Population Ageing and Consumption Demand in Belgium

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Abstract

This paper analyzes the effect of population ageing on consumptions aggregates in Belgium. Since consumption expenditures change markedly over the life-cycle, the structure of aggregate consumption is likely to change in the course of population ageing. First, we estimate the effect of age on expenditures for 10 composite goods coming from household's surveys. This is done using a pseudo-panel method. Second, age-specific profiles are used to forecast composition of consumption until 2050. The results point to increases in health, housing and leisure expenditures and decreases in equipment, clothing and transport expenditures. These changes are relatively moderate but non negligible. They will translate in sectoral shifts and most probably in changes in sectoral employment.

Keywords: Consumption, demographic ageing, projections.
JEL classifications: D12, E21, J21.

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1. Introduction

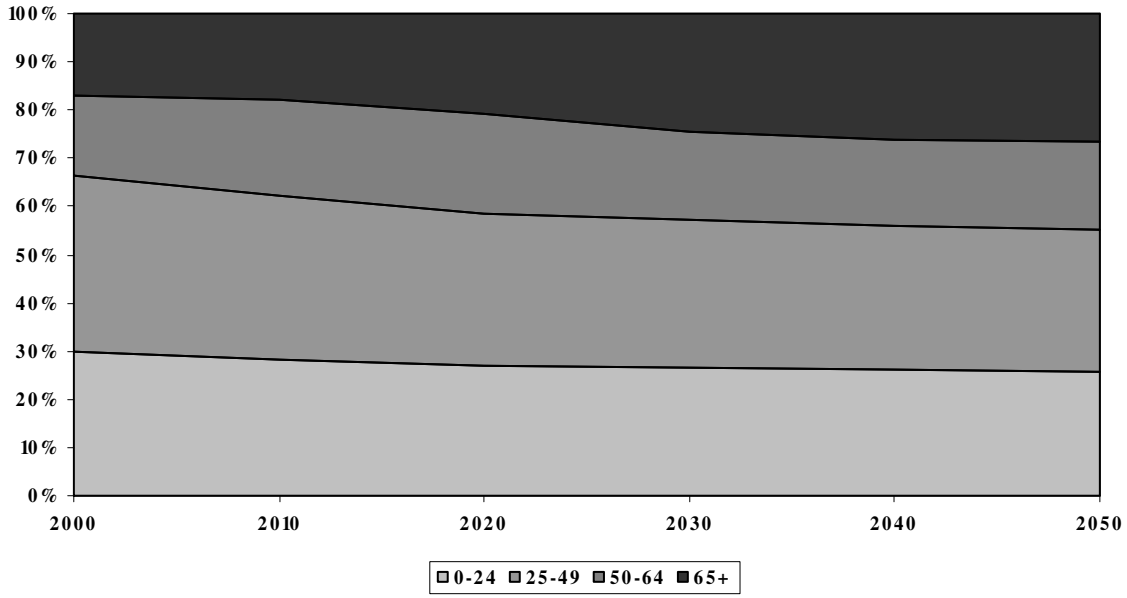
Like other industrialized countries, Belgium is facing a major demographic challenge. The age structure of its population is projected to change considerably in the first half of this century. For the last fifty years, the proportion of people aged between 20 and 64 remained stable whereas the proportion of younger has dropped. In 1950, 30 percent of the population was younger than 20 and 11 percent was older than 65. In 2000, these shares were 25 percent and 17 percent respectively. The projections of population confirm this evolution, see Figure 1. By the year 2050 we may expect that the number of people in Belgium over the age of 65 will make up 26 percent of the population (Mestdagh and Lambrechts, 2003).

A lot of economic issues surround this phenomenon of ageing population. First of all, it will have profound effect on the size and composition of the labour force. The ramifications for the economy depend on how both labour supply and labour demand respond to this structural change in the working population. Concerning savings, as the baby-boomers reach retirement they will begin to draw down on investments made to support themselves. At the same time reduction in the size of the labour force may result in lower levels of savings. As a result we may expect changes to capital markets. Thus even if economic growth depends on a range of factors, population ageing may affect economic growth through its potential effects on savings, investments, the stock of capital and labour (Stephenson and Scobie, 2002). A more important policy issue is concerned with the future sustainability of the social security system. As the elderly are in a large extent supported through social spending, its financing will become problematic. There is, however, a high degree of uncertainty surrounding the future path of demand for public resources but some expenditures will invariably expand as a result of population ageing. Maintaining the system would require to increase taxation or completely modify it. This could breakdown political consensus around the financing of pension system for example.

In this paper, we focus on the consumption behaviour of households at the later age. In the course of the ageing process, elderly households will play an increasing role but their behaviour might differ substantially from that of working people. As a consequence, if they represent a bigger and bigger part of the population (see Figure 1), this process might involve changes in the household's consumption structure and the economy might have to face a significant change in the national demand structure. In turn, such changes are likely to trigger substantial sectoral shifts. Furthermore, sectoral employment is closely linked to sectoral

production, so that demand changes may finally affect sectoral employment. If employment adjustment is low (due to a lack of mobility for example), adjustment of production to demand changes might be difficult. In addition, such demand changes will also affect other areas of the economy. Thus predicting long-term demographic trends on demand is important. The purpose of this paper is to investigate these effects on the consumption demand at a macroeconomic level through projections of the future aggregate consumption structure.

Figure 1 : Population by age, 2000-2050



Source : Mestdagh and Lambrechts (2003)

A number of studies have looked to consumption at older ages, especially at retirement (Hammermesh (1984), Fair and Dominguez (1991) Banks, Blundell and Tanner (1998) Bernheim, Skinner and Weinberg (2001) Hurd and Rohwedder (2003)). The finding of all these studies is that consumption falls significantly at retirement. This fall is commonly known as the "retirement-consumption puzzle". However, a simple one-good model of life-cycle consumption would require a consumption smoothing; this means that consumption by an individual should be continuous in time. Banks, Blundell and Tanner (1998) argued that it is the marginal utility of consumption instead of consumption itself that is smoothed and then changes in family size, number of workers, mortality or aging may alter this marginal utility and lead to an optimal fall in consumption in the later ages. Bernheim, Skinner and Weinberg (2001) also find a decrease of consumption after retirement and argue that it is due to a lack of forward-looking behaviour by households. Retirees would face fewer resources than anticipated and should accordingly reduce consumption. Hurd and Rohwedder (2003) and Smith (2004) suggest that the fall in spending can be explained by a substitution effect

between consumption and increased leisure time. Other explanations to this fall would be the end of work-related expenses and better purchases made by retirees thanks to their leisure time.

The goal of this paper is twofold. First, we estimate econometrically the effect of age on various expenditures coming from household budget surveys. This breaks away from the papers listed above. We look at the profile of consumption at a (much) more disaggregated level and try to see which expenditures increase or decrease according to the age. Bodier (1999) using French expenditures surveys, finds that it exists specific consumption according to the age. For example, the young people are expected to consume more equipment and the elderly are expected to consume more leisure, health care or private services.

Once obtained, the consumption profiles are used with demographic projections to predict the aggregate Belgian consumption structure given the expected age-structure change in the future. These predicted changes in the aggregate demand are computed with a simple mechanical method o projection and give a pure demographic effect.

The rest of the paper is organized as follows: The next section presents the econometric method and the data used to evaluate the effect of age on consumption. Section 3 presents the results obtained with these estimates. In Section 4, the profiles obtained in Section 3 are used to make forecasts about the change of the structure of household's expenditures given the demographic boom of older people. Section 5 concludes (and summarizes the main ideas of this paper).

2. A time series of cross sections

Life-cycle consumption profiles would ideally be studied with panel data, where the same people are tracked over time. Unfortunately such data do not exist in Belgium. There are only several large household budget surveys. If the information contained in the surveys is comparable, samples are drawn anew each year so that it is impossible to track individual households over time as it would be with panel data. But in the absence of such data, a time-series of cross-sectional surveys can be used[1]. The method exposed by Deaton (1985) in his seminal paper proposes to use these successive cross-section surveys to track cohorts of households and set up a so-called pseudo-panel (or synthetic panel).

[1] Empirical research has stressed the fact that panel data are not indispensable for the identification of many estimated models and that the parameters of interest can often be identified from a series of cross-sections (Verbeek, 1992)

Therefore identifying criteria defining cohorts in each survey will generate successive random samples of individuals from each of the cohorts. Summary statistics (average values of each cohort) from these random samples generate a time series that can be used to infer behavioural relationships for the cohort as a whole just as if panel data were available[2]. Four our purpose, we identify cohort by the date of birth and the level of education. That is a cohort is defined by the date of birth of the head of the household on a 5-year period and by the end of studies diploma: primary and inferior secondary, upper secondary and College.

2.1. Age, generation and time effects

The identification of age, generation and time effects is an important issue in this undertaking. The aim is to isolate within the cohort data the age effect whatever the cohort the household belongs. But cohorts are defined among surveys that take place at different dates and the economic, social and institutional environments are then each time different. Furthermore several generations coexist at the same time; a same event will probably affect differently the behaviour of each generation since they are at a different stage of their life-cycle. Consumption has obviously a strong life-cycle age-related component, but if the profiles themselves move upward over time with economic growth, for example, tracking different cohorts allows us to disentangle the generational from the life-cycle effect. It is crucial to identify within our cohort data the age effects, year effects and generation effects.

Different solutions are proposed in the literature and we decide to express one of the three effects mentioned above by auxiliary variables that summarize its action. In this respect, we try to see what characterizes the effect of date. Which modification in the general context has had an impact on consuming behaviour of every households whatever their generation or their age. As the income is the principal explanatory variable of consumption, we use it as a proxy of the date. We know that the standard of living of the older people is improving so it seems reasonable to use this variable as an indicator of the household's environment at each date[3]

2.2. The model

[2] This kind of method is formulated as a response to the absence of panel data but does not offer inferior results. It has basically two advantages compared with panel data. First it avoids the attrition problem that many panels suffer from and then avoids the risk of becoming increasingly unrepresentative over time. With cohort data, a new sample is drawn every year, representativeness is constantly maintained. Second, there may be less bias due to measurement error problems because we are typically working with a cohort average.

[3] It would be interesting to take into account the potential change in the consumers' preferences due to fashion for example. Nevertheless it is difficult to assess and out of our purpose within this work.

To be more explicit, we can now expose how we are going to estimate the consumption function. Starting from a basic problem of consumption demand, consider a simple linear model with fixed unobserved effects:

$$\log C_{iht} = \alpha_i + \beta_i \log W_{ht} + \sum_{j=1} \gamma_{ij} a_{jht} + \theta_{ih} + \varepsilon_{iht} \qquad (1)$$

Where C_{iht} is the quantity of good *i* purchased by household *h* at time *t*, W_{ht} is the total income of the household *h* at time *t*, a_{jht} is a vector of socio-economic and demographic characteristics, α, β and γ are parameters, θ_{ih} represent individual fixed effects, ε_{iht} is the error term.

Practically we face a basic linear unobserved effects model where the effects (θ_{ih}) are supposed to be fixed, which means that one is allowing for arbitrary correlation between them and the others observed explanatory variables[4]. Consider that each household *h* is a member of exactly one cohort *c* that can be tracked through successive surveys, this cohort *c* being defined previously by its generation (date of birth of the head) and by the level of education. Considering a cohort *c* at time *t*, we can aggregate over the *h* belonging to cohort *c* and then taking simple population means of cohorts:

$$\log C^*_{it} = \alpha_i + \beta_i \log W^*_{ct} + \sum_{j=1} \gamma_{ij} a^*_{jct} + \theta^*_{ic} + \varepsilon^*_{ict} \qquad (2)$$

Where $\log C^*_{it}$ is the average value of all observed $\log C_{iht}$ in cohort *c* at time *t*, and analogously for the other variables in the model. The resulting data set is a pseudo-panel with repeated observations over *t* periods and *c* cohorts. As we do not work with true panel data but with cross-sections different at each time, θ^*_{ic} is not really constant over time. But if at each date, we have a certain number of households belonging to the cohort *c*, we can assume that θ^*_{ic} is a good proxy of θ_c [5]. Let us add that to take into account the heterogeneity that

[4] $E(\theta_{ih} | W_{ht}, a_{jht})$ can be any function of explanatory variables

[5] The same is true for the parameters of the model. The real point is about the number of observations within a cohort and the number of cohorts. If we have enough households in each cohort (around 100) and a certain number of cohorts, we can reasonably ignore the measurement errors and use these means as the true ones and then compute the standard within estimator (Verbeek and Nijman, 1992).

exists among households in terms of composition, all monetary variables are expressed in equivalence scale before being aggregated into cohorts mean[6].

At final, we estimate:

$$\log C_{it}^{*} = \alpha_i + \beta_i \log W_{ct}^{*} + \delta_i Z_{ct} + \sum_{j=1} \mu_{ij} A_{jct} + \sum_{c=1} \xi_{ic} D_c + \varepsilon_{ict}^{*} \qquad (3)$$

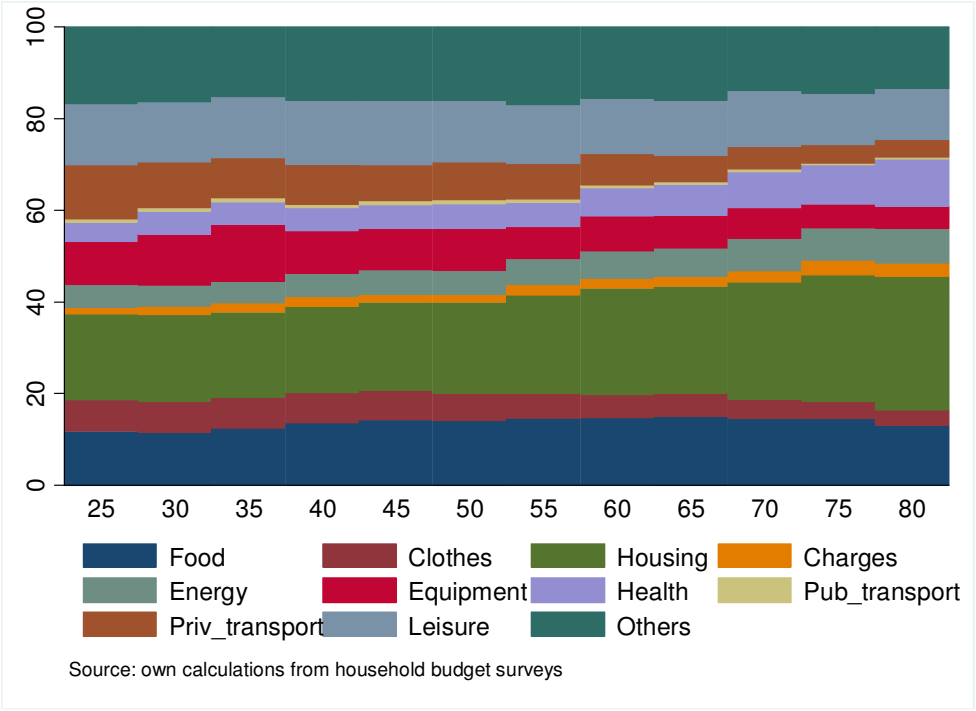
Where Z_{ct} is a vector of demographic factors that may change through time. We take here the size of the household expressed by the average number of people. A_{jct} is a dummy that denotes the age of the head of the household. It is this variable that allows us to capture the age effect. In each cohort, at each date, we use the average age of the head as a reference for that cohort. D_c is a dummy variable indicating whether the head of the household belongs to the cohort *c*.

2.3. The data

The data come from the Belgian Household Budget Survey. It is a national representative survey that questions people about incomes and expenditures. The measurement concept is the household, consequently we do not have individual data but the use of equivalence scale allows us to approximate it. These Households Budget Surveys have been lead on a regular interval (between 7-8 years for the first two waves) and are available on an annual basis since 1995. Six waves are used (1979, 1988, 1996, 1997, 1999 and 2000) and we retain only households whom the head is between 25 and 85 years old. Before 25, many people are not yet in proper household, they are not really representative of their generation and after 85, there are not enough households represented in the surveys to properly build the pseudo-panel.The surveys contain detailed monetary information on household's expenditures. We aggregate them into 11 composite goods: Food, Private Transport, Public Transport, Clothes, Energy, Equipment, Housing, Charges, Health, Leisure and a residual good. In addition a set of socioeconomic variables is available.

[6]The equivalence scale used in our approach is the one proposed by the OECD, it gives a weight of 1 to the head of the household, 0.7 to each adult (defined as age 18 and older) and 0.5 to each child (under the age of 18), respectively.

Figure 2 : Share of each demand in total consumption (%) over 1979-2000 by age



Source: own calculations from household budget surveys

We have 16376 observations for six years and we aggregate it according to our cohort definition. First, according to the date of birth, we have 15 different cohorts from "1895-1899" to "1969-1974". Second, according to the level of education, we triple the number of cohort. It gives 231 cells representing on average the behaviour of 92 households. It is near the 100 households needed to correctly estimate the model and we could reasonably accept the results from our estimation. Defining cohorts on the sole date of birth and having much more households in each cell does not give different results.

Figure 2 depicts the allocation of total consumption expenditures on the eleven goods by age over the period 1979-2000. It shows that the share of food stays roughly constant between 25 and 40 years old and increases thereafter. Young households spend an increasing share of their expenditures on household's equipment up to age of 35. This expenditure remains constant until age 50 and decreases thereafter. Health expenditures gain an increasing weight in total spending from age 55 onwards. Its share roughly doubles between 55 and 80. A very similar pattern can be seen for energy, charges and housing expenditure shares. The expenditure shares of transports and clothing, on contrary are highest at young ages and strongly decline after age 60. However, Figure 2 does not enable us to distinguish the sources of differences: age, year and generation. Thus, it only serves as a descriptive starting point for the analysis. The age-specific demand profile is presented in the next section using a fixed-effect model.

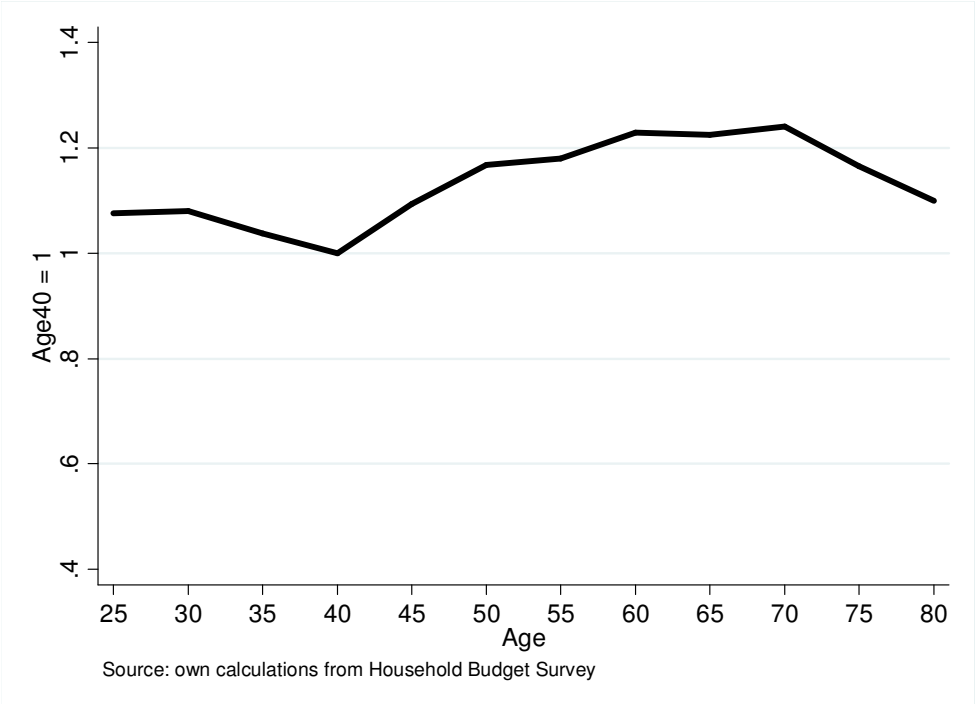
3. The consumption profiles

The regression results are presented on Table 1. The Figures 3 to 5 give the profiles of consumption by age. For each profile, the reference situation is the average consumption of households aged 40 (to 44) and is set to 1.

3.1. Total demand

First, we present the total consumption. We see on Figure 3 that it increases slightly from 40 until 70 and then begins to decrease. This is quite contradictory with the general life cycle theory which predicts a hump-shaped profile. This can be explained by the use of equivalence scales that take into account the household composition. If we control for the composition of household, it is normal to have an increase of total expenditure when children are leaving the household as well as a decrease when the household enlarges. This explains why we obtain a decrease of consumption until 40 and an increase afterwards. Cardoso and Gardes (1996) find a similar result using a pseudo-panel of surveys from France. When they represent total expenditure by units of consumption, the traditional hump-shaped curve is replaced by a much more smoothly curve similar to the Figure 3. There are other effects than the life-cycle to explain the evolution of consumption: income effect, cohort effect, cyclical effect, heterogeneity of households and accounting for changes in household composition might substantially alter the movement of consumption over the life-cycle.

Figure 3 : Total consumption demand by age



Source: own calculations from Household Budget Survey

Tableau 1 : Regression results

	Total	Food	Clothes	Housing	Charges	Energy	Health	Private transport	Public transport	Leisure	Equipment
Log *W*	0.642***	0.205***	0.455***	0.508***	0.213***	0.412***	0.373***	0.358	0.205	1.084*	1.426***
Size	-0.032*	0.157***	0.352***	-0.248***	-0.277***	-0.084**	-0.428***	0.489**	-0.177	-0.216***	-0.289
Age25-29	0.073**	0.079	0.209	-0.231***	-0.142***	-0.128	-0.329***	0.651***	-0.316	-0.207***	-0.221***
Age30-34	0.077*	0.017	0.209*	-0.183***	0.072***	-0.094	-0.111***	0.362**	-0.250	-0.216***	-0.353***
Age35-39	0.038**	0.048	0.052	-0.100***	-0.213***	-0.046	-0.155***	0.233	-0.324*	-0.148***	-0.076**
Age40-44	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Age45-49	0.090**	0.101**	-0.114	0.011	0.004	0.057	0.074	-0.054	-0.033	0.171***	0.317
Age50-54	0.155***	0.063	-0.215*	0.027**	0.023**	0.092	0.234***	0.011	0.106	0.281***	0.697**
Age55-59	0.165***	0.079*	-0.469***	0.011***	0.169***	0.171**	0.309***	0.005	-0.169	0.261***	1.051***
Age60-64	0.206***	0.033	-0.450***	0.004***	0.385***	0.245***	0.436***	-0.154	-0.219	0.486***	1.282***
Age65-69	0.203***	0.044	-0.699***	0.026***	0.445***	0.366***	0.521***	0.232	-0.538**	0.529***	1.902***
Age70-74	0.215***	0.005	-0.878***	0.098***	0.546***	0.331***	0.421***	-0.220	-0.518**	0.646***	1.902***
Age75-79	0.153***	-0.114**	-1.134***	0.111***	0.389***	0.347***	0.512***	-0.345	-0.799***	0.577***	1.867***
Age80-84	0.095***	-0.236***	-1.422***	0.101**	0.366***	0.324***	0.388***	-0.934***	-0.794***	0.378***	1.769***

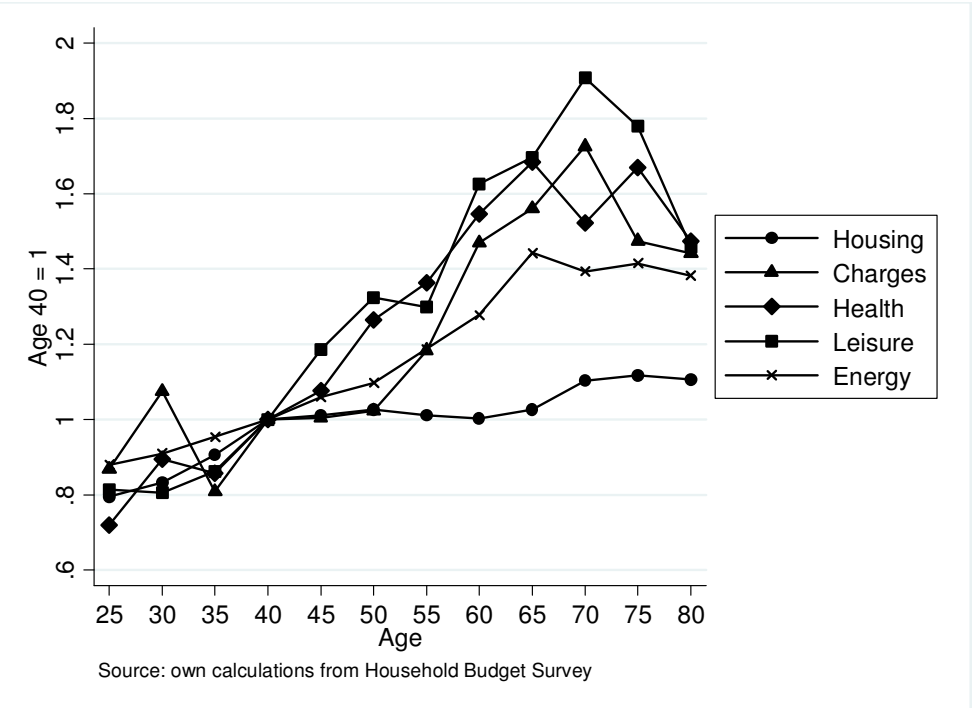
3.2. Increasing demands

Although the evidence presented does not suggest a significant change in total consumption at the latter age, it does not exclude the possibility of changes in the composition of consumption. On Figure 4, we find the profiles for a few consumptions expenditures that increase with.

About the expenditures in the domestic area, Figure 4 displays an increase of expenditures for housing with age. At the end of the life cycle, individuals live probably in too large accommodation with respect to their needs. It is in general the house or the flat in which they have lived most of their life with children. In consequence, the charges associated with the maintenance of the housing also increase as we are going further in life, representing at 80 an increase of 40% with 40 (see appendix).

The expenditures on heating and electricity are increasing considerably with age too. One can put forward the same argument as before: a too big house for one-person household that lead to too big expenditures with respect to the size of the household. There is also an isolation phenomenon. Autonomy is decreasing with age and health degradation. Once retired, it appears that people stay more often at their home so that heating and lighting charges naturally increase.

Figure 4 : Expenditures that increase with age



Source: own calculations from Household Budget Survey

Health expenditures are supposed to increase with age. The profile of health displays well a significant increase of expenditure according to age. Following the same cohort, we have expenditure at 80that are 40% higher than at 40. It is clear also that this increase is also related to a supply effect due to the more and more diversified supply of health care services and intervention. It is also sure that elderly consult more and face many more health problems than younger. However, there is a cultural factor that makes each new generation consulting more physicians than the previous one.

Leisure is also a good point to illustrate the difference when we take the effect of cohort into account. Usually leisure appears to be a consumption that is rather young in cross-section studies. But in a certain way, this is quite contradictory; people would reduce considerably their leisure activity at a moment of their life when they have much more free time to enjoy it. Isolating the effect of age from the generation is again important. If we follow households from a same cohort, we have a clear age effect, the maximum of consumption appears at 70 and along the life the leisure has taken a more and more extent. Even if it decreases after 70, it still stays higher than it was at 40.

3.3 Decreasing demands

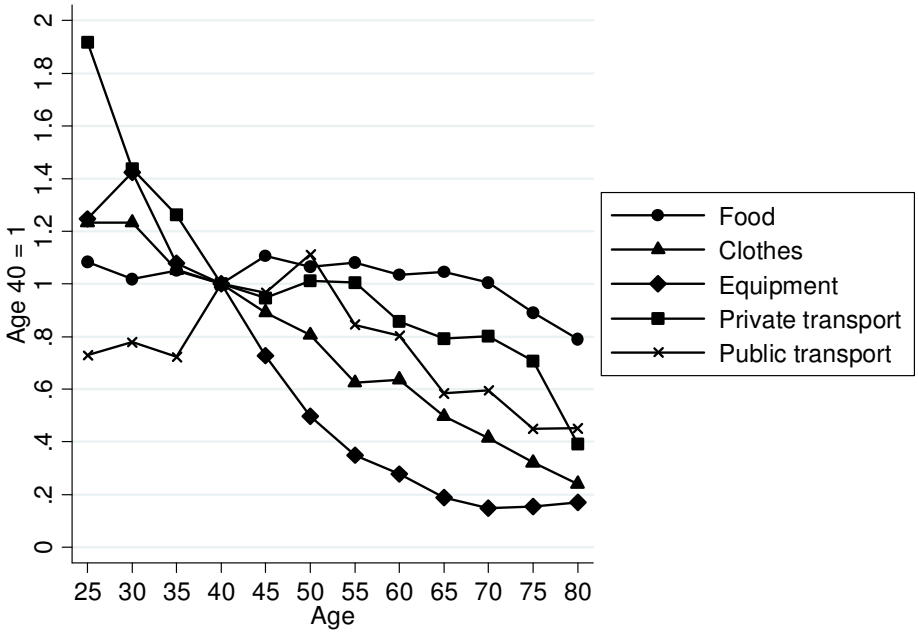
On Figure 5, decreasing profiles are shown. The private transport expenditure is composed of all the expenditures associated with the ownership of a vehicle: purchase, maintenance, insurance. We see a quick decrease of transport expenditures. The consumption of the youngest appears to be enormous compared to what it is at 40. This may be due to the household's composition. When the household is stable in terms of its composition, the expenditures are also stable. The private transport expenditures decline significantly after 70 to represent 40% of the expenditures of 40 at 80. There are two reasons to this sharp decline at older ages. First it is observed that the ownership of a car does not systematically diminish with the age. But with the end of working time, households own one car instead of two. Second, if there is a decrease in ownership, it is probably linked to the diminution of mobility of the elderly in general.

The public transport expenditures do not have the same path as private transport expenditures. The profile exhibits a maximum at 50, so public transport is neither a young consumption nor an older one. The difference between this maximum and the level at 25 is about 40% and is about 70% with the 80. The very small amount dedicated to public transport by the older can be attributed to the small mobility due to the age.

On Figure 5, the food consumption is also presented. While food is reputed being middle age consumption, it appears to be quite stable and shows a decrease of consumption for elderly after 70. The decline on longitudinal profile is probably due to a decrease of the needs of elderly. An isolation effect plays probably a role too. Elderly have fewer relatives, see fewer people and in consequence invite fewer people too.

The cost of clothing decreases considerably with age. This can be interpreted as the end of spending associated to work which reduce markedly their clothing's expenditures. The house's equipment expenditures present a sharp decrease along the life-cycle. Before 30, young households are often tenants and then do not spend too much to set up their home. From 30, households spend more to fit out their house with furniture and durables. Once these huge purchases done, expenditures are mainly to renew worn equipment and are done less often. This renewal is probably done less and less as households become older which explains the quick decrease at older age. At 30, the expenditures represent 142 % of the 40 and at 70, it represent only 15 %.

Figure 5 : Expenditures that decrease with age



Source: own calculations from Household Budget Survey

4. Projections of future demand

In this section, we use estimates from the previous section to project changes in the consumption composition induced by population ageing. As said in the introduction, by the year 2050, the Belgian population will have to face with an increasingly share of elderly. If the structure of individual consumption is affected by ageing, the potential growth rate would be attested trough the change in aggregate saving and sectoral shifts induced by the changes in the structure of consumption.

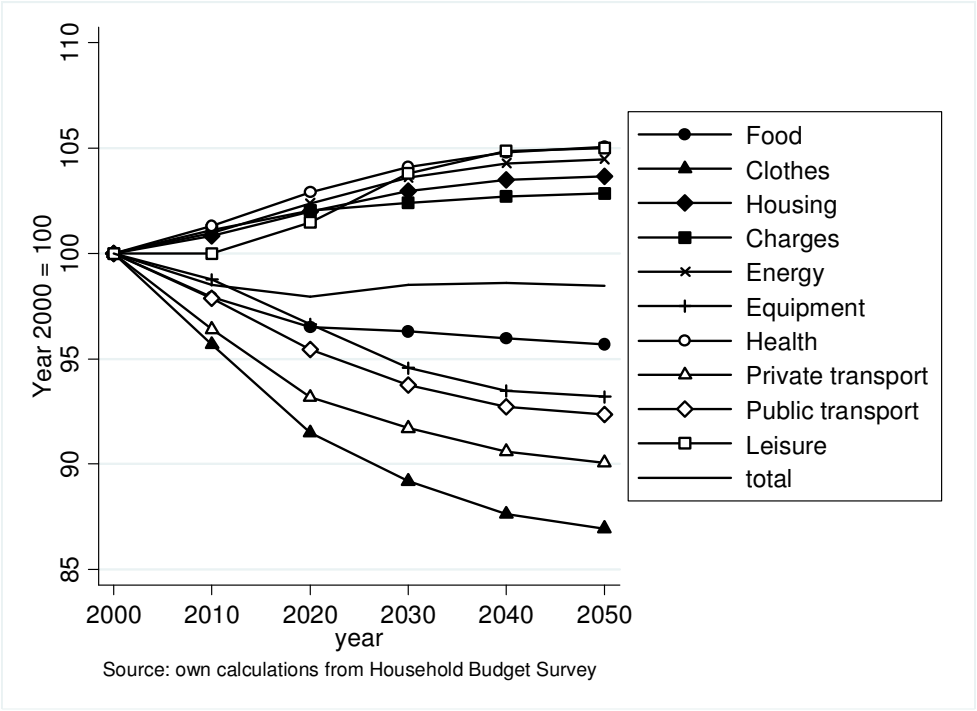
In the previous section, it has been found that consumption differs among ages but that this life-cycle pattern does not necessarily induce a decrease of consumption at older ages. Given that, we might expect a considerable change in the aggregate consumption structure. To check this intuition, we use demographic projections to make out-of-sample-predictions of the changes in the aggregate demand structure over time.

We approach the projection task in a simple scenario that neglects all supply side effects, that is we assume that supply is perfectly price-elastic. It is not true at short term but taking a very long term, it is not clear whether the relative prices will react to the demographically induced demand changes and in which direction they will change. This will depend on the evolution of technical progress and other factors. We use a simple baseline case where we assume that all household characteristics remain at the base year level of 2000. This is a rather restrictive assumption but it allows isolating the direct effect of population ageing on consumption demand without any accompanying effect. Using the structure of population estimated by the Belgian National Institute of Statistics (NIS), we know the total population at each age E_t^a for each date. The average consumption (C_t) of the entire population at a date *t* is then given by:

$$C_t = \frac{\sum_a C_t^a E_t^a}{\sum_a E_t^a} \qquad (4)$$

By applying this formula to the projected population by age and using the profile of consumption of 2000 as a baseline for C_t^a, we quantify easily the impact of demographic change on the different demands. As shown in the previous section, some expenses increase or decrease following the age, we then expect that ageing makes bigger the first and smaller the second.

Figure 6 : The effect of ageing on consumption



Source: own calculations from Household Budget Survey

Figure 6 presents forecast for aggregate household's expenditures for the period ending in 2050 (see table A-2 in appendix for details). The forecasts using the NIS population projection show that the declining population proportion in the younger age groups, matched with increasing proportions in the over 65s age group, will lead to a slight decline in total consumption. This decline will arise in the first twenty years of the period and consumption should remain stable afterward. Figure 6 presents also the forecasts of the consumption expenditures by broad categories of good and services. The results show that population ageing alone would lead to an increase of the expenditure of health of about 6 per cent until 2050, and raises the expenditures of housing (in general) and leisure substantially.

All other expenditures (transports, equipment, food and clothes) would decrease. These results are mostly due to the fact that in 2050, the age group under 40 years will have a low weight in the aggregate demand, while people above 65 years will form a large fraction of the population. However, at the same time, the age group between 40 and 65 years will still represent a large group.

The pattern of health is surprising since we would expect health expenditures to increase even more with ageing. However one has to bear in mind that health demand, in this case, includes only out-of-pocket health expenditures. These may represent a small amount of the actual expenditure because health costs are cover to a large extent by public spending and health insurance and are thus not measured here. The Belgian Federal Planning Bureau (2004)

estimates that the total health expenditure by households, State and firms should exhibit an annual growth rate of 3.3% for the period 2003-2030 while the public health expenditure should increase at an annual growth of 2.%. However, these estimates are not very far from what we obtained.

However, despite the large demographic shocks, changes in projected consumption are relatively moderate at most +6% /-13% changes to compare, for example, with the doubling of health expenditures in many OECD countries the past 30 years. These effects are obviously non negligible but are below the growth of annual per capita expenses observed in general.

Nevertheless, our approach is partial and does not take into account the possible answers of the economy. In general equilibrium model, these effects could be even smallest. The endogeneity of relative prices seems to moderate these effects instead of intensify them.

Finally it should be stressed that these results depend on the strong assumption that the behaviour and the propensities to consume on the various items will remain at their 2000 levels. However, if participation in the labour force of elderly were to increase, their consumption profile could change and come closer to those of prime-age people for example.

5. Conclusion

In the first part of this paper, we find that there exist age effects in the consumption composition. In the course of the life cycle, households change the structure of their consumption. Health, leisure and housing expenditures become more important components of the total consumption when people become older. There would be young specific consumption and elderly specific consumption.

These age effects translate into aggregate demand changes for the composite goods over time in the second part of the paper. These changes are substantial but manageable. Especially, equipment, transport and clothing become a less important factor in total spending, while leisure and health show clear upward trends in the aggregate demand. These results indicate future changes in sectoral production as well as on labour market.

Let's say that this approach is only partial and that if the taken assumptions allow isolating the pure demographic effect of ageing, they are not innocent. Family formation, preferences changes, the timing of entry into the labour force and other life cycle decisions underlie possible changes over time.

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Appendix

Tableau A-1: Consumption by age compared to the 40-44 years

	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84
Total consumption	1.07	1.08	1.04	1	1.09	1.17	1.18	1.23	1.22	1.24	1.16	1.10
Private transport	1.91	1.43	1.26	1	0.94	1.01	1.01	0.86	0.79	0.80	0.71	0.39
Public transport	0.73	0.78	0.72	1	0.967	1.11	0.85	0.80	0.58	0.59	0.45	0.46
Food	1.08	1.02	1.05	1	1.11	1.07	1.08	1.03	1.05	1.01	0.89	0.79
Clothes	1.23	1.23	1.05	1	0.89	0.81	0.62	0.64	0.49	0.41	0.32	0.24
Equipment	1.24	1.42	1.08	1	0.73	0.50	0.35	0.28	0.19	0.15	0.16	0.17
Housing	0.79	0.83	0.91	1	1.01	1.03	1.01	1.01	1.03	1.10	1.012	1.11
Charges	0.87	1.07	0.81	1	1.01	1.02	1.18	1.47	1.56	1.73	1.47	1.44
Energy	0.88	0.91	0.95	1	1.06	1.09	1.18	1.27	1.44	1.39	1.41	1.38
Health	0.72	0.89	0.86	1	1.08	1.26	1.36	1.55	1.68	1.52	1.67	1.47
Leisure	0.81	0.80	0.86	1	1.18	1.32	1.30	1.62	1.69	1.90	1.78	1.46

Tableau A-2: Variation of consumption components, 2000-2050

	2000	2010	2020	2030	2040	2050
Total consumption	100	99	98	99	99	98
Private transport	100	96	93	92	91	90
Public transport	100	98	95	94	93	92
Food	100	98	96	96	96	96
Clothes	100	96	91	89	88	87
Equipment	100	99	97	95	93	93
Housing	100	101	102	103	103	104
Charges	100	101	102	102	103	103
Energy	100	101	102	104	104	104
Health	100	101	103	104	105	106
Leisure	100	100	101	104	105	105