MEASURING THE STOCK OF CONSUMER DURABLES AND ITS IMPLICATIONS FOR EURO AREA SAVINGS RATIOS

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The purpose of this article is to estimate the impact of capitalizing durable goods on the euro area household saving ratios and disposable incomes for the first time. The reason for this exercise is twofold. Firstly, it is generally accepted that individual households regard consumer durables as assets even though they are not treated as such in the System of National Accounts 1993. Secondly, the issue is related to the definition of household saving ratios. For instance, the U.S. Federal Reserve Board publishes three household saving measures. The main difference between these saving ratios is that one is derived by treating expenditure on consumer durables as investments while the other two are compiled by considering them to be household final consumption expenditure. We find that the effect of capitalizing consumer durables on EA saving ratios is moderate. The impact is lower than it is in the U.S.

1. Introduction

The purpose of this article is to estimate the impact of the capitalization 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. The idea of capitalizing consumer durable goods in the national accounting framework has been discussed for many years.[1] This treatment has also been suggested to be considered to be changed during the currently

ongoing SNA update. The proposal was rejected because it was argued that the issue entails a fundamental change of the production and asset boundaries. However, the Inter-Secretariat Working Group on National Accounts (ISWGNA) proposed to record capitalized consumer durable goods in satellite accounts. Moreover, the group recommended showing consumer durable goods as a memorandum item in the balance sheet but not in the totals of non-financial assets (Harrison, 2006).

The U.S. Bureau of Economic Analysis already publishes estimates of stocks of consumer durables alongside estimates of stocks of fixed assets. Recently Jorgenson and Landefeld (2006) recommended that consumer durables be both treated as assets and their services included in supplementary GDP accounts. Also Hulten (2006) relates capital to such expenditure that is made in order to increase or maintain future consumption in contrast with current consumption.

Secondly, the method of measuring household saving ratios in the EA does not take into account the actual behavior of households. This can be contrasted with the practice in the U.S. where three alternative measures of personal saving are presented: the National Income and Production Accounts (NIPA) measure and two versions of flow of funds measures. The broader flow of funds measure includes among other items net investment in consumer durables, while the narrower measure, which is conceptually in line with the NIPA concept, does not. The fact that the U.S. uses different official saving ratios highlights the importance and usefulness of this kind of analysis; this article seeks to extend this approach for the first time to the EA.

The result of this article is that treating expenditure on consumer durables as investment increases the saving ratio in the EA between 0.5 and 1.5 percent. This is lower than in the U.S., where the effect has been estimated to vary from 1 to 3 percent (Reinsdorf, 2007).[2] In the U.S. 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 percent.

This article is structured as follows. Section 2 provides a theoretical background, comparing the approach taken in this article to official national accounting methodology (SNA93). This section also summarizes the steps which will be taken in the estimation procedure part of the article. Section 3 addresses the question of data availability and presents the estimation steps. Section 4 describes the results of this article. In the final section some conclusions are drawn.

2. Theoretical Background

In the case of goods, the SNA93 distinguishes between durable and nondurable. 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

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[2]However, for instance Audenis *et al.* (2002) have estimated the effect to be between 8 and 11 percent. Apparently they treated COICOP categories that included durable goods as if they consisted entirely of durables and their estimates were missing depreciation. Please also note that the estimates in this article have been revised compared to the version presented at the IARIW conference 2006.

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 (SNA93, §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 assumed that the consumption of durables does not increase households' consumption possibilities in the future (SNA93, §9.40). 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 recognize 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 (SNA93, §9.40).

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 SNA93 treats these as consumption on the grounds that this kind of household production is outside the scope of GDP (Perozek and Reinsdorf, 2002).

This is arguably inconsistent as many durables (such as cars or different kinds of machines) do create a stream of services. In this article we attempt to estimate the effect of this treatment in the EA countries.[3] We also estimate the effect using an identical, systematic method for all the EA countries, and moreover, analyze why the effect may vary between countries. Our analysis is based on the theoretical concept of capital services based on the concept of productive capital as originally formulated by Jorgenson and Griliches (1967). The flow of capital services can be perceived as representing the services of fixed capital analogously to labor representing the services of human capital in production. Each of the vintages of the capital stock is converted into a standard "efficiency" unit; i.e. productive capital stocks (see OECD, 2001).[4] When multiplying the user cost of capital[5] with the productive capital stock the cost of capital services is obtained (see also Schreyer *et al.*, 2005). This procedure, as will be shown later, is also how we calculate the output of consumer durables.

According to the SNA93, capital stock measures are needed in the production account and for balance sheets. In the national accounts there are two measures of capital stocks: the gross capital stock and the net capital stock. The gross capital stock (GCS) is the value of the capital used in production, valued at "as new"

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[3]See also Katz (1983). The role of durables has also been investigated in some countries from the household wealth point of view. See, for instance, Solomou and Weale (1997), Brandolini *et al.* (2004), and Aron and Muellbauer (2006). Furthermore, alternative saving ratios are presented in ABS (2002) and Reinsdorf and Yan (2002).

[4]This is done with equation (4) in Section 3.4.

[5]See equation (2) in Section 3.2.

TABLE 1

NUMERICAL EXAMPLE OF DURABLE GOODS' EFFECT ON EA SAVING, 1999

SNA93 code	Transaction	Traditional Measure	Adjustment for Durable Goods	Adjusted Measure
P1	Output		425	
P2	Intermediate consumption		0	
K1	Consumption of fixed capital		342	
B2N	Operating surplus, net		83	
D29	Other taxes		19	
D59	Other current taxes		19	
B6	Disposable income	3,997	83	4,080
P31	HH consumption expenditure	3,666	14	3,680
P311	Consumption expenditure on durable goods	411		
D8	Adjustment for the change in equity of household pension funds	45		
B8	Saving	376		445
P51	Gross fixed capital formation		411	

Source: Authors' calculations. Underlying data: Eurostat/ECB.

prices, i.e. regardless of age or actual condition, at a certain point in time. GCS consists of the value of the cumulated past investments less the cumulated retirements of fixed assets. A capital good is retired from the capital stock when its service life expires. The gross capital stock does not take into account the possible decline in the capital good's productive capacity as it ages. Net capital stock (NCS) is the market value of the capital in use. The net value of the capital good is defined as the current purchaser's price of a new asset of the same type less the cumulated consumption of fixed capital (SNA93, §6.199). The NCS is used to compute consumption of fixed capital according to the SNA93. It is the difference between gross value added and net value added (or GDP and NDP). Furthermore, in national accounts the consumption of fixed capital has an impact on gross output only in the case of non-market production. This is not the case with capital services calculations. Capital services (including consumption of fixed capital) are computed in an integrated way by multiplying productive capital stocks with their user costs. That ensures full coherence of the accounts.[6]

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

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

To estimate a household saving ratio for the EA countries adjusted for capitalized consumer durables and based on sector accounts, the following steps must be taken (Harvey, 2003; ECB, 2004) (see Table 1):

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[6]See also Schreyer *et al.* (2005).

- Expenditure on the purchase and maintenance of consumer durables must be deducted from household final consumption expenditure (in Table 1: EUR 3,666 – EUR 411 = EUR 3,255).
- The imputed rental value for consumer durables must be added to household final consumption expenditure (in Table 1: EUR 3,255 + EUR 425 = EUR 3,680 (adjusted household 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 (in Table 1: EUR 425 – EUR 0 – EUR 342 = EUR 83 (operating surplus) – EUR 19 = EUR 64).
- Households must deduct motor vehicle registration charges from other direct taxes payable. This is a reclassification of the vehicle registration fees from other taxes payable to taxes on production and imports (in Table 1: EUR 19 (D59) + EUR 64 (above) = EUR 83 (disposable income)).
- Expenditure on the purchase of consumer durables must be added to gross fixed capital formation (Table 1: EUR 411 (P51)).
- Consumption of fixed capital for consumer durables must be included in the consumption of fixed capital for households (Table 1: EUR 342 (K1)).

3. Data Availability and Estimating Procedure

3.1. *Available and Used Data*

Data in Table 8 of the ESA95 Transmission Programme include non-financial accounts by institutional sector.[7] Luxembourg and Ireland do not compile the whole set of the accounts for the whole time span, and cannot therefore 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 article also includes these euro area estimates.[8]

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 capitalizing consumer durables, we have limited our analysis to the period 1999–2003.[9] In addition, with the aim of maintaining consistency between

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[7]The ESA95 Transmission Programme currently in force is Regulation (EC) No 1392/2007 of the European Parliament and of the Council.

[8]More information and the data can be found at: http://www.ecb.int/press/pr/date/2006/html/pr060531.en.html

[9]Non-financial accounts by institutional sector for Europe are available only from 1999 onwards. Moreover, when the calculations were done some Member States had not delivered their Table 5 data of the ESA95 Transmission Programme after statistical year 2003. This was the reason to limit the analysis to 2003.

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 regard 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.[10] 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. Unfortunately, more detailed information is not available in international databases on national accounts data. The only way of receiving "hard data" at national level would be to collect it directly from national statistical offices as many countries do compile data at a more detailed level than is transmitted to international institutions. Thus, in order to allow this kind of analysis, the ESA95 Transmission Programme should be extended to cover household consumption expenditures cross-classified by COICOP and durability. Therefore, certain assumptions had to be made when these data were used (see later in this article for details). Slightly more detailed data than those which are available from Table 5 of the Transmission Programme would be accessible 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 consumption of fixed capital. In addition, extrapolation of the supply and use table series is not reasonable because the applied classifications in the two datasets are different. Table 5 data are classified using the COICOP[11] classification, whereas supply and use tables are classified using the CPA[12] classification. The durables have been separated from Table 5 aggregates as described in Section 3.4.

Harchaoui and Tarkhani (2004) have capitalized 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 international organizations do not currently include more detailed data on private consumption. The level of detail used in this article 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

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

[11]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/

[12]CPA stands for Statistical Classification of Products by Activity in the European Economic Community, 2002 version. See http://europa.eu.int/comm/eurostat/ramon/

registration fees." New Cronos data are used as primary data. However, when New Cronos data were not available, the data delivered by countries have been used. There was, however, a level difference between the data delivered by the countries and those 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. For France and Germany the number of passenger cars was used as a proxy to estimate the amount of car registration fees.

3.2. *Estimation of Output*

In this article, consumer durables are treated in the same way as imputed rentals in the national accounts. The SNA93 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-organized 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, neighborhood amenities, and so forth, as well as the size and quality of the dwelling itself. The imputed paid rent is also recorded under household final consumption expenditure (SNA93, §6.89).

The rental markets for durables are not necessarily as well organized as the rented housing market, and thus it is difficult to find prices for similar services. For this reason, the output of consumer durables is calculated as a user cost or rental price.[13] This is defined as the rate of return minus capital gain/loss plus depreciation:

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

where r is the user cost, p designates the price index for new capital goods, q is the net rate of return, π is the holding gain or loss, i.e. the change in prices from time $t-1$ to t and d is the rate of depreciation (Hall and Jorgenson, 1967; OECD, 2008). The subscript denoting asset type has been suppressed for economy of exposition. We used the ex-ante approach for rate of return, assuming that households expected a 4 percent real return, with no real asset price changes.[14] 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:

$$(3) \qquad cp\,YCD_t = r_r\,\overline{SCD_t}.$$

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

[13]Measuring the user cost of capital is deduced from the neoclassical theory of investment assuming equilibrium and ignoring uncertainty as well as adjustment costs. See Jorgenson *et al.* (2005).
[14]This implies that we set $q - \pi$ to equal 0.04.
[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.

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 (European System of Accounts (ESA95), §3.69). 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. Owing to this classification problem, this article 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.

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 (ESA95, §4.29). Therefore, car registration fees have to be added to taxes on production and deducted from other taxes payable.

As mentioned in 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 possible. For the EA, data are unavailable and, therefore, an aggregation of Member State data has been used. Direct data are obtainable for all countries apart from Germany and France, where car registration fees were estimated by using average registration fees per car for those countries for which the data was 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 as 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 consumption group. We took the 1975–2003 average shares in Finland

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[16]COICOP code 07.2.

TABLE 2

Depreciation Rates by Type of Consumer Durable

Code	Asset Type	Share of Asset Type Durable	Depreciation Rate	Source
C05.1	Furn. and furnish., carpets and oth. floor cov.	95.3%	0.1179	Fraumeni (1997)
C05.3	Household appliances	81.3%	0.1500	Fraumeni (1997)
C05.5	Tools and eq. for house and garden	39.2%	0.1650	Fraumeni (1997)
C06.1	Medical prod., appl. and eq.	35.9%	0.2750	Fraumeni (1997)
C07.1	Purchase of vehicles	100.0%	0.2720	Jorgenson and Stiroh (2000)
C08.1	Postal services	5.8%	0.1833	Fraumeni (1997)
C09.1	Audio-vis., photogr. and inform. proc. eq.	74.6%	0.1833	Fraumeni (1997)
C09.2	Oth. major dur. for recr. and culture	96.3%	0.1650	Fraumeni (1997)
C12.1	Personal care	2.8%	0.1650	Fraumeni (1997)
C12.3	Personal effects n.e.c.	51.4%	0.1500	Fraumeni (1997)

(see Table 2), and multiplied these shares with the national two-digit current price consumption expenditure figures of the other countries. 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 that the time series did extend as far as 1970 we used the volume of total consumer expenditure for each country to extrapolate 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:

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

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 2.

4. Results

In order to estimate the output of consumer durables at current prices, we calculated the user cost in Table A1, 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 A2). The major part of the output is consumption of fixed capital for the consumer durables.

In Table 3 can be seen the old household saving ratios. Table 4 presents the contribution of the capitalization of durables on household saving ratios. When comparing the levels of the old saving ratios with the new ones it is clear that the new ones are more similar than the old ones; their variance is smaller. The U.S. results vary between 1 and 3 percent, whereas our calculations show a lower impact in the

TABLE 3

TRADITIONAL HOUSEHOLD SAVING RATIOS, AS A PERCENT OF HOUSEHOLD DISPOSABLE INCOME,
1999–2003

	1999	2000	2001	2002	2003	1999–2003
Austria	8.76	8.44	7.47	7.67	8.57	8.18
Belgium	12.72	10.91	11.81	11.14	9.16	11.15
Germany	9.46	9.21	9.42	9.91	10.30	9.66
Spain	5.91	5.87	5.68	5.67	6.03	5.83
Finland	0.44	−1.25	−1.78	−1.01	−0.15	−0.75
France	12.00	11.91	12.67	13.84	12.86	12.66
Greece	5.81	4.60	3.40	2.14	2.16	3.62
Italy	9.77	9.19	10.22	10.39	10.60	10.03
Netherlands	9.62	6.78	9.70	8.66	8.46	8.64
Portugal	1.97	3.34	4.43	4.11	4.79	3.73
Euro Area	9.30	8.66	9.40	9.79	9.65	9.36

Notes: The euro area saving ratio presented is this table is not fully in line with one presented in table 3.4.3 of the *ECB Monthly Bulletin*. The saving ratio presented in this article has been calculated from the non-financial accounts' side as the saving ratio in the *ECB Monthly Bulletin* has been calculated from the financial accounts' side. As the euro area financial and non-financial accounts show a small discrepancy in the household sector, the saving ratios calculated from the two directions are also slightly different.

Source: Authors' calculations. Underlying data: Eurostat/ECB.

TABLE 4

CONTRIBUTION OF CAPITALIZATION OF DURABLES ON THE HOUSEHOLD SAVING RATIOS, PERCENTAGE
POINTS, 1999–2003

	1999	2000	2001	2002	2003	1999–2003
Austria	1.35	1.25	0.98	0.81	0.86	1.05
Belgium	1.10	1.35	0.92	0.54	0.72	0.93
Germany	0.89	0.73	0.90	0.47	0.22	0.64
Spain	2.95	2.06	1.70	0.95	0.95	1.72
Finland	1.94	1.91	1.19	1.62	2.57	1.85
France	1.23	1.22	1.19	0.96	0.72	1.06
Greece	2.23	0.92	0.98	1.11	1.18	1.28
Italy	1.65	1.60	1.10	0.80	0.63	1.16
Netherlands	2.57	2.55	1.80	1.63	0.98	1.91
Portugal	3.89	3.05	1.31	0.55	−0.56	1.65
Euro Area	1.49	1.36	1.13	0.76	0.54	1.06

Source: Authors' calculations. Underlying data: Eurostat/ECB.

euro area of 0.5 to 1.5 percent. However, the overall figures conceal considerable variation in individual Member States, with the effect in some countries such as Finland and the Netherlands close to 3 percent in some years and Portugal even over 3 percent.[17] It should be borne in mind that comparison of our results with the U.S.

[17]Sensitivity analysis using an exogenous, ex-post, net rate of return was performed. Three different categories of financial assets were used: 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. It did not markedly alter the results. We also used the 1 to 5 year consumer credit index (extrapolated from 2003 backwards with 1-year euribor); the impact on Euro Area saving ratios was insignificant as well. These computations are available from the authors by request.

estimates is not straightforward, because of methodological differences, such as the level of aggregation used in the calculations. The results are nevertheless similar.

Where the findings of this article also depart from Audenis *et al.* (2002) 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 article largely contradict this view. For instance, in Germany the effect varies between 0.2 and 0.9 percent with the durable goods' share of (uncorrected) disposable income between 10 and 11 percent, whereas in Finland the effect varies between 1.2 and 2.6 percent, although the durables' share of disposable income is almost the same as in Germany.

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, also impact the contribution of durables to saving ratios. This can be interpreted as not only the relative size of the capital stock having an effect on the saving ratio and disposable income but also the structure of the capital stock. Let us assume that two countries have relatively equal size capital stocks. The capital stock of one country consists of only cars and the other one consists of only fridges. The level effect of fridges and cars is the same but as fridges depreciate faster than cars the fridges have a stronger negative impact than the cars on the growth rates of saving ratios and disposable income. Furthermore, individual countries might have different depreciation rates for same goods and thus, identical capital stocks might have different effects in different countries.

In Germany and Austria, these factors seem 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. As can be seen in Table 5, the contribution of capitalization of durables on the growth rate of disposable income is negligible at the EA level. The strongest impacts are for Portugal, Spain, Finland and France. Averaged over the period 1999–2003 the effect on the level of disposable income of capitalizing durables varies between 1.4 and 2.3 percent of disposable income.

TABLE 5

CONTRIBUTION OF CAPITALIZATION OF DURABLES ON THE GROWTH
RATE AND THE LEVEL OF DISPOSABLE INCOME

	Growth Rate (%age points) 2000–03	Level (%) 1999–2003
Austria	−0.02	2.33
Belgium	0.01	1.65
Germany	−0.02	2.22
Spain	−0.13	1.64
Finland	0.08	1.90
France	−0.06	1.67
Greece	−0.02	1.35
Italy	−0.03	2.13
Netherlands	−0.04	2.13
Portugal	−0.18	1.99
Euro Area	−0.04	1.96

Source: Authors' calculations. Underlying data: Eurostat/ECB.

5. Conclusions

The purpose of this article was to estimate the impact of the capitalization 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 0.5 to 1.5 percentage points, in 1999–2003, when consumer durables are treated according to the current convention. The effect varies a lot between Member States from year to year and in some Member States capitalization affects as much as 3 percentage points of household saving in certain years. The level of EA disposable income is increased by 2 percent due to capitalizing durables. The impact on the growth rate of disposable income is insignificant. We furthermore found that the capitalization effect is not necessarily directly related to the share of expenditure on durable goods in income. Different depreciation rates for separate asset types also affect the contribution of durables to saving ratios.

This article is a first attempt to estimate the effect of capitalized consumer durables on household saving ratios and disposable income. The estimation includes a lot of assumptions, as detailed enough data are not directly available in international statistical databases. The ESA95 Transmission Programme of the European Commission includes only household consumption broken down by COICOP 2-digit level; which we have used in this article. There is a slight improvement in the new ESA95 Transmission Programme as it includes household consumption expenditures at the total level broken down by durability. However, if this level of detail were used in this analysis, it would force us to assume identical depreciation rates for all durable goods and thus, lead to biased estimates. Therefore, either detailed data broken down by COICOP which could be bridged by durability or preferably data cross-classified by durability and COICOP is needed. Several countries already make these calculations but the data should be collected in some international database in order to have it easily accessible for research.

What is the analytical meaning of this kind of exercise? Fiscal and especially monetary policy makers follow saving ratios. The Federal Open Market Committee[18] systematically refers to saving ratios in their statements and/or minutes. According to the economic analysis pillar of the ECB's monetary policy the Eurosystem uses a broad range of economic and financial indicators in order to assess the outlook for price developments and the risks to price stability (ECB, 2003). If households even partially interpret durable goods in their actual behavior as investments, we believe that the saving rates presented in this article provide a useful complementary picture on households' behavior. Thus, these kinds of alternative saving ratios could be used to aid policy decision-making. Whereas the SNA93 does not consider expenditure on consumer durables to increase future consumption possibilities in its core system, Jorgenson and Landefeld (2006), for example, provide other measures. Consumer durables could be both treated as assets and their services recorded in the national accounting framework, either in the actual core accounting system or in separate satellite accounts as proposed by the ISWGNA.

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[18]See: http://www.federalreserve.gov/FOMC/#calendars

APPENDIX

TABLE A1

USER COSTS OF CONSUMER DURABLES IN THE EURO AREA, 1999–2003

	1999	2000	2001	2002	2003	1999–2003
C05.1	16.6%	17.0%	17.2%	17.6%	17.9%	17.3%
C05.3	19.1%	19.2%	19.1%	19.2%	19.2%	19.2%
C05.5	20.7%	21.0%	21.1%	21.4%	21.8%	21.2%
C06.1	34.0%	34.2%	34.6%	33.8%	34.3%	34.2%
C07.1	31.5%	31.8%	32.1%	32.6%	33.0%	32.2%
C08.1	21.9%	20.5%	19.5%	19.0%	18.9%	20.0%
C09.1	18.5%	17.1%	16.2%	15.2%	14.3%	16.3%
C09.2	21.4%	21.9%	22.3%	22.9%	23.3%	22.4%
C12.1	21.6%	22.0%	22.4%	23.0%	23.7%	22.5%
C12.3	19.5%	19.7%	19.9%	20.4%	20.9%	20.1%

Source: Authors' calculations. Underlying data: Eurostat/ECB.

TABLE A2

OUTPUT OF CONSUMER DURABLES IN THE EURO AREA IN CURRENT PRICES IN MILLIONS OF EUROS, 1999–2003

	1999	2000	2001	2002	2003	1999–2003
C05.1	111,774	115,967	119,761	123,885	127,176	119,713
C05.3	31,617	32,805	33,859	35,150	36,272	33,941
C05.5	6,306	6,544	6,734	6,974	7,219	6,756
C06.1	19,499	20,363	21,266	21,531	22,619	21,055
C07.1	175,192	184,076	191,144	197,241	202,015	189,934
C08.1	3,259	3,398	3,658	3,996	4,365	3,735
C09.1	39,926	40,664	42,589	43,852	44,783	42,363
C09.2	10,021	10,583	11,150	11,835	12,313	11,181
C12.1	2,495	2,610	2,717	2,845	2,973	2,728
C12.3	24,453	25,180	26,012	26,891	27,585	26,024

Source: Authors' calculations. Underlying data: Eurostat/ECB.

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