Durable Goods and Household Saving Ratios in the Euro Area[1]

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1. Introduction

The purpose of this paper is to estimate the impact of the capitalisation of consumer durable goods on the euro area (EA) countries and the EA household saving ratios and disposable incomes. The reason for undertaking this exercise is twofold. Firstly, the System of National Accounts 1993 (SNA93) does not treat consumer durables as assets, even though they are generally regarded by individual households as such. Recently Jorgenson and Landefeld (2006) have recommended that consumer durables be both treated as assets and their services included in GDP. Secondly, the method of measuring of household saving ratios in the EA does not take into account the actual behaviour of households. This can be contrasted with the practice at the US Federal Reserve Board, which publishes two separate household net saving measures - one that adheres to the SNA93 treatment of consumer durables, and another that treats expenditure on consumer durables as an investment. The fact that the US uses two official saving ratios highlights the importance and usefulness of this kind of analysis; this paper seeks to extend this approach to the EA.

The result of this paper is that treating expenditure on consumer durables as investment increases the saving ratio in the EA between 6.8 and 7.6 per cent. This is lower than in the US, where the effect has been estimated to vary from 8 to 11 per cent.[2] In the US as well as in the EA this figure is relatively constant over time. In the EA there is considerably more variation between individual EA countries, depending on the capital stock and the price development of the individual goods. While the effect on the household disposable income growth rate is unremarkable, disposable income nevertheless increases by around 2.3 per cent.

This paper is structured as follows. Section 2 provides a theoretical background, comparing the approach taken in this paper to traditional national accounting techniques (specifically the SNA). This section also summarises the steps which will be taken in the estimation procedure part of the paper. Section 3 addresses the question of data availability and presents the estimation procedure for different components. Section 4 describes the results of this paper. Finally, Section 5 draws some conclusions.

2. Theoretical background

In the case of goods, the SNA distinguishes between durable and non-durable. This distinction is not based on physical durability as such, but rather on whether the goods are used once only, or whether they are used repeatedly or continuously. A consumer durable good is thus defined as one, which may be used repeatedly or continuously over a period of more than a year, assuming a normal or average rate of physical usage.[3]

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[2] See: Audenis, Grégoir and Louvot 2002.
[3] SNA93, paragraph 9.38.

In practice, the SNA93 measures household consumption only by expenditure and acquisitions. Household consumption of durables is treated as "other household consumption". Thus it is "commonly" assumed that the consumption of durables does not increase households' consumption possibilities in the future.[4] This means that durable goods are already consumed in the "use of disposable income account" and therefore diminish saving. They are definitely not considered as an investment in the "capital account" (where they would not diminish saving). Additionally, if they were classified as an investment, they would provide a service or an income flow to the household.

To recognise households' repeated use of durables, this article extends the production boundary by postulating that these durables are gradually used up in hypothetical production processes whose outputs consist of services. These services are then recorded as being acquired by households over a succession of time periods.[5]

Housing, on the other hand, is classified as an investment in the SNA93. Investment in housing increases future consumption possibilities, because housing investment produces a stream of housing services over time. This kind of stream of services could similarly be estimated for consumer durable goods; however, the SNA treats these as consumption on the grounds that household production is outside the scope of GDP.[6]

This is arguably inconsistent as many durables (such as cars or different kinds of machines) do create a stream of services. In this paper we attempt to estimate the effect of this treatment in the EA countries.[7] We also estimate the effect using an identical, systematic method for all the EA countries, and additionally analyse why the effect may vary between countries.

As already mentioned in the introduction, there are various ways and statistics to measure household saving. In this paper we base our analysis on the institutional sector accounts, and thus the saving ratio is defined as the ratio between the following economic transactions:

(1)   *Net household saving (B8) / [Net household disposable income (B6) + Adjustment for the change in equity of household pensions funds (D8)]*

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Net household saving (B8) / [Net household saving (B8) + Household final consumption (P3)]

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[4] See: SNA93, paragraph 9.40.
[5] Ibid.
[6] See: Perozek and Reindorf 2002.
[7] Some papers have already discussed this topic, and it has been assumed that in some EA countries, the effect on the saving ratio would be smaller than in the US, where it is estimated to vary between 8 and 11 per cent. See for instance: Audenis, Grégoir and Louvot 2002; Katz 1983. Additionally, the role of durables has also been investigated in some countries from the household wealth

To estimate a household saving ratio for the EA countries adjusted for capitalised consumer durables and based on sector accounts, the following steps must be taken:[8]

- Expenditure on the purchase and maintenance of consumer durables must be deducted from household final consumption expenditure.

- The imputed rental value for consumer durables must be added to household final consumption expenditure.

- The imputed rental value for consumer durables less maintenance costs and taxes on production and imports (which include vehicle registration charges) must be added to the gross operating surplus of households.

- Households must deduct motor vehicle registration charges from other direct taxes payable.

- Expenditure on the purchase of consumer durables must be added to gross fixed capital formation.

-Consumption of fixed capital for consumer durables must be included in the consumption of fixed capital for households.

3. Data availability and estimating procedure

This section addresses two main aspects: available and used data (sub-section 3.1) and the estimation procedure of output, intermediate consumption and taxes, and consumption of fixed capital (sub-sections 3.2-3.4).

3.1. Available and used data

Data in Table 8 the ESA95 transmission programme include non-financial accounts by institutional sector.[9] Luxembourg and Ireland do not compile sector accounts, and therefore cannot be included in the analysis. Moreover, some EA Member States compile statistics where the household sector and non-profit institutions serving households are treated as one sector. Therefore, non-profit institutions serving households are also included in the household sector in this analysis. This obviously ensures better comparability between Member State estimates. At the end of May 2006, the ECB and Eurostat published for the first time institutional sector accounts for the EU25 as well as for the euro area. This paper also includes these euro area estimates.[10]

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point of view. See for instance: Aron and Muellbauer 2006. Additionally, alternative saving ratios are presented for instance in: ABS, 2002 and Reindorf and Yan, 2002.
[8] See: Harvey 2003.
[9] See: Questionnaire ESA95, Tables, Eurostat.
[10] More information and the data can be found for instance at: http://www.ecb.int/press/pr/date/2006/html/pr060531.en.html

Household consumption estimates broken down by goods are available for each EA Member State. This data is the so-called Table 5 of the ESA95 transmission programme. These series normally begin at the end of the 1980s. In order to estimate the consumption of fixed capital and the other necessary flows and stocks when capitalising consumer durables, we have limited our analysis to the period 1999-2003. In addition, with the aim of maintaining consistency between the Member State and EA price indexes, we have calculated an alternative price index for the EA by using Member State implicit price indexes. The reason for this is that due to different timing with regards to introducing chain-linking, the EA price indexes differed from the aggregation of the Member State ones. The price indexes for each group of EA consumer durables were aggregated from the Member States' deflators using Törnqvist weights.[11] These price indexes were then used to deflate the current price series to obtain estimates in constant prices for the euro area.

There is however a problem using Table 5 data of the ESA95 transmission programme. First, the data are too aggregated in order to distinguish durable goods from non-durable ones. Therefore, certain assumptions had to be made when these data were used (see later in this article for more details). Slightly more detailed data than data from Table 5 of the transmission programme would be available in supply and use tables, but unfortunately the series only begin in 1995 or even later. Thus, the series would be too short to compile capital stocks that are a necessary intermediate step in estimating the consumption of fixed capital. In addition, extrapolation of the supply and use table series is not reasonable because the applied classifications in the two data sets are different. Table 5 data are classified using the COICOP classification, whereas supply and use tables are classified using the CPA classification.

Harchaoui and Tarkhani (2004) have capitalised consumer durables in order to calculate the effects of consumer durables on productivity and GDP in Canada. They use a more detailed classification than we did for private consumption in order to classify durable and non-durable goods. This is certainly easier when focusing on only one country, but much more difficult for international comparisons, because the databases maintained by either international or European organisations do not currently include more detailed data on private consumption. The level of detail used in this paper is the most disaggregated level at which the European aggregates are available.

For car registration fees, no consistent source for all of the countries was available. Therefore, three different sources and estimation methods were used. Finland, Greece and the Netherlands provided data directly. Austria, Belgium, Greece, Italy, Spain and Portugal have their data in Eurostat's New Cronos database. The latter is recorded under the ESA95 transmission code D241 "Car registration fees". New Cronos data are used as primary data. However, when New Cronos data are not available, the data delivered by countries have been used. There was however a level difference between the data delivered by the countries and that

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[11] That is, the weights were the arithmetic averages of year *t* and year *t-1* nominal shares.

obtained from the New Cronos. For that reason, we considered Eurostat data to be more comparable and consistent between different countries than the data delivered by individual countries.

The data used for rates of return are based on the ECB's Monetary Financial Institution (MFI) statistics. The weights for the rates of return were calculated from the Monetary Union Financial Accounts (MUFA). The exact computational procedure will be explained in sub-section 3.2.

3.2. Estimation of output

In this paper, consumer durables are treated in the same way as imputed rents in the national accounts. In principle, the logic of capitalising durable goods follows exactly the same logic as imputed rents. The SNA postulates that heads of households who own the dwellings that the households occupy are formally treated as owners of unincorporated enterprises that produce housing services consumed by those same households. As well-organised markets for rented housing exist in most countries, the output of own-account housing services can be valued using the prices of the same kinds of services sold on the market, in line with the general valuation rules adopted for goods or services produced on one's own account. In other words, the output of housing services produced by owner-occupiers is valued at the estimated rental that a tenant would pay for the same accommodation, taking into consideration factors such as location, neighbourhood amenities, and so forth, as well as the size and quality of the dwelling itself. The same figure is recorded under household final consumption expenditure.[12]

The rental markets for durables are not necessarily as well organised as the rented housing market, and thus it is difficult to find prices for similar services. For this reason, the output of rented consumer durables is calculated as a user cost or rental price. This is defined as the rate of return plus depreciation, minus capital gain/loss plus an interaction term:

$$(2) \qquad r_t = p_{(t-1)}(q_t + d_t - \pi_t + d_t\pi_t),$$

where, r is the user cost, p designates the price index for new capital goods, q is the rate of return, d is the rate of depreciation and π is the holding gain or loss, i.e. the change in prices from time t-1 to time t (Hall and Jorgenson 1967; Ho, Jorgenson and Stiroh 1999; Diewert, Harrison and Schreyer 2004). The subscript denoting asset type has been suppressed for economy of exposition. The annual price changes were smoothed using a Hodrick-Prescott (1997) filter.[13] The rate of return was calculated using the exogenous, ex-post method.

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[12] SNA93, paragraph 6.89.
[13] The smoothing parameter λ=100 was used.

In previous empirical studies, a variety of different methods have been used to estimate rates of return. Many previous studies have applied debt and equity portions of the value of net stocks applied to borrowing rates in order to calculate rate of return.[14] This paper, in contrast, assumes that households hardly take out any loans to finance their purchases of durable goods. Debt and borrowing rates are therefore not applicable. Instead, we assume that households pay for durables out of spare income, which would otherwise be invested on the financial markets. This we term the alternative return. The weights of alternative return for durable goods have been calculated from the annual MUFA. Three different categories of assets have been used in the calculation: currencies and deposits, shares, and debt securities (including mutual funds). The returns of the currencies and deposits were calculated by using one-month Euribor (Euro Interbank Offered Rate). The returns of shares were calculated by using the Dow Jones Euro STOXX price index, and finally, the returns of debt securities were calculated by using the three-year euro area Government benchmark bond yield.

This approach can certainly be criticised because it does not take into account household debt, which could be included in this analysis for two reasons. First, one alternative to buying a durable is to repay the debt. However, as mortgage programmes are often fixed, this is not seen as an alternative to buying a durable. Second, it can be assumed that a loan has been taken out to buy a durable. Then the alternative cost would be not paying the interest for the loan. Loans are mainly taken only for vehicles, and hence this argument does not apply to all durables. Additionally, the published MUFA data do not distinguish mortgages from consumption loans. Therefore, it is rather difficult to make this estimation for the euro area.

The problem of estimating the exogenous, ex-post, rate of return is that due to the bursting of the stock exchange bubble, it is negative in the period 2001-2003. There are several ways to avoid this problem. The rate of return can be defined as for instance a three- or five-year moving average. Alternatively, the series can be smoothed using a filter. Figure 1 presents all these three options. In the final calculations the smoothed rates of return were used where the short-term variation is eliminated by using a Hodrick-Prescott filter. The moving average series have the downside that several observations would be lost. Additionally, as can been seen in Figure 1, the volatility of the moving average series is still high.

The final step needed to calculate the outputs is to multiply the user cost with the constant price average[15] stock of consumer durables in the year in question:

(3) $\qquad cpYCD_t = r_r \overline{SCD_t}$.

Section 3.4 describes how we calculated the stocks of consumer durables by type of asset.

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[14] See Katz (1983) for a rather comprehensive list of different methods used in empirical studies.
[15] Year *t* and *t-1* average since the stock is the year-end situation and the other economic transactions are valued at the average prices of the year.

Figure 1. Rates of return for consumer durables. Basic index, 3 years moving average index, 5 years moving average index and smoothed index, %.
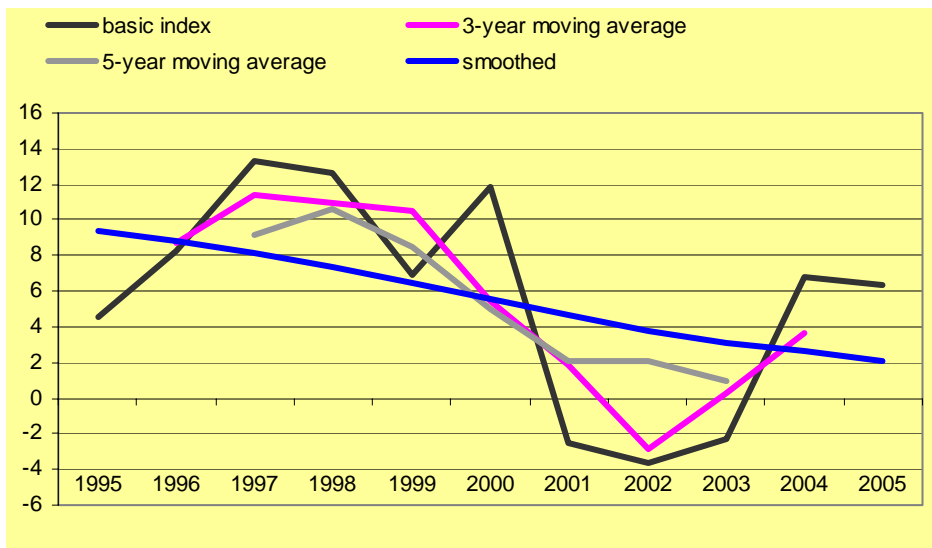
3.3. Estimation of intermediate consumption and other taxes on production

Theoretically, the maintenance and repair costs of personal vehicles could be included in intermediate consumption. Maintenance costs are indeed included in "operation of personal transport equipment"[16] in the COICOP classification. This group also includes fuels and lubricants for personal transport. Fuels and lubricants cannot be classified as a part of intermediate consumption because this category consists of the value of the goods and services consumed as inputs by a process of production, excluding fixed assets, whose consumption is recorded as consumption of fixed capital.[17] The use of fuel is not involved in the actual "renting or production process", and therefore is counted as private consumption expenditure. This follows a similar logic as in imputed rents, where heating costs are counted as part of private consumption expenditure.

However, by using the transaction detail provided by the ESA95 transmission programme, fuels cannot be separated from maintenance costs. Maintenance costs cover only a small part of the operating cost of personal transport equipment. Owning to this classification problem, this paper assumes that maintenance costs are zero, and thus the intermediate consumption of durable goods is zero as well. Presumably, the estimation error made here is relatively small, since maintenance costs are most likely to be modest in relation to the price of a durable good.

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[16] COICOP code 07.2.

According to the ESA95, other taxes on production (D29) consists of all taxes that enterprises incur as a result of engaging in production independently of the quantity or value of the goods and services produced or sold. Other taxes on production include in particular taxes on the use of fixed assets (vehicles, machinery and equipment) for purposes of production, whether or not such assets are owned or rented.[18] Therefore car registration fees have to be added to taxes on production and deducted from other taxes payable.

As mentioned in sub-section 3.1, there is either data from the New Cronos database or data delivered by the Member States themselves. These data have been used in the estimations when available. For the EA, data are unavailable and, therefore an aggregation of Member State data has been used. Direct data are available for all countries apart from Germany and France, where car registration fees were estimated by calculating average registration fees per car for which the data were available. Then the number of the registered cars was multiplied with the average value. The stock of passenger cars, i.e. the number of registered cars, was obtained from the International Road Federation's World Road Statistics 2005.

3.4. Estimation of consumption of fixed capital

Private consumption is divided into services and goods that can be classified durable, semi-durable or non-durable. Unfortunately we lacked detailed data on expenditure on durables. Therefore we used Finnish National Accounting figures from July 2005 of the annual share of consumer durables in each two-digit COICOP[19] consumption group. We took the 1975-2003 average shares[20] in Finland, and multiplied these shares with the national two-digit current price consumption expenditure figures, which we downloaded from the ECB's database. Having also downloaded the national two-digit expenditure figures at 2000 prices, we calculated the implicit price index that was used to deflate the consumer durables into constant prices. For those countries (see the appendix for details) that the time series did extend as far as 1970 we used the volume of total consumer expenditure for each country to estimate back data; in the case of the euro area we used German volume changes by type of asset.

Having compiled the required consumer durable series in constant prices, we then applied the following perpetual inventory equation to obtain year-end stocks of consumer durables:

$$(4) \qquad SCD_t = SCD_{t-1}(1-d) + I_t = \sum_{\tau=0}^{\infty} (1-d)^{\tau} I_{t-\tau} \, ,$$

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[17] ESA95, 3.69.
[18] ESA95, 4.29.
[19] COICOP stands for Classification of Individual Consumption by Purpose Adapted to the Needs of Harmonized Indices of Consumer Prices (2000). See http://europa.eu.int/comm/eurostat/ramon/
[20] The shares were: C05.1 Furniture and furnishings, carpets and other floor coverings: 95.3%, C05.3 Household appliances: 81.3%, C05.5 Tools and equipment for house and garden: 39.2%, C06.1 Medical products, appliances and equipment: 35.9%, C07.1 Purchase of vehicles:100%, C08.1 Postal services: 5.8%, C09.1 Audio-visual, photographic and information processing equipment:

where *SCD* denotes stock of consumer durables, *I* is investment, *d* is the rate of depreciation and *t* is time. The symbol for the type of consumer durable has been left out for notational simplicity. The rates of depreciation used can be seen in Table 1.

Table 1. Depreciation rates by type of consumer durable.

code	asset type	depreciation rate	source
C05.1	Furn. and furnish., carpets and oth. floor cov.	0.1179	Fraumeni 1997
C05.3	Household appliances	0.1500	Fraumeni 1997
C05.5	Tools and eq. for house and garden	0.1650	Fraumeni 1997
C06.1	Medical prod., appl. and eq.	0.2750	Fraumeni 1997
C07.1	Purchase of vehicles	0.2720	Jorgenson and Stiroh 2000
C08.1	Postal services	0.1833	Fraumeni 1997
C09.1	Audio-vis., photogr. and inform. proc. eq.	0.1833	Fraumeni 1997
C09.2	Oth. major dur. for recr. and culture	0.1650	Fraumeni 1997
C12.1	Personal care	0.1650	Fraumeni 1997
C12.3	Personal effects n.e.c.	0.1500	Fraumeni 1997

After compiling the stocks of consumer durables the depreciation rates can be computed using the equation:

$$(5) \qquad CFC_t = I_t - (SCD_t - SCD_{t-1}),$$

where CFC denotes depreciation in millions of year 2000 euro. Finally, current price depreciation was obtained by multiplying the constant price depreciations with their respective price indexes.

4. Results

4.1. Gross rate of return, output and consumption of fixed capital

The gross rate of return is the part of equation 2 within brackets, that is:

$$(6) \qquad GRR_t = q_t + d_t - \pi_t + d_t \pi_t.$$

The gross rates of return in the euro area by type of consumer durable can be seen in Table 2. (These have of course also been calculated for the individual Member States, but these rates are not shown here to save space – they can be obtained on request from the authors.) The gross rates of returns are asset-specific and since we are assuming identical net rates of returns for all assets the gross rates of return are in any particular

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74.6%, C09.2 Other major durables for recreation and culture: 96.3%, C12.1 Personal care: 2.8%, C12.3 Personal effects n.e.c.:

year driven by differences in depreciation rates and asset inflation rates. The highest gross rates of return can be found in groups C06.1 and C07.1, which have also the highest depreciation rates. Over time, however, there is a decline across the board in all gross rates of return. This largely stems from declining net rates of return (see Figure 1).

Table 2. Gross rates of return for consumer durables in the euro area, 1999-2003.

	1999	2000	2001	2002	2003
C05.1	18.3 %	17.4 %	16.4 %	15.6 %	15.0 %
C05.3	21.6 %	20.7 %	19.7 %	18.9 %	18.2 %
C05.5	22.9 %	21.9 %	21.0 %	20.2 %	19.5 %
C06.1	34.3 %	33.4 %	32.4 %	31.6 %	30.9 %
C07.1	33.6 %	32.6 %	31.7 %	30.9 %	30.2 %
C08.1	25.0 %	23.9 %	22.9 %	22.0 %	21.4 %
C09.1	24.9 %	23.9 %	23.0 %	22.2 %	21.5 %
C09.2	23.0 %	22.1 %	21.1 %	20.3 %	19.6 %
C12.1	22.9 %	22.0 %	21.0 %	20.2 %	19.5 %
C12.3	21.4 %	20.5 %	19.5 %	18.7 %	18.0 %

Source: authors' calculations. Underlying data: ECB.

Table 3. User costs of consumer durables in the euro area, 1999-2003

	1999	2000	2001	2002	2003
C05.1	19.3 %	18.7 %	17.9 %	17.4 %	17.0 %
C05.3	21.7 %	20.9 %	19.9 %	19.1 %	18.4 %
C05.5	23.1 %	22.5 %	21.6 %	21.1 %	20.7 %
C06.1	37.1 %	36.3 %	35.6 %	33.9 %	33.6 %
C07.1	33.9 %	33.2 %	32.6 %	32.2 %	32.0 %
C08.1	24.5 %	22.0 %	20.0 %	18.8 %	18.1 %
C09.1	20.6 %	18.3 %	16.7 %	15.1 %	13.8 %
C09.2	24.0 %	23.6 %	23.0 %	22.7 %	22.3 %
C12.1	24.1 %	23.6 %	23.0 %	22.7 %	22.6 %
C12.3	22.0 %	21.2 %	20.5 %	20.1 %	19.8 %

Source: authors' calculations. Underlying data: ECB.

In order to estimate the output of consumer durables in current prices, we calculated the user cost in Table 3, shown as a percentage price of a new asset, using equation 2. Then we multiplied the user costs with the average constant price stocks of consumer durables by asset type (see Table 4). The major part of the output is consumption of fixed capital for the consumer durables as can be seen in Table 5.

The table shows that there is a shift in the level of total consumption of fixed capital, which comprised 72 per cent of total output in 1999, compared with 85 per cent in 2003. The most rapid relative increase was in asset group C08.1, where the ratio experienced a gain of 17 percentage points owning to fast capital stock growth. The most modest relative increase was in group C06.1, which only gained 9 percentages.

51.4%.

Table 4. Output of consumer durables in the euro area in current prices in millions of Euros, 1999-2003

	1999	2000	2001	2002	2003
C05.1	129768	127713	124736	122554	120440
C05.3	35929	35657	35124	34936	34778
C05.5	7034	7002	6898	6864	6871
C06.1	21243	21568	21877	21569	22174
C07.1	188398	192460	194128	195127	195538
C08.1	3643	3643	3754	3944	4174
C09.1	44500	43594	43866	43551	43142
C09.2	11244	11386	11485	11715	11787
C12.1	2789	2798	2787	2804	2834
C12.3	27561	27119	26720	26456	26172

Source: authors' calculations. Underlying data: ECB.

Table 5. Consumption of fixed capital of consumer durables in the euro area in current prices in millions of Euros, 1999-2003

	1999	2000	2001	2002	2003
C05.1	84360	87095	90557	94011	96274
C05.3	24676	25364	26369	27303	28119
C05.5	5087	5248	5422	5650	5829
C06.1	16795	17615	17887	18690	19582
C07.1	150286	159494	167080	173278	178008
C08.1	2377	2497	2743	3091	3452
C09.1	28900	30073	31303	32409	32947
C09.2	8137	8526	9069	9542	10016
C12.1	2030	2108	2226	2337	2429
C12.3	19314	19937	20870	21632	22097

Source: authors' calculations. Underlying data: ECB.

4.2. Saving, disposable income and household consumption

Table 6 presents the contribution of the capitalisation of durables on household saving ratios. The results are more or less in line with those assumed or presented in previous papers, in particular Audenis, Grégoir and Louvot (2002), who estimated figures for France and the US, but not for the EA. They estimate that the effect in the US is ranging from 8 to 11 per cent, whereas our calculations show a lower impact in Europe of 6.8 to 7.6 per cent. However, the overall figures conceal considerable variation in individual Member States, with the effect in some countries such as Finland and the Netherlands at 10 or 11 per cent in some years.

It should be borne in mind that comparison of our results with the US estimates is not straightforward, owning to methodological differences, such as the level of aggregation used in the calculations. It is nevertheless heartening to note that Audenis, Grégoir and Louvot (2002) reported that durable goods had a 6.3 percentage points effect on the French household saving ratio in year 2000 whereas our estimate for the

same year was 5.7 percentage points. The results are very similar though there are methodological differences.

Table 6. Contribution of capitalisation of durables on the household saving ratios, percentage points, 1999-2003

	1999	2000	2001	2002	2003
Austria	6.67	6.82	6.70	6.62	6.61
Belgium	4.51	4.79	4.44	4.25	4.54
Germany	6.66	6.75	7.13	6.73	6.50
Spain	9.13	8.10	8.05	7.36	7.40
Finland	9.79	9.95	9.15	9.63	10.68
France	5.64	5.65	5.62	5.41	5.32
Greece	8.84	7.62	8.01	8.38	8.14
Italy	8.62	8.82	8.12	7.86	7.72
Netherlands	10.98	11.58	10.43	10.59	10.07
Portugal	10.20	8.85	6.97	6.16	5.32
Euro Area	7.47	7.56	7.34	6.99	6.80

Source: authors' calculations. Underlying data: ECB.

Where the findings of this paper depart from Audenis, Grégoir and Louvot is their conclusion that the magnitude of the difference between the sizes of the two saving ratios is directly related to the share of expenditure on durable goods in income. The results in this paper largely contradict this view. For instance in Germany the effect varies between 6.5 and 7.1 per cent with the share of durable goods in disposable income slightly less than 17 per cent, whereas in Finland the effect varies between 9 and 11 per cent, although the share of durables in disposable income is almost the same as in Germany (see tables 6 and 7).

As hinted in the previous sub-section different inflation rates and the actual underlying capital stock, coupled with the different depreciation rates for different products affects, also affect the contribution of durables to saving ratios. In Germany and Austria, these factors seems to have such a strong effect that they cancel out the certainly intuitively plausible thought of a high durables' share of the household disposable income implying a high effect on the saving ratio.

Table 7. Durables' share of the household disposable income (the current SNA concept), per cent (%), 1999-2003

	1999	2000	2001	2002	2003
Austria	16.88	16.67	16.62	16.55	16.35
Belgium	12.75	12.95	12.69	12.70	13.17
Germany	16.82	16.76	16.85	16.52	16.14
Spain	16.92	15.71	15.76	15.02	15.04
Finland	16.94	17.00	16.43	16.71	17.35
France	12.96	12.75	12.62	12.35	12.29
Greece	12.94	11.95	12.27	12.51	11.98
Italy	18.20	18.33	17.52	17.22	16.91
Netherlands	20.02	20.72	18.93	19.48	19.45
Portugal	19.56	17.76	16.18	15.44	15.53
Euro Area	16.05	16.06	15.72	15.37	15.13

Source: authors' calculations. Underlying data: ECB.

Table 8 presents contribution of capitalisation of durables on the growth rate of household consumption expenditure. The effect does not seem to be large in EA member states. Mostly, the observed effects is less than one percentage point. At the EA-level the effect seems to be even smaller than at the member state level. The reason for this is that the individual member state negative and positive effects seem to cancel out the effect at the EA-level.

Table 8. Contribution of capitalisation of durables on the growth rate of household consumption expenditure, percentage points, 2000-2003

	2000	2001	2002	2003
Austria	-0.80	-0.40	-0.32	-0.46
Belgium	-0.54	-0.18	-0.01	-0.41
Germany	-0.67	-1.00	-0.07	-0.07
Spain	0.68	-0.36	0.47	-0.55
Finland	-0.33	0.37	-0.91	-1.20
France	-0.52	-0.50	-0.17	-0.07
Greece	1.58	-1.15	-0.55	0.19
Italy	-0.71	0.26	-0.24	-0.16
Netherlands	-0.81	0.16	-0.19	0.47
Portugal	0.72	1.38	0.53	0.37
Euro Area	-0.58	-0.33	-0.04	-0.07

Source: authors' calculations. Underlying data: ECB.

As can be seen in table 9, the contribution of capitalisation of durables on the growth rate of disposable income is approximately half a per cent. As in the case of the household consumption expenditure, the effect is diminishing over time. The reason is that the estimation of the output is effected by the rate of return. The rate of return was high in year 2000 due to booming stock markets but when the stock markets were busting,

also the rate of returns diminished. This trend can clearly be seen in tables 8 and 9. The diminishing rate of return also explains mostly the negative contribution of durables on the growth rates.

Table 9. Contribution of capitalisation of durables on the growth rate of disposable income, percentage points, 2000-2003

	2000	2001	2002	2003
Austria	-0.65	-0.61	-0.41	-0.38
Belgium	-0.31	-0.55	-0.27	-0.17
Germany	-0.60	-0.52	-0.52	-0.31
Spain	-0.68	-0.44	-0.39	-0.46
Finland	-0.35	-0.61	-0.29	0.11
France	-0.52	-0.47	-0.35	-0.26
Greece	0.00	-0.81	-0.23	-0.09
Italy	-0.52	-0.51	-0.55	-0.33
Netherlands	-0.54	-1.07	-0.15	-0.19
Portugal	-0.89	-0.77	-0.46	-0.48
Euro Area	-0.52	-0.54	-0.43	-0.31

Source: authors' calculations. Underlying data: ECB.

Table 10 presents the contribution of capitalisation on the level of disposable income. Averaged over the period 1999-2003 the effect varies between 1.5 and 3.0 per cent of disposable income. The share is actually surprisingly small taking into account that the effect on the growth rates is also around 0.5 percentage points. This reflects the volatility of the estimates. A similar diminishing effect of durables on the level of disposable income can also be observed though it is not presented in table. The results and calculations of this paper can be received on request from the authors.

Table 10. Contribution of capitalisation of durables on the level of disposable income, percentage points, average over the period 1999-2003

	1999-2003
Austria	2.78
Belgium	1.76
Germany	2.69
Spain	1.82
Finland	2.19
France	1.95
Greece	1.65
Italy	2.47
Netherlands	2.43
Portugal	2.24
Euro Area	2.26

Source: authors' calculations. Underlying data: ECB.

5. Conclusions

The purpose of this paper was to estimate the impact of the capitalisation of consumer durable goods on the household saving ratios and disposable income of EA countries and on the EA-aggregate. We found that the saving ratios are in the euro area underestimated by approximately seven percentage points when treating consumer durables as is the present convention. The effect varies a lot of between Member States and in some member states capitalisation affects as much as 11 percentage points of household saving. The level of EA disposable income is increased by 2.3 per cent due to capitalising durables and the growth of disposable income decreases annually around 0.5 percentage points. The effect on the growth rate of disposable income is actually surprisingly large considering that the effect on the level is modest. We concluded that the reason is the volatility in the underlying data, in particular the diminishing net rate of return.

We concluded that the capitalisation effect is not necessarily directly related to the share of expenditure on durable goods in income. Different inflation rates and the underlying capital stock, coupled with different depreciation rates for different asset types also affect the contribution of durables to saving ratios.

Whereas SNA93 does not consider expenditure on consumer durables to increase future consumption possibilities, e.g. Jorgenson and Landefeld (2006) disagree. We are also among those who think that consumer durables should be both treated as assets and their services recorded in the national accounting framework. This could be done either in the actual core accounting system or in separate satellite accounts. Failure to do so distorts the statistics on households' disposable incomes, saving ratios and net lending or borrowing that are needed for economic policy and academic research.

The future challenge for the authors is to extend this analysis to productivity measures by capitalising durable goods in intermediate consumption. This should be feasible for the EA by combining supply and use and other national accounts data.

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