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Explanation of symbols

.	= data not available
*	= provisional figure
**	= revised provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2008–2009	= 2008 to 2009 inclusive
2008/2009	= average of 2008 up to and including 2009
2008/'09	= crop year, financial year, school year etc. beginning in 2008 and ending in 2009
2006/'07–2008/'09	= crop year, financial year, etc. 2006/'07 to 2008/'09 inclusive

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

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Puck Taminiau-van Veen[1]

Abstract

In order to complete the national accounts, Statistics Netherlands is in the process of developing complete balance sheets for the non-financial assets. This paper presents the methods and results of compiling balance sheets of consumer durables. Consumer durables are a memorandum item in the non-financial balance sheets. The Perpetual Inventory Method is used to convert the time series of consumption into wealth stocks. In 2008, the average household owned for 22.000 euro worth of consumer durables.

Keywords: consumer durables, non-financial assets, balance sheets, Perpetual Inventory Method

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1. Introduction

Statistics Netherlands recently developed non-financial balance sheets for the Netherlands with the purpose of releasing these balance sheets on an annual basis as a regular part of the Dutch national accounts. Consumer durables are included in the non-financial balance sheets as a memorandum item. According to ESA '95 consumer durables are durable goods used by households repeatedly over periods of time of more than one year for final consumption. This paper discusses the measurement of consumer durables in the Dutch national accounts.

Consumer durables are estimated using the Perpetual Inventory Method (PIM). Inputs needed for the PIM include time series of households' final consumption expenditure of consumer durables and expected service lives.

Section 2 describes the measurement issues concerning the estimation of consumer durables. In section 3 the results are presented, followed by conclusions in section 4.

2. Measuring consumer durables

The value of consumer durables at any particular point in time, like any other fixed asset, can be estimated with the Perpetual Inventory Method (PIM). The PIM is a model in which the gross (new or replacement) value and the net (market) value of durable goods are calculated on the basis of a time series of purchases. The first step is to calculate the gross value of a group of consumer durables of a certain age on the basis of estimated discard functions and time series of consumption of new consumer durables. After that, the productive capacity of the group of consumer durables is determined by applying an age efficiency profile to the replacement value. Next, the net value of the durables is calculated as the net present value of expected present and future services delivered by these durables. A typical service of clothes is the process of being worn or of a car or bicycle the process of being driven. Aggregating over all age groups results in the total net value of a particular consumer durable item.

This method is similar to the method used to calculate capital stocks of fixed assets in the Dutch national accounts. A detailed description of this method is given in Van den Bergen et al (2009)[2]. Obviously, one important difference is that consumer

[2] Bergen, D. van den, M. de Haan, R. de Heij and M. van Rooijen-Horsten (2009), '*Measuring Capital in the Netherlands'*, paper prepared for the OECD Working party on National Accounts,11-14 October 2005, Statistics Netherlands, The Hague-Heerlen, discussion paper nr. 09036.

durable stocks are derived from consumption expenditure instead of investment time series.

To calculate the stock of consumer durables, the following inputs are needed:

- Time series of final consumption expenditure of new consumer durables
- Survival functions
- Age efficiency profiles
- Discount rate
- Time series of other changes in volume of assets and purchases of second hand assets.

2.1 Time series of final consumption expenditure of consumer durables

Final consumption expenditure of consumer durables in the Dutch national accounts is divided into the following goods:

- Textile and clothing *(e.g. sweaters, trousers, towels)*
- Leather goods and footwear *(shoes, leather coats)*
- Home furnishing *(cupboards, beds)*
- Household appliances *(refrigerators, washing machines, iPods)*
- Household articles *(pots and pans, tools)*
- Vehicles *(cars, bikes)*
- Other durable consumer goods *(toys, computers)*

Time series from 1953[3] onwards are directly available from the national accounts. Starting point of the estimates represents the stock of consumer durables at 1952 which is based on 1953 final consumption expenditure data and the estimated service lives for the consumer durables.

2.2 Survival functions

The survival functions of consumer durables are based on service life estimations. Various sources were used to determine these service lives including information from consumers' organizations, service lives from the US Bureau of Economic Analysis, producers of consumer goods and literature.

Concerning the service lives of household appliances, a distinction is made between audio/video equipment and other household appliances. For audio/video equipment service lives are expected to decrease in time since in the old days for example radios and telephones seemed to have much longer service lives than the ipods and mobile phones of today.

[3] The time series covering the period 1953-1968 is available in constant prices (of 1969) only.

Table 1 sums up the estimated service lives for the various types of consumer durables.

Table 1: Estimated service lives for consumer durables in years

Textile and clothing	3
Leather goods and footwear	3
Home furnishing	10
Audio/video equipment	Decreasing from 8 to 6 years
Other household appliances	9
Household articles	10
Vehicles	8
Other consumer durables	5

2.3 Age efficiency profiles

Most assets are assumed to be subject to declining performance as a result of aging. For example, it is likely that older cars need repairs more often than newer cars. However, the classic example of a light bulb is the exception: it just works or doesn't. The efficiency performance is reflected by the age efficiency profile.

The steepness of age efficiency profiles is predetermined by a parameter β which is given a value between 0 and 1. A value of 1 indicates a constant level performance similar to light bulbs. Almost all consumer durables are assumed to have a declining performance, although in some cases the reason for the decline in performance is different from that in regular capital goods. Decline in performance by capital goods can (in theory) be measured objectively, for example when machines can not be used as often as before because of defects. The decline in performance of consumer durables may be more subjective in nature. For example, when clothes are out of fashion, people will have less intention to wear them than new clothes. Also, when a mattress dates, one will enjoy it less to sleep on it than on a new mattress, which is reflected in a lower price for the mattress if sold on the second-hand market. We selected a β of 0,75 for all types of consumer durables, which corresponds with a declining performance level.

2.4 Discount rate

The real discount rate needed to determine the net present value of current and future services of consumer durable is set at 4 percent. This rate corresponds to that used in the regular PIM model for fixed assets at Statistics Netherlands.

2.5 Time series of other changes in volume of assets and purchases of second hand assets

When a new year is added to the time series of final consumption expenditure, only purchases of new consumer durables are taken into account. Sales and purchases of second hand consumer durables are recorded under the entry other changes in assets, since these durables are aged and less efficient compared to new consumer durables.

However, purchases and sales of second hand consumer durables between consumers are not taken into account, since sales and purchases cancel each other out. Only trade margins (by companies) and VAT on the purchase of second hand consumer durables add to the stock of consumer durables. In practice, only the trade margins and VAT on the purchase of second hand cars are taken into account. Furthermore, the purchase by households of second hand lease cars, which is the reciprocal of the sales of second hand lease cars by the industry renting of movables, is also included in the other changes in assets.

3. Overview of results

With all input as described in section 2 of this paper, the PIM is run to determine the balance sheets of consumer durables[4]. It is important to underline that this balance sheet does not provide a complete picture of household wealth. For example, owner occupied dwellings are excluded since the purchase of dwellings is in the national accounts recorded as gross fixed capital formation (leading subsequently to the production of own account housing services) and not as consumption. Similarly, all other household purchases of durable goods for production purposes are excluded from this table.

A complete balance sheet for 2008 is presented in table 2.[5] The value of consumer durables increased with more than 3 billion euros in 2008. This is mainly due to the other changes in assets: purchases of second hand lease cars and trade margins and VAT on the purchase of second hand cars. The value of home furnishing increased with more than 1 billion euros, caused by price effects. The value of vehicles on the other hand decreased in 2008. This is a price effect: the purchase of new and second hand vehicles was with 10.2 million euro higher than the depreciation.

Home furnishing and vehicles represent the largest value of consumer durables, with each about 25% value shares. Leather goods and footwear has a relatively small value share.

[4] Only the net values of consumer durables are presented in this section

[5] The consumption together with other changes in assets in table 2 equals the consumption of consumer durables in the national accounts.

Table 2: Complete balance sheet of consumer durables for 2008* in current prices

	Opening balance sheet	Revaluation	Consumption	Depreciation	Other changes in assets	Closing balance sheet
	billion €					
Textile and clothing	16.9	-0.1	11.7	-11.3	0.0	17.2
Leather goods and footwear	3.9	0.1	2.6	-2.6	0.0	3.9
Home furnishing	38.0	1.2	7.8	-7.9	0.0	39.1
Household appliances	21.0	-1.0	6.8	-5.0	0.0	21.8
Household articles	12.7	0.3	2.7	-2.6	0.0	13.0
Vehicles	37.7	-0.8	7.4	-9.7	2.8	37.4
Other consumer durables	23.7	0.1	10.5	-9.7	0.0	24.6
All consumer durables	154.0	-0.2	49.5	-48.9	2.8	157.1

Table 3 shows the balance sheet of consumer durables for 2008 per capita and household. An average household owns a value of 21.694 euros of consumer durables.

Table 3: Balance sheet of consumer durables for 2008* per resident and household

	Per resident	Per household
	€	
Textile and clothing	1051	2382
Leather goods and footwear	239	541
Home furnishing	2384	5401
Household appliances	1329	3011
Household articles	794	1799
Vehicles	2282	5170
Other consumer durables	1497	3391
All consumer durables	9577	21694

Table 4 shows the closing balance sheet of different types of consumer durables in volume indices for the years 1969-2008. Household appliances increased a lot in volume in this period, especially in the last decade.

Table 4: Balance sheet of consumer durables, volume indices (2000=100)

	1969	1980	1990	2000	2008*
Textile and clothing	65.3	73.8	80.2	100	114.9
Leather goods and footwear	67.3	74.6	81.6	100	105.4
Home furnishing	32.9	60.7	74.7	100	106.7
Household appliances	33.7	73.6	68.9	100	250.3
Household articles	21.0	45.7	59.9	100	143.1
Vehicles	25.0	49.4	65.6	100	116.5
Other consumer durables	53.1	80.0	81.4	100	114.5
All consumer durables	38.4	63.8	71.7	100	121.2

In table 5 the different types of consumer durables are given as a percentage of the total consumer durables for 1969, 1990 and 2008. It is notable that the share of textile and clothing was larger in 1969 than in 2008. This also applies to household appliances.

Textile and clothing is a necessity of life; everybody needs clothing. When wealth increases, consumers tend to increasing purchase other types of consumer durables. Their share in total consumer wealth will increase as total income and wealth increases.

The decrease in the share of household appliances in the value of the consumer durables is caused by audio and video equipment. Audio and video equipment have a decreasing expected service life. Together with an almost continuous decrease in price this explains audio and video equipment taking up a smaller share in more recent years. The sharp fall in prices more than counterbalanced the increase in volume.

The other household appliances on the other hand represent a bigger share in the total consumer durables in 2008 than in 1996. Nowadays, most households have for example a dishwasher, drier and microwave at their disposal, in 1969 this was not the case.

Table 5: Types of consumer durables as percentage of the total

	1969		1990		2008*	
	billion €	*%*	*billion €*	*%*	*billion €*	*%*
Textile and clothing	3.6	18.3	10.9	13.1	17.2	11.0
Leather goods and footwear	0.8	4.1	2.4	2.9	3.9	2.5
Home furnishing	4.2	21.2	20.1	24.2	39.1	24.9
Household appliances	2.9	14.6	12.0	14.5	21.8	13.9
Household articles	1.1	5.3	5.6	6.7	13.0	8.3
Vehicles	4.9	24.6	21.6	26.0	37.4	23.8
Other consumer durables	2.4	11.9	10.6	12.8	24.6	15.6
All consumer durables	19.9	100.0	83.1	100.0	157.1	100.0

4. Conclusions

This paper presents the balance sheets for the Netherlands of consumer durables. Capital stock totals in these balance sheets are, like those of fixed assets, compiled with the help of a Perpetual Inventory Method (PIM) covering the years 1953-2008. The paper discusses the various input requirements of this model, i.e. time series of final consumption expenditure, survival functions, age efficiency profiles, a discount rate and time series of second hand purchases of durable goods (motorcars) by households.

The Dutch balance sheets have information on seven different categories of consumer durables, each having their own estimated service lives.

In 2008 ownership in the Netherlands of consumer durables amounted to more than 157 billion euro, almost € 22,000 per household.

Over time, the relative importance of different types of consumer durables has been changing. In the past, textile and clothing and household appliances had larger shares in the total value of consumer durables than nowadays. In the latter case, the share of audio and video equipment in the total consumer durables was in 2008 lower than in former years, whereas the share of other household appliances was bigger.