



## Full Length Article

# How retirement changes consumption and household production of food: Lessons from German time-use data <sup>☆</sup>

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## ABSTRACT

In order to test whether a retirement-consumption puzzle does exist, we examine how food-related time use alters within the 50+ generation in Germany due to retirement. Based on the German Time-Use Survey, time-use patterns of retired and non-retired persons are compared statistically and determinants of time-use are elaborated by the use of double-hurdle and multiple regression models. With retirement, major changes take place in the food-related time use. Work-related food-away-from-home consumption is substituted by food production and consumption at home and associated shopping activities. Leisure-related away-from-home consumption gains importance for a portion of pensioners. These impacts are strong and highly significant for German households. By and large, there is no indication of a retirement-consumption puzzle but of a planned behavioral change in a new phase of life. Econometric analysis shows that other personal and sociodemographic variables explain food-related time use patterns in the 50+ generation, in particular gender, age, perceived health and the educational level attained.

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## Introduction

Constant or negative population growth rates in industrialized countries and a higher life expectancy have induced a demographic change in which the share of elderly persons has increased substantially. Thus, the economic behavior of the elderly has gained a rising interest over the last decade in macroeconomics, consumer economics, and agricultural and food economics. One particularly lively debate has been related to whether a retirement-consumption puzzle exists and how the empirical evidence can be explained.

Although broad empirical evidence has emerged from country studies (for surveys see [Hurst, 2008](#) and [Attanasio and Weber, 2010](#)), a comprehensive study of the implications of retirement for the consumption and household production of food is lacking. We intend to provide such an analysis with time-use data for Germany.

The retirement-consumption puzzle is closely related to the life-cycle theory of income and consumption ([Modigliani and](#)

[Brumberg, 1954](#); [Ando and Modigliani, 1963](#)) and the permanent-income theory of consumption ([Friedman, 1957](#)). According to basic versions of these theories, rational forward-looking consumers are expected to save at younger ages and to dissave at older ages in order to keep a constant utility level over the life-cycle. Doubts have been raised in theoretical and empirical analyses against this consumption-smoothing hypothesis. Firstly, [Hamer-mesh \(1984\)](#) argued that savings of consumers are too low to keep the level of consumption constant after retirement. Secondly, it was shown that income and consumption expenditures dropped with retirement in the USA ([Bernheim et al., 2001](#)), in the United Kingdom ([Banks et al., 1998](#); [Smith, 2006](#)), in Italy ([Battistin et al., 2009](#)), Japan ([Wakabayashi, 2008](#)), and Germany ([Lührmann, 2010](#)).

The existence of a retirement-consumption puzzle has been stated in the literature when the joint decline of consumption and income was not consistent with rational, forward-looking behavior in extended life-cycle models. [Banks et al. \(1998\)](#) argue along these lines and conclude that retirement cannot fully explain the fall in expenditures observed in the British Family Expenditure Survey. [Bernheim et al. \(2001\)](#) cannot reject a retirement-consumption puzzle, too, for their analysis of U.S. panel data. According to their analysis, households do not smooth the effects of predicted income changes in a “framework of rational, farsighted optimization” (*ibid.*, 2001, p. 855) but rather follow heuristic rules of thumb according to which they adjust their saving behavior at retirement.

Other authors challenge the existence of a retirement-consumption puzzle. Some take up the question whether retirees

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face anticipated or unanticipated declines of income and consumption. When contrasting U.S. information on expected changes in consumption at retirement with actual changes, [Hurd and Rohwedder \(2003, p. 17\)](#) find out that “consumption changes come as no surprise to most people” and spending changes are anticipated on average. The authors see “no reason to interpret the changes to a lack of forward-looking behavior” (*ibid.*, p. 17). [Wakabayashi \(2008\)](#) for Japan and [Haider and Stephens \(2007\)](#) for the U.S. reach similar conclusions. Haider and Stephens look at workers’ subjective beliefs about when they will retire and find that these expectations are “strong predictors” of actual retirement decisions. Survey results by [Ameriks et al. \(2007, p. 265\)](#) confirm “that many working households do expect a considerable fall in consumption when they retire”.

The empirical evidence further reveals that a disaggregation of consumption expenditures is crucial for a comprehensive assessment of linkages between ageing and consumption ([Aguiar and Hurst, 2013](#)). The influence of ageing differs markedly between foods and other nondurables such as entertainment. According to [Aguiar and Hurst \(2013\)](#), [Aguila et al. \(2011\)](#), food expenditures are one major expenditure category that declines after retirement whereas other expenditure categories for nondurable goods remain constant or even rise. One reason might be that expenditures for food away from home fall when leaving the labor force. Secondly, household-production theory suggests that pensioners will substitute market-related consumption of foods by home production as more time is available after retirement. Most likely, they will also spend more time on shopping and may thus be able to save on the purchase of commodities for home production of food. It may well be possible to keep a given level of utility from food consumption with lower food expenditures after retirement. Precisely this pattern has been found as a rational explanation of declining expenditures for food after retirement, for example, in the USA ([Aguiar and Hurst, 2005](#)), in Germany ([Lührmann, 2010](#)) and recently in Spain ([Luengo-Prado and Sanz, 2013](#)). For U.S. households, [Aguiar and Hurst \(2005\)](#) confirm a fall of food expenditures by 17% at retirement, but it is matched by a 53% increase in time spent on food production at home. Moreover, the time spent on shopping rises strongly and leads to a certain decline of unit values of grocery items after retirement. According to the authors, “neither the quality nor the quantity of food intake deteriorates with retirement status” ([Aguiar and Hurst, 2005, p. 919](#)). Thus, it is crucial to distinguish carefully between expenditures and consumption.

We are aware of four studies which deal with retirement-consumption linkages for Germany. [Schwerdt \(2005\)](#) and [Lührmann \(2010\)](#) address the retirement-consumption puzzle directly and deal with expenditures and home production around retirement for German households. Both authors agree that consumption expenditures fall and home production rises. Based on the German Income and Consumption Survey (Einkommens- und Verbrauchsstichprobe – EVS) between 1991/92 and 2001/02, [Lührmann \(2010, p. 241\)](#) finds “an expenditure drop of 17% of pre-retirement expenses on non-durable consumption in Germany” which is associated with an increase of time used for home production – by 89 min per day. She concludes that “households flexibly adapt to the change in time and money resources in retirement” ([Lührmann, 2010, pp. 241–242](#)).

Two other studies on Germany, by [Burzig and Herrmann \(2012\)](#) and [Drescher and Roosen \(2013\)](#), suggest that it matters to distinguish between the situations before and after retirement and those with and without retirement. In the before-and-after comparison, other variables like income, age and health may alter as well. The with-and-without comparison captures the pure retirement effect. [Burzig and Herrmann \(2012\)](#) explore how food-at-home and food-away-from-home expenditures of German households in

the generation 50+ are affected by income and socio-demographic factors, including age and retirement. Analyses with the ‘Survey of Health, Age and Retirement’ (SHARE) database reveal that per-capita expenditures for food consumption at home increase with retirement whereas the macroeconomic studies cited above measure a drop in consumption or food expenditures. The authors derive a pure retirement effect from the SHARE data by controlling for age and income. Rising food-at-home expenditures are consistent with a substitution of work-related food expenditures by home production, which will lead to more grocery purchases as inputs for higher food production at home. Many other sociodemographic variables including age, income and perceived health affect the pattern of food expenditures significantly, too. In applying cohort analysis, [Drescher and Roosen \(2013\)](#) analyze the determinants of German food expenditures per capita econometrically<sup>1</sup>. The authors argue that period and cohort effects may be as important as the age effects stressed in the life-cycle theory of consumption. For six years of the German Income and Consumption Survey, between 1978 and 2003, [Drescher and Roosen \(2013\)](#) elaborate significant age, period and cohort effects on food-at-home and food-away-from-home expenditures. Additionally, they identify significant impacts of the pensioner variable, gender, occupation, household composition and regions on the expenditure categories. [Drescher and Roosen](#) also derive a significantly positive impact of retirement on food-at-home expenditures.

In summary, the available literature on Germany shows that implications of retirement on consumption expenditures, food expenditures, and time use for home production have been analyzed. What is lacking is a detailed analysis of changes in all food-related time-use patterns due to retirement and a comprehensive analysis of determinants affecting food-related time use. We will provide such an analysis in the following sections:

- (i) We elaborate the time-use pattern of the German generation 50+ with regard to food production in the households, food consumption at home and away from home as well as shopping. Firstly, time-use patterns of retired and non-retired persons and households are compared statistically. Secondly, the implications of retirement on time-use are elaborated under *ceteris-paribus* conditions within multivariate analyses.
- (ii) Like [Lührmann \(2010\)](#), we utilize data from the German Time Use Surveys but with a different focus. Whereas [Lührmann](#) concentrated on aggregate time use for home production, we disaggregate time use for food production and consumption in the household, for food consumption away from home and shopping.
- (iii) Apart from the influence of retirement, we intend to explain food-related time use within the generation 50+ econometrically. We derive how other household characteristics and sociodemographic variables affect time use in order to draw general lessons on food consumption behavior of the German elderly.

The article is organized as follows. After this introduction and literature review, we explain the data in Section 2 and provide statistical evidence on how food-related time-use alters with retirement. In Section 3, the methodology of a multivariate analysis of the determinants of time use for food production, food consumption at home and away from home, and for shopping is explained and quantitative results from double-hurdle and multiple regression models are presented. In Section 4, we discuss these

<sup>1</sup> Similar studies are available in which consumption and food expenditures of households have been analysed by use of cohort analysis: for Canada by [Denton et al. \(1999\)](#), for Japan at the product level by [Mori et al. \(2000\)](#) and for the U.S. by [Blisard \(2001\)](#).

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