included almost 475 thousand euros.

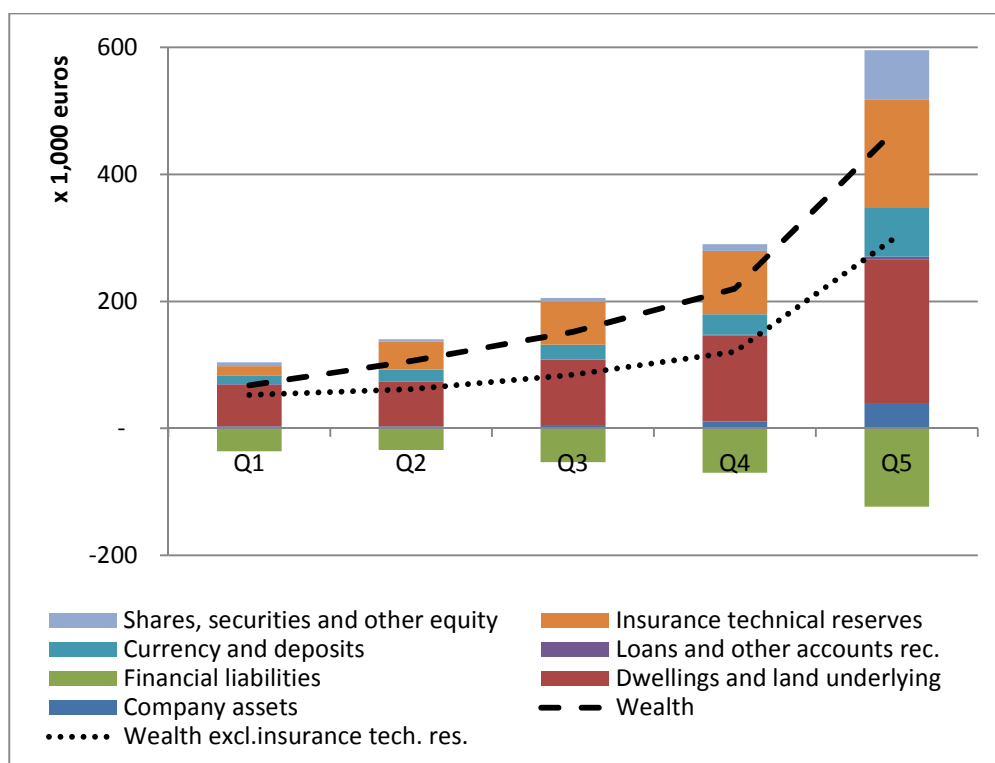


Figure 10: Equivalized wealth by transaction (2009)

Financial liabilities mainly comprise the mortgages on dwellings. For each quintile the value of the dwellings and land underlying dwellings is more than the value of the mortgages. Company assets are only held by self-employed. This includes software, inventories, machinery, computers, etc. The coverage of these company assets by the micro sources is very low (annex C) and should be interpreted with care.

3.3 Measures of inequality

These distributions give interesting insights in the differences between groups on a detailed level. They also allow us to create measures of inequality. This subsection focuses on three indicators, that were also used in the Expert Group on measuring Disparities in a national accounts framework (Fesseau & Mattonetti, 2013).

3.3.1 Ratio highest to the lowest

A common measure of inequality is the Q5/Q1 ratio of the income, which measures the difference between the two extreme values in the distribution. In Table 3 this ratio can be compared over time and between dimensions. A value of 1.0 would mean that there is no inequality and every consumption unit earns, consumes or possesses just as much as any other consumption unit. This table shows that in every

year inequality is highest for the wealth dimension, followed by the adjusted disposable income.

Standard of living	2005	2006	2007	2008	2009
Adjusted disposable income	2,9	2,8	2,8	2,7	2,5
Actual consumption	1,6	1,7	1,6	1,6	1,5
Wealth	7,4	7,4	7,8	7,0	7,0

Table 3: Q5/Q1 ratio for the standard of living per consumption unit

The results show that inequality in every dimension is lower in 2009 than it was in 2005. The Q5/Q1 ratio for actual consumption is relatively stable. Inequality in wealth was lower in 2008 en 2009 than it was in the years before. Wealth for the poorest households increased every year, while the richest household saw their wealth decrease because of the financial crisis on the stock markets. This is reflected in the National Accounts totals for the pension funds (insurance technical reserves), the shares, and dwellings and land underlying dwellings.

3.3.2 Ratio to the average

A second measure of inequality is the ratio to the average, taking the average amount of the household group as a ratio to the average amount of the total population. A value of 1.0 means that the average of the household group is equal to the average of the total population. For all three dimensions we see that the two extreme values (Q1 and Q5) are closer to the average in 2009 than they were in 2005). This is in line with the results of the previous indicator. Also for all three dimensions the three lowest quintiles are below average and the two richest quintiles are above. Q4 is always closest to the average.

	2005	2006	2007	2008	2009
Q1	0,56	0,58	0,58	0,58	0,60
Q2	0,77	0,79	0,79	0,80	0,82
Q3	0,88	0,88	0,88	0,88	0,91
Q4	1,04	1,03	1,02	1,02	1,04
Q5	1,63	1,61	1,61	1,59	1,52

Table 4: Ratio to the average for adjusted disposable income

For Q1 and Q2 the improvements compared to the average are gradual, as was the decline for Q5. For Q3 the improvement was due to the developments in the last year.

	2005	2006	2007	2008	2009
Q1	0,81	0,78	0,80	0,80	0,84
Q2	0,84	0,85	0,86	0,88	0,90
Q3	0,93	0,93	0,93	0,92	0,94
Q4	1,03	1,05	1,03	1,05	1,04
Q5	1,33	1,32	1,32	1,28	1,24

Table 5: Ratio to the average for actual consumption

The spread around the average is much smaller for actual consumption than it is for adjusted disposable income, this was also reflected in the previous indicator. For actual consumption we see that 4 of the 5 groups are closer to the average in 2009 than they were in 2005. Only Q4 moved away from the average, albeit a little. The movements in wealth are smaller than for the two dimensions above. The households with the lowest incomes improved their position against the average, but for Q5 this worsened.

	2005	2006	2007	2008	2009
Q1	0,31	0,30	0,29	0,32	0,32
Q2	0,48	0,50	0,49	0,50	0,50
Q3	0,71	0,72	0,69	0,72	0,71
Q4	1,01	1,02	1,00	1,00	1,03
Q5	2,28	2,24	2,29	2,22	2,21

Table 6: Ratio to the average for wealth

This ratio is difficult to interpret, as there can be opposite movements of the groups. It is difficult to make a statement about inequality for the dimension based upon this ratio. For every dimension it is the fourth quintiel that is closest to the average.

3.3.3 Disparity index

Following the approach of the EG-DNA also for the Dutch project the disparity index is calculated. The disparity index shows the dispersion from the average across all household groups. It is calculated as the ratio of the standard deviation to the mean (Fesseau & Mattonetti, 2013):

$$CV_z = \frac{\sqrt{\frac{1}{N} \times \sum_{i \in z} [n_i \times (\bar{X}_i^{NA_{adj}} - \bar{X}^{NA_{adj}})^2]}}{\bar{X}^{NA_{adj}}} * 100 \quad (1)$$

Where:

- z = household category
- i = household group
- n_i = total number of households in group i
- N = total number of households in the population
- $\bar{X}_i^{NA_{adj}}$ = average adjusted disposable income for household group i
- $\bar{X}^{NA_{adj}}$ = average adjusted disposable income for the total population

Table 7 shows the results for the disparity indicator. An increasing index means that the dispersion over the household groups increased, indicating that inequality grew. According to this measure, inequality in all three dimensions decreased, the biggest change occurred in 2009 for income and consumption. For wealth the biggest change was in 2008, for the reasons mentioned above (see figure 11).

Standard of living	2005	2006	2007	2008	2009
Adjusted disposable income	37	35	35	34	31
Actual consumption	19	19	18	17	14
Wealth	71	70	72	69	68

Table 7: Disparities indicator for the standard of living

4. Conclusions

A greater prominence on households and distributions within the households sector allows for better understanding of household welfare (Stiglitz, Sen, & Fitoussi, 2009). Adding distributional information to the existing national accounts framework gives important new insight into the welfare of households.

Indicators of inequality in itself are not new, on the micro level these already exist. A comparison with these indicators is difficult as there are many differences in methodology, choice of household categories and groups. The added value of the work presented in this paper is the creation of a complete, comprehensive and consistent overview of inequalities within the National Accounts households sector. The benchmarking to the NA totals ensures the coverage of the entire population. The inclusion of Social Transfers in Kind allows for better comparability over countries, and also over time in case expenditures shift from the public to the private sphere or vice versa. The addition of the broad measure of wealth (including insurance technical reserves) to the available stock of information completes the picture of the households sector.

The results presented here also show that great care must be addressed when considering the savings rate. For all years considered the savings rate is very negative for the poorest households. Some remarks were mentioned in this paper about the population in this quintile, however no firm conclusions can be drawn because these are merely suppositions. The results for Social Transfers in Kind are estimated through an insurance value approach, assigning average values to individuals based upon age and gender specific cohorts. These estimates can be improved when more information becomes available. In the near future registers with healthcare data become available, that possibly allow the switch to the actual value approach. These healthcare expenditures form about one-third of the total STiK.

When 2009 is compared to 2005, inequality in all dimensions decreased according to the ratio high / low and the disparities indicator. The ratio to the average does not give one result, but a result for each group, so this is less easy to interpret. Showing three measures of inequality for three dimensions (and five household categories) makes it difficult to make one true statement about inequality when opposite signs occur, however the results for the standard of living show mainly decreasing inequality.

	Ratio High / Low	Disparities indicator
Adjusted disposable income	↓	↓
Actual consumption	↓	↓
Wealth	↓	↓

Table 8: Direction of the change in inequality (2005-2009)

Building upon the work within the Expert Group, the results of this project shows that it is possible to produce these indicators for a series of years. The aim of the Expert Group to harmonize the approaches could result in a valuable dataset that allows us to judge inequalities in an international context. This will add significant strength to the debate on inequalities.

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6. Annex A – household categories

Household category	Household group
Housing status	Owners
	Renters with subsidies
	Renters without subsidies
Household composition	Single males
	Single females
	Single parent families
	Couples with children

	Couples without children
	Other households
Main source of income	Wages and salaries
	Income from self-employment
	Transfers because of old age
	Other transfers
Age of the head of the household	Younger than 35 years old
	35 – 50 years old
	50 – 65 years old
	65 years and older
Standard of living	1 st quintile (20% households with the lowest disposable income)
	2 nd quintile
	3 rd quintile
	4 th quintile
	5 th quintile (20% households with the highest disposable income)

7. Annex B – definitions

Households sector

The households sector “*covers individuals or groups of individuals as consumers and possibly also as entrepreneurs producing market goods and non-financial and financial services*“ (ESA 1995, §2.75).

Household

A household is defined as a “*group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food*” (SNA 2008, §4.149).

Head of the household

The SNA does not define the head of the household this strictly. The definitions that are used to identify a *household* and the *head of the household* are in line with the micro statistics. These definitions reflect the perception of these terms by individuals. The head of the household is determined with the help of a decision tree based upon the personal income and the source of income.

1. First, for a single-parent household it is always the parent who is the head of the household.
2. Second, for couples it is one of the partners who is the head of the household. There is a priority rule regarding the source of income.
 - a. If one of the partners is self-employed, he or she is the head of the household, even if the income from this source is negative.
 - b. After this priority rule, the partner with the highest personal income is the head of the household.
3. Third, for other households, the person with the highest income from self-employment is the head of the household.
4. Fourth, the person with the highest personal income is the head of the household.

Consumption Unit

Consumption units are calculated using a weighting scale. This scale assigns a value to each member of the household, calculating the number of consumption units. The number of individuals in a household is less interesting than the number of consumption unit, as larger households have economies of scale in their consumption.

The weighting scale used in this paper is the Oxford Modified Equivalence Scale, which assigns a value of 1 to the household head, of 0.5 to each additional adult member (14 years and older) and of 0.3 to each child younger than 14 years.

Explanation of symbols

.	Data not available
*	Provisional figure
**	Revised provisional figure (but not definite)
x	Publication prohibited (confidential figure)
–	Nil
–	(Between two figures) inclusive
0 (0.0)	Less than half of unit concerned
empty cell	Not applicable
2013–2014	2013 to 2014 inclusive
2013/2014	Average for 2013 to 2014 inclusive
2013/'14	Crop year, financial year, school year, etc., beginning in 2013 and ending in 2014
2011/'12–2013/'14	Crop year, financial year, etc., 2011/'12 to 2013/'14 inclusive

Due to rounding, some totals may not correspond to the sum of the separate figures.

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8. Annex C – methods

This annex shows the methods used per NA transaction. In case the NA transaction is covered by the micro sources (method A), the coverage rate is mentioned as well.

The coverage rate is calculated as follows:

$$CR_x = \left(\frac{Micro_x}{NA_x} \right) * 100 \quad (2)$$

Where:

x denotes the NA transaction,

$Micro_x$ the sum of the micro variables linked to the NA transaction, and

NA_x the NA total for the transaction.

8.1 Income components

Transaction	NA amount (2009)	Method	Coverage rate
Operating surplus from owner occupied dwelling	15.137	A	69%
Operating surplus from leasing of dwelling	410	A	201%
Mixed income from self-employment	18.609	A	136%
Mixed income from own-account production	12.578	B proxy	
Mixed income from underground production	9.455	B proxy	
Uses			
Interest paid	36.373	A	91%
Financial intermediation services indirectly measured (FISIM)	-17.329	B proxy	
Withdrawals from income of quasi-corporations	579	B proxy	
Rents	219	B proxy	
Taxes on income	49.246	A	88%
Other current taxes	6.197	B proxy	
Actual social contributions (social security)	78.695	A	113%
... for exceptional medical expenses (AWBZ)	13.650	A	114%
... for healthcare (ZVW)	29.260	A	110%
... for disability	11.366	A	112%
... for old age	18.971	A	113%
... for unemployment	5.448	A	123%
Actual social contributions (pensions)	50.897		
... actual paid contributions	32.998	A	93%
... counterpart of property income attributed to insurance policy holders	17.899	B proxy	
Miscellaneous current transfers (excl. transfers between households)	10.903	C	
Miscellaneous current transfers between	4.139	A	17%

households			
Means			
Wages and salaries	229.450	A	107%
Employers' actual social contributions	54.066	A	98%
Employers' imputed social contributions	10.162	B proxy	
Interest received	9.931	A	89%
Financial intermediation services indirectly measured (FISIM)	415	B proxy	
Dividends	9.317	A	53%
Withdrawals from income of quasi-corporations	1.108	B proxy	
Property income attributed to insurance policy holders	23.940	B proxy	
Rents	4	A	4992%
Social security benefits in cash	42.558	A	95%
... for disability	8.474	A	94%
... for old age	27.812	A	101%
... for unemployment	6.272	A	67%
Private funded social benefits	30.466	A	119%
Social assistance benefits in cash	17.560	A	91%
... for welfare	4.044	A	91%
... for additional healthcare	3.570	A	97%
... for child allowance	4.343	A	96%
... other	5.603	A	85%
Miscellaneous current transfers (excl. transfers between households)	6.404	C	
Miscellaneous current transfers between households	4.139	A	15%

8.2 Consumption components

The NA totals for the consumption components are after corrections made for the final consumption expenditures of foreign household on the Dutch territory.

Transaction	NA amount (2009)	Method	Coverage rate
Food and non-alcoholic beverages	26.644	A	91%
Alcohol, tobacco and narcotics	8.129	A	58%
Clothing and footwear	14.074	A	92%
Housing, water, electricity, etc.	60.174	A	115%
Household maintenance etc.	16.061	A	96%
Health	7.112	A	46%
Transport	28.607	A	97%
Communication	10.888	A	68%
Recreation and culture	25.940	A	104%
Education	1.548	A	134%

Restaurants and hotels	10.181	A	144%
Miscellaneous goods and services	37.462	A	97%
FCE of resident households abroad	11.652	C	

8.3 Social transfers in kind

The social transfers in kind are entirely estimated by imputation. Current developments focus on the use of register data for a large part of the health related costs.

Transaction	NA amount (2009)	Method	Coverage rate
Social transfers in kind	102.381	B imputed	

8.4 Wealth components

Transaction	NA amount (2009)	Method	Coverage rate
Financial assets			
Currency and deposits receivable	394.623	A	74%
Shares, securities and other equity	259.081	A	103%
Loans receivable	3.475	B proxy	
Net equity of households in life insurance reserves	183.625	B proxy	
Net equity of households in pension funds reserves	758.766	A / B proxy	
Prepayments of insurance premiums and reserves for outstanding claims	21.094	B proxy	
Other accounts receivable	12.613	B proxy	
Financial liabilities			
Financial derivatives	15	B proxy	
Short-term loans	24.233	B proxy	
Mortgages	639.619	A	100%
Long-term consumer credit	9.447	B proxy	
Long-term student loans	15.375	A	12%
Other long-term loans	44.582	B proxy	
Other accounts payable	25.553	B proxy	
Non-financial assets			
Company assets	168.303	A	17%
Dwellings and land underlying dwellings	1.419.701	A	94%

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