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Financing the Consumption of the Young and Old in France

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Introduction

A BETTER UNDERSTANDING of the resource allocation across ages is fundamental to put in place welfare reforms in the context of population ageing. In times of major demographic change, the redistribution of resources between age groups and the funding of the economically inactive aged remains a recurring topic of public debate and a major public policy concern in OECD countries. Governments search for a policy mix that will improve the quality of life of the elderly, while at the same time investing in the future of the young and reducing the fiscal burden on the working population. Life expectancy and education requirements are increasing while budget constraints are tightening. This potentially creates tension in the allocation of resources between age groups (Preston 1984; Lee and Mason 2011a). Some authors have shown the negative impact that a growing share of elderly could have on education spending for the young (Poterba 1997, 1998; Harris et al. 2001). The compact between the generations could suffer as a result (United Nations 2013a; Chen et al. 2018).

With their contribution to the financing of consumption by the young and the elderly, governments influence the distribution of resources between generations. Policy action in this field therefore plays a crucial role for intergenerational equity. However, the family also plays a major role in intergenerational transfers. Consumption expenditure that is not covered by the State and the family is financed by the individuals themselves. In most developed countries, responsibilities between the State, individuals, and the family are shared but the weighting is quite different across countries, and weights have varied significantly over time within countries. How

the funding of private and public consumption at different ages is shared between the State, individuals, and the family reveals the relative importance of these institutions in a society.

By applying the methodology of National Transfer Accounts (NTA), this article analyzes for France (1) how the funding of consumption (public and private) is secured at each age; (2) how the funding of consumption has changed over recent decades; and (3) how the consumption is financed compared to that of other countries (China, Germany, Japan, Sweden, United Kingdom, and United States). We consider three sources for financing consumption: the State (net transfers and in-kind services), individuals themselves (income and assets), and families (*inter vivos* transfers, excluding bequests, following the NTA methodology) (United Nations 2013b).

To do so, we have built a database that includes age-profiles for 87 variables from the French National Accounts, covering the period 1979–2011. This unique database contains 281,184 observations. Data on total consumption and on funding of the individual, the State, and the family is made available on the French NTA website.¹

Our work adds to other country-specific studies that have already used the NTA method for analyzing how consumption is funded at different ages.² Studies that have used the NTA method for developed countries converge in finding that over the last three decades the general level of consumption, which is a standard indicator of welfare, has continuously increased across all ages, while at different rates.³ With our analysis of the contribution of the State, the family, and the individual to the financing of private and public consumption by age, we contribute to addressing the question whether governments reinforce or counterbalance generational inequalities in consumption.

Our analysis of the different sources of funding reveals that, while consumption increases were more important for the elderly than for the young over the 1979–2011 period in France, the elderly were not favored by the State. The consumption of the elderly did not result from a larger share in public transfers; rather, the elderly were more autonomous and increasingly financed their consumption by their own means. On the other hand, the consumption of the young was increasingly funded by public means, especially for two age groups: the very young, who received more generous family benefits; and those aged 18–24, who benefited from higher public investment in education. Longer educational enrollment thus reduced the relative private consumption of the young but increased their relative public consumption. Besides, the young increasingly benefit not only from public financing, but also from family transfers, while the elderly increasingly finance themselves.

Our international comparison reveals that public funding of the elderly remained significant in France. Nevertheless, this was not at the expense of the young. Even if the Baby Boom cohorts in France may increasingly

put pressure on public budgets due to their high numbers and increasing life expectancy, public per capita expenditure for the elderly has kept pace with that for younger individuals, while elderly consumption levels have increased.

Measuring intergenerational transfers with NTA

Context

The first researchers who incorporated demographic change (changes in population size and age structure) into macroeconomic modelling were Allais (1947) and Samuelson (1958). They pioneered the overlapping generations model (OLG), where the economy is seen through the lens of several generations, making it possible to take into account intergenerational transfers. Diamond (1965) then incorporated capital into the model and concluded that public and intergenerational transfers may increase welfare and contribute to consumption optimality. This approach was complemented by the life-cycle theory of Modigliani and Brumberg (1954) who argued that individual savings influence national savings and enable exchanges between generations. Lee (1980, 1994) then developed a more comprehensive life-cycle model which includes aggregate consumption, savings, transfers, and government debt while accounting for birth and survival rates. On the empirical side, the method of generational accounting was developed first by Auerbach et al. (1992). To assess fiscal policy's redistributive and savings effects on each generation's financial receipts and obligations, the method incorporates generations' present expected value of lifetime net payments to the government into public deficit, debt, and fiscal policy. The generational accounting method initially focused on public transfers, leaving out an important aspect of intergenerational transfers resulting from the family (Masson 2002) and the eventual interactions between these and public transfers. To overcome this, the allocation of economic resources between ages must be quantified in a unified and comprehensive manner. The NTA method meets this challenge and was successively applied to build Full Generational Accounts that incorporate private transfers (Lee et al. 2017). Another limit in generational accounting is its static approach, which implies that individual reactions to changes in fiscal policy, for example in terms of labor supply and savings, cannot be observed (Haveman 1994). Developing NTA over a long period of time should thus help to estimate present expected values of lifetime net payments without relying on necessarily sensitive assumptions. Finally, the generational accounting method does not say much on welfare (Kotlikoff 1995; Diamond 1996). We believe that the simple measure of living standard that is given by consumption can nevertheless be understood as a first approximation

of aggregate welfare, supposing that private and public consumption are perfect substitutes.

The aim of the NTA method is to disaggregate income, consumption, and savings by age and therefore to take into account intergenerational transfers made by the State or the family (Mason et al. 2009; Lee and Mason 2011b). NTA is today a well-established empirical tool for understanding the generational economy, with harmonized data available for just under 50 countries (United Nations 2013b).

The NTA method

The NTA method is based on an accounting equation whereby private and public resources and consumption are set equal. An individual's resources, income from labor and capital plus public and private transfer inflows must be equal to the use made of them, whether for consuming, saving, or making public and private transfers. Consumption and production levels are then calculated for each age, both individually and in aggregate. Transfers between ages reallocate the wealth produced during the active ages so that individuals can consume at various times in their lives. There are ages when they consume but do not produce—childhood and retirement—and other ages when they produce significantly more than they consume: adulthood.

More specifically, NTA is based on an age-specific flow identity capturing economic flows at each point in time. Variables are indexed by (a), which denotes the age of an individual. This flow identity is similar to a budget constraint for individuals of age a , as seen in life-cycle models. It can be written as follows by traditionally grouping the inflows (left-hand side of the equation) and the outflows (right-hand side):

$$Y^L(a) + Y^K(a) + T^{G+}(a) + T^{F+}(a) = C(a) + S(a) + T^{G-}(a) + T^{F-}(a) \quad (1)$$

where Y^L is the value of labor income inflow received for age (or age group) a , Y^K is the asset income inflow (that includes net property incomes), T^G is the flow of public transfers, received as denoted by (+) and spent as denoted by (−), T^F is the flow of family transfers also received and spent, C is consumption and, finally, S stands for savings resulting as the residual left between the various types of income net of consumption. These variables capture at the same time flows that are domestic and international.

The life-cycle deficit is a key concept of the generational economy. It is the difference between consumption and labor income for every relevant age (or age group), where consumption includes households' public and private consumption of various goods and services, including public and private education and healthcare for example, and where labor income includes employees' earnings with fringe benefits, as well as self-employment and unpaid family workers' incomes. The flow identity, given by

equation (1), can thus be re-arranged to reveal how the economic life-cycle deficit (or surplus) is funded by (or distributed through) asset-based reallocations (i.e. asset incomes minus savings) and net transfers:

$$C(a) - Y^L(a) = Y^K(a) - S(a) + T^{G+}(a) - T^{G-}(a) + T^{F+}(a) - T^{F-}(a) \quad (2)$$

In this article, we have decomposed consumption according to our three main sources of funding, namely the individual, the State, and the family. To do so, we have split savings into public savings, denoted S^G , and private savings, denoted S^F . We also have split asset income into public asset income, Y^{KG} , and private asset income, Y^{KF} . We obtain:

$$C(a) = [Y^L(a) + Y^{KF}(a) - S^F(a)] + [T^{G+}(a) - T^{G-}(a) + Y^{KG}(a) - S^G(a)] + [T^{F+}(a) - T^{F-}(a)] \quad (3)$$

The first term refers to individual funding, (labor and capital income minus private savings), the second to State funding (net payments by the State), and the third to net family transfers.

Construction of aggregates and individual profiles by age

The profiles by age are constructed so as to be consistent with National Accounts (NA). Aggregates are constructed in two steps: First, we construct various mean profiles by age and smooth them. Second, we fit these profiles to the corresponding NA aggregates (d'Albis et al. 2015). Appendix A (online) provides more details on the method applied to construct of aggregates and shows numbers of the aggregates (public transfers, labor income, private assets, etc.) in France from 1979 to 2001.

The NTA method is based on constructing individual profiles of the financing of consumption by age from survey questionnaires and public statistical data. Appendix B (online) provides an overview of the different French data sources we used to construct the individual age-specific profiles.

The age profiles of public transfer in-kind inflows were presented in detail in recent work on the life-cycle deficit (d'Albis et al. 2015). Most age profiles for public transfer cash inflows are known at the individual level from family budget surveys (unemployment benefits, retirement payments, etc.).⁴

One exception is family benefits, which are only known at the household level. Taxes, employees' contributions and employers' contributions are also mostly observed at the household level in the surveys. This is also the case for asset income as well as private transfer inflows and outflows between households. For these inflows and outflows that are observed at the household level, consistent allocation keys had to be found in order to individualize them within households. Appendix C (online) provides more

information about the particular allocation keys we developed in order to obtain individual age-specific profiles for these items which are only observed on a household basis in the French surveys.

Income from public assets and public savings are allocated according to the profiles of compulsory contributions, using the NTA Manual methodology (United Nations 2013b).

The labor income profiles by age are determined from household survey data that include information on individual salaries. The age profile for salaries is obtained by calculating for each age the mean salary of all survey respondents of that age, with the salaries of non-working respondents set at zero.⁵ A similar methodology is applied for employers' social contributions and the income of the self-employed. Intra-household transfers to fund consumption and per capita savings are calculated from individual bases using all the previously calculated variables. Appendix D (online) details the method for calculating intra-household cash transfers.

Funding of consumption at each age: the role of the State, the family, and the individual

The left column of Figure 1 shows the three funding sources (the State, the family, and the individual) of per capita consumption provided at each age. These are net values, which correspond to inflows received by the individual minus outflows paid by the individual. To ease the comparisons over the period considered, the per capita value of each component is divided by the per capita labor income of individuals aged 30–49.⁶

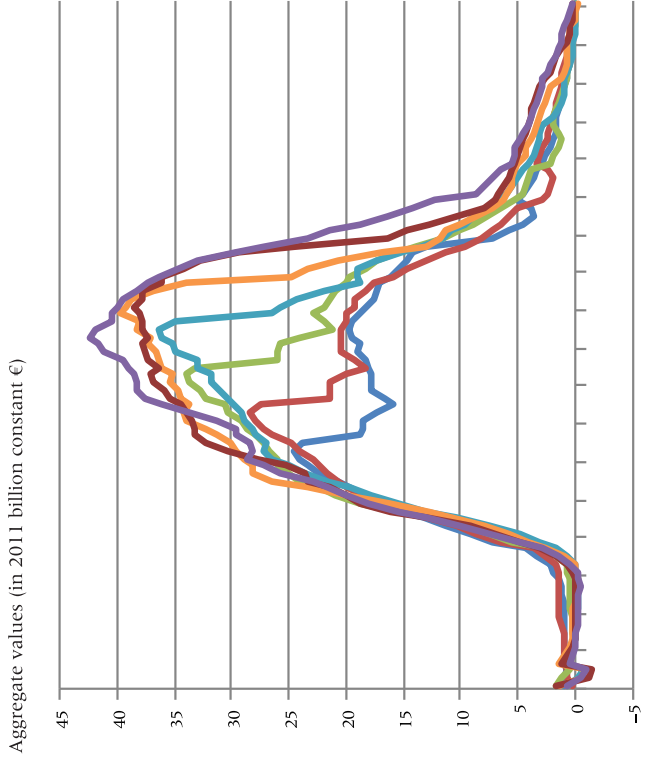
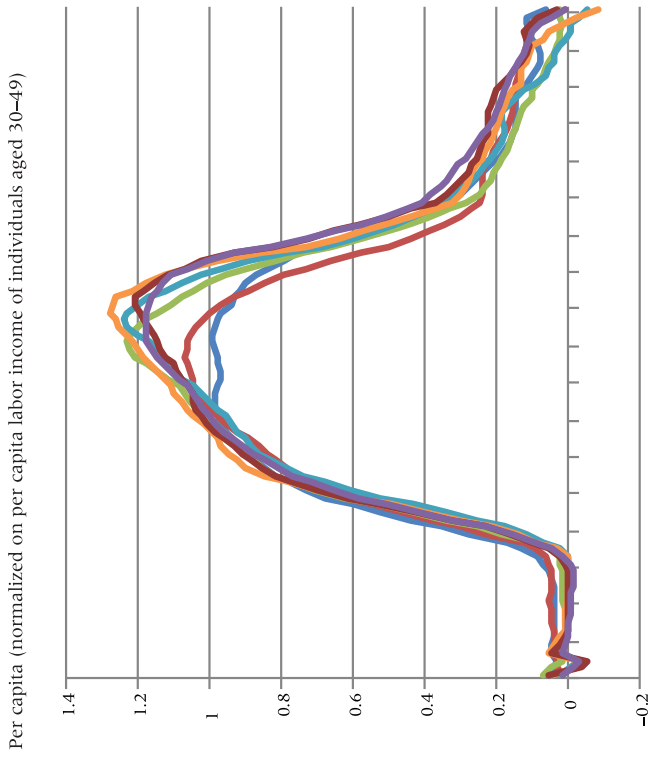
The right column of Figure 1 shows the aggregate values of the three components in constant 2011 euros (€), which are thus the product of the individual profiles and the population age distribution. The different years (1979–2011) correspond to the different waves of the “*Budget de familles*” surveys that we used to compile these data.

The main trend we observe is a shift to the right between 1979 and 2011 for the individual funding of consumption (labor- and asset-based income), which can be seen both in the left and the right column. This trend can be explained by two phenomena:

The first concerns the narrowing of the working-age period under the double effect of postponing of age of entry into the labor market and the diminishing age of exit. Over the period, the age of entry into the labor market increased with the rise of educational attainment⁷ and the increasing difficulties of non-educated young people to enter the labor market: between 1975 and 2015, the unemployment rate of individuals aged 20–24 years increased fourfold in France. The retirement age decreased in the beginning of the observed period, especially following the 1982 reform that allowed for a decrease in the normal retirement age from 65 to 60. However, since

FIGURE 1 Funding sources for consumption—France 1979–2011

(a) Individual funding

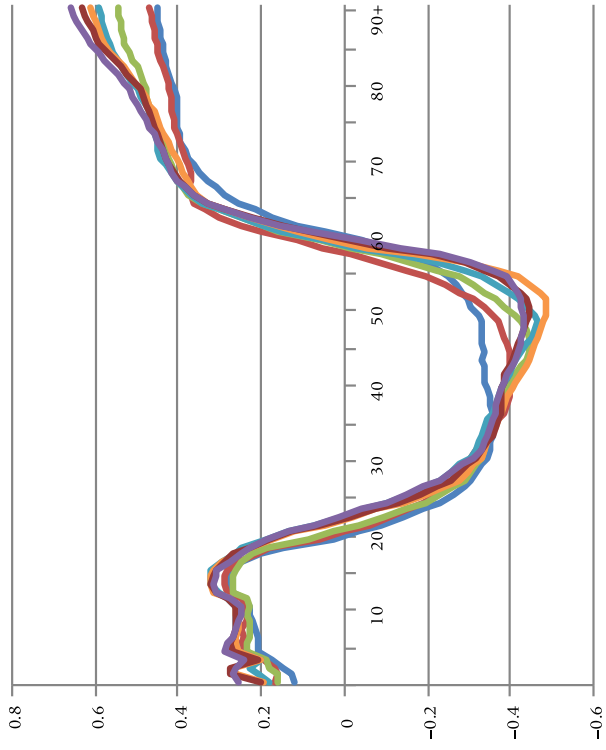


Legend for Figure 1:
1979 (blue line), 1984 (red line), 1989 (green line), 1995 (teal line), 2000 (orange line), 2005 (dark red line), 2011 (purple line)

FIGURE 1 (continued)

(b) State funding

Per capita (normalized on per capita labor income of individuals aged 30–49)



Aggregate values (in 2011 billion constant €)

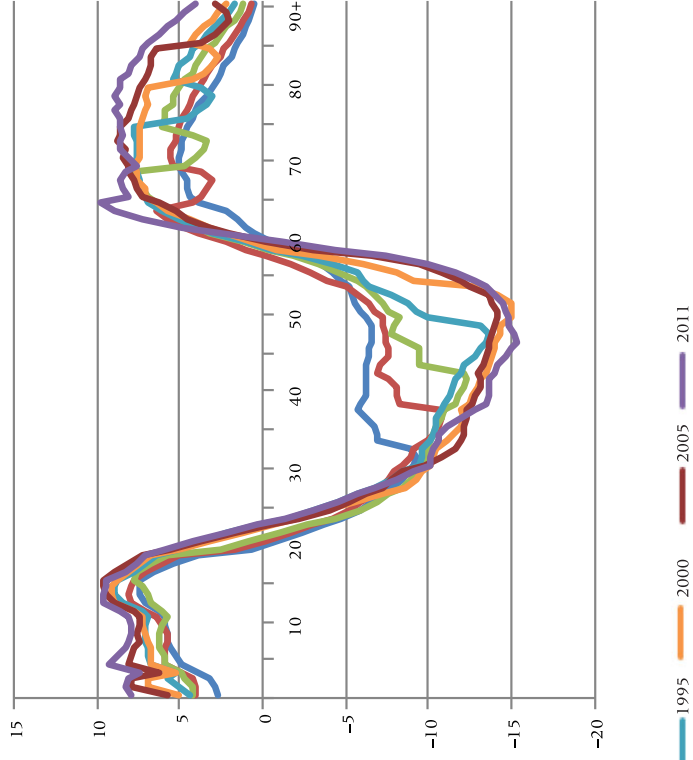
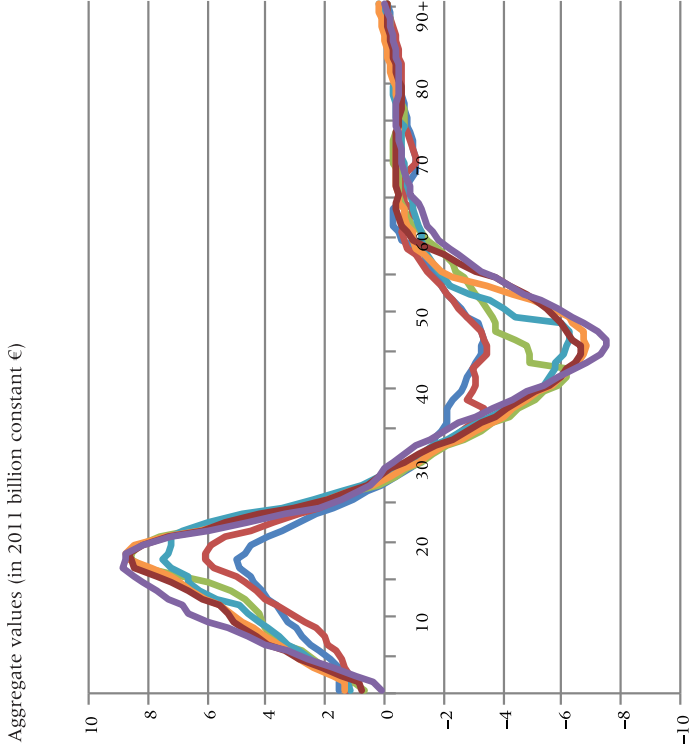


FIGURE 1 (continued)

(c) Family funding

Per capita (normalized on per capita labor income of individuals aged 30–49)



SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Echantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

the mid-1990s, different reforms were implemented in France to ensure the long-term sustainability of the pension system. In particular, the required contribution period to receive a full pension regularly increased over the period, inducing a postponement of retirement age.

The second concerns the shift to the right of the modal age of the profile of individual funding of consumption by age. This change can mostly be explained by a change in the labor income profiles (d'Albis et al. 2017). However, private asset income net of private savings also plays an increasingly important role in France, especially after age 60, where it represented 64 percent of the individual source of funding in 2011.

Increasing per capita income combined with the demographic weight of Baby Boomers resulted in a strong effect on the aggregate values of individual funding of consumption by age, as illustrated in the right column of Figure 1. Baby Boomers generated high amounts of resources which were transferred directly to non-working age groups or indirectly through the public transfer system. In 1995, the Baby Boomer cohorts born between 1945 and 1965 constituted the heart of the working age population. At this time, among the age groups that generated net transfers (for which the flow of transfers spent is higher than the flow of transfers received), the Baby Boomers generated 75 percent of the public transfers and 72 percent of the private transfers to the non-working age groups. However, the first baby boom generations are now starting to retire and they are now contributing less to the transfer system.

The young benefited the most from the significant private transfers made by individuals of working age. However, when it comes to State funding of consumption, the per capita net public transfers over the observed years did not only increase for the young, but also for the elderly. In 1979, net public transfers of individuals aged 0–24 accounted only for 14 percent of the labor income earned by individuals aged 30–49, while in 2011, they reached 22 percent.⁸ For the elderly, we observe also a net upward flow of public resources from 1979 to 2011. In 2011, the average net public transfers of individuals aged 60+ represented 42 percent of the labor income earned by individuals aged 30–49, whereas it accounted for only 34 percent in 1979. The effect is even stronger for individuals aged 75+. The indicator for this age group was 42 percent in 1979 and reached 56 percent in 2011.

We can conclude that the increase of public transfers to the elderly did not occur at the expense of the young in France, but rather that both age groups benefited from more and more generous State funding. The young also benefited from increasing family transfers, which come especially from the groups at working age: while the elderly generate less and less private transfers to the young, the working age population increase their private transfers to the young over the years.

TABLE 1 First and last age for which individual resources (labor income and asset income) are higher than total consumption

	1979	1984	1989	1995	2000	2005	2011
First age to which $C(a) < (Y^L(a) + Y^K(a) - S(a))$	22	23	23	25	24	24	24
Last age to which $C(a) < (Y^L(a) + Y^K(a) - S(a))$	59	57	59	59	59	59	59

SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

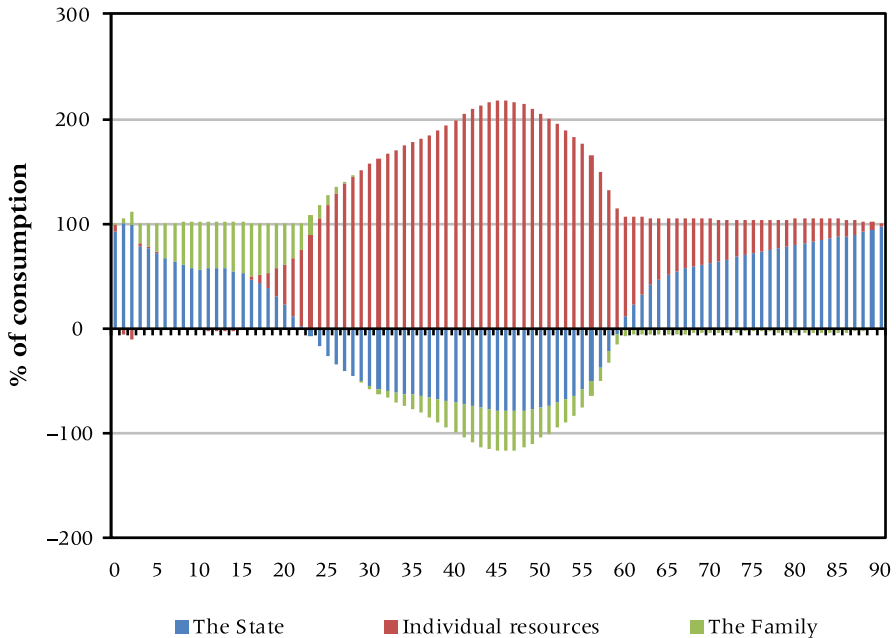
Funding the consumption of inactive age groups

The relative weight of individual funding, State funding, and family funding of consumption can be measured separately for the periods of economic inactivity during youth and old age. The 0–24 and 60+ age groups have been used for the two periods outside working age for every year from 1979 to 2011. These ages correspond to the earliest and latest ages when individual funding is greater than total consumption (since the year 2000, see Table 1).

Young individuals are less independent in financial terms

Figure 2 shows that in 2011, the State's role in funding consumption during youth (ages 0–24) gradually decreased with age, while private transfers increased between ages 0 and 16, and individual funding commenced between ages 16 and 24. In 2011, public transfers declined with age from 93 percent of consumption at birth to –18 percent at age 24. Private transfers rose from 1 percent at birth to 50 percent at age 16 and then fell continuously until age 24. Individual funding was 3 percent at age 16 and 105 percent at age 24.

Figure 3 shows that the main change in the financing of young people's consumption between 1979 and 2011 was an increase in the State's contribution and a decrease in individual funding. In the 1979–1995 period in particular, there was a significant reduction in individual funding, from 38 percent to 19 percent, and a steady increase in State funding from 32 percent to 45 percent. In 1979 and 1984, the financing of young people's consumption was relatively evenly balanced between the State, the individual, and private transfers. The State supported 32 percent of this consumption in 1979 and 36 percent in 1984, the individual 38 percent and 34 percent, and private transfers 30 percent in both years. Subsequently, the State share rose and the individual's share fell.⁹ In 2011, the State funded 45 percent of young people's consumption, the individual 19 percent, and private transfers 36 percent (34 percent transfers within households, from parents to children, and 2 percent transfers between households). The increase in the

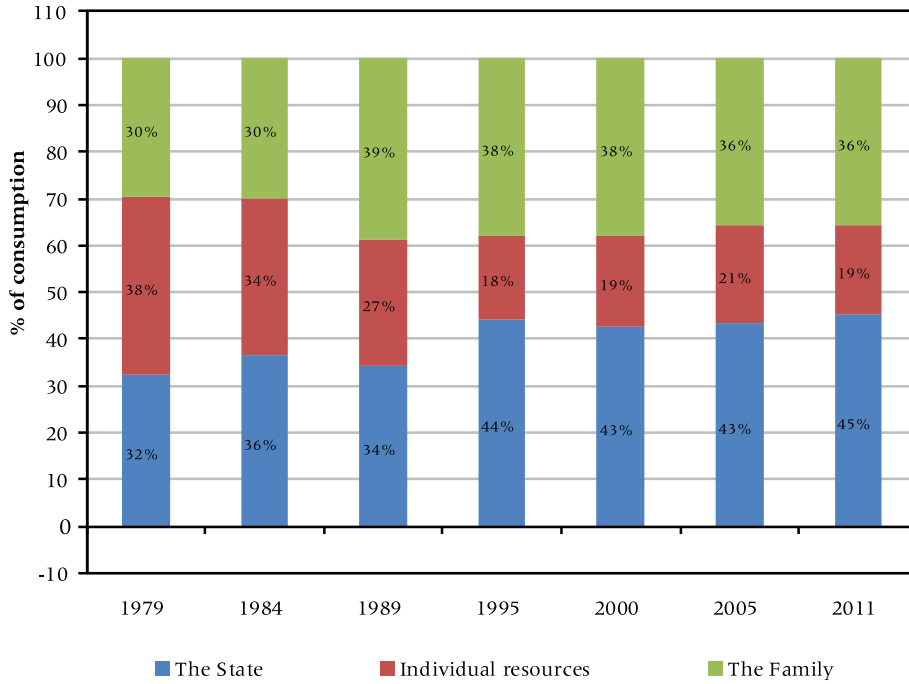
FIGURE 2 Funding sources of consumption—France, 2011

SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

percentage of State-financed consumption of the young between 1979 and 2011 is mainly due to the rise in school enrollment and higher education expenditure per capita, reflecting the government's investment in human capital, but it is also due to the increase in family benefits and a decrease in taxes paid by youth. In 2011, education accounted for 37.4 percent of public transfers received by individuals from the government. In-kind transfers allocated equally across ages accounted for 27.7 percent of public transfer inflows and finally, family benefits accounted for 19.5 percent of public transfer inflows for the age group 0–24.

The increase in the State's share of funding young people's consumption is most striking for the infant 0–3 age group. For these children, the State's share rose between 1979 and 2011 from 56.3 percent to 91.8 percent, while private transfers fell from 27.5 percent to a mere 9.1 percent. This increase in public transfers is mainly due to family benefits, which rose from 24 percent of infant consumption in 1979 to 50.8 percent in 2011.¹⁰ This increase reflects a generous family policy,¹¹ the effects of which are recognized for maintaining fertility at one of the highest levels in Europe (around replacement level) while enabling women to remain in the labor market (Luci-Greulich and Thévenon 2013).

FIGURE 3 Funding sources for consumption before the age of 25—France, 1979–2011

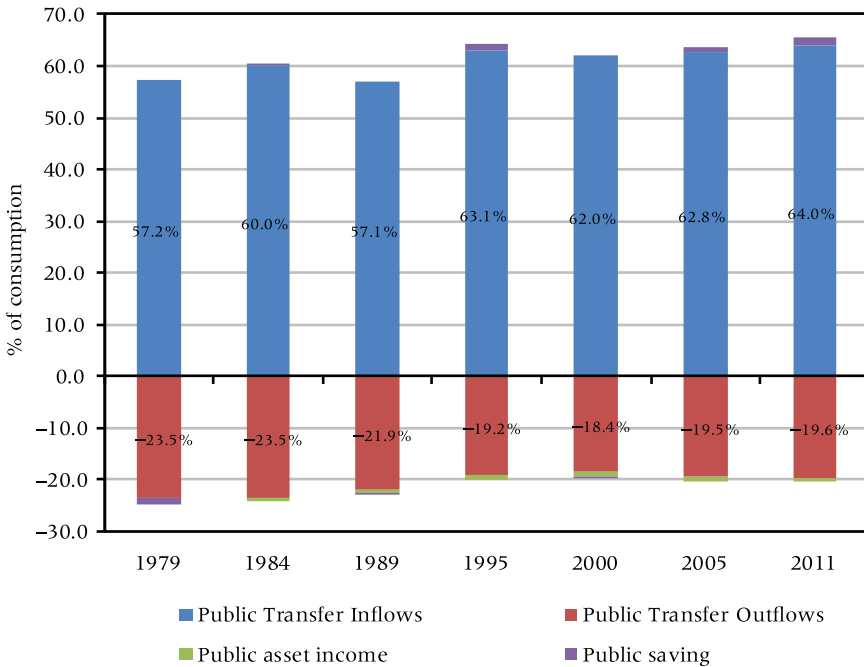


SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

This increase in public funding of 0 to 3 year-old children does not, however, lead to the same extent to an increase in total consumption of children aged 0–3. Certainly, the value of family benefits increased steadily over the period from €5,283 in 1979 to €17,583 in 2011 (constant 2011 €), with an average annual increase of 3.8 percent over the observed 32 years. However, the consumption of children aged 0–3 has only increased from €21,990 to €34,615 (constant 2011 €) over the period, which represents an average annual increase of only 1.4 percent, as family benefits have crowded out private family transfers after 2000. Indeed, private transfers for children aged 0–3 decreased by 2 percent annually over the period from €6,054 in 1979 to €3,156 in 2011 (they actually increased by 0.6 percent annually between 1979 and 2000, but decreased by 6.7 percent annually between 2000 and 2011).

According to the NTA decomposition, State funding consists of public transfer inflows and outflows, and public asset-based reallocation, made up of income from public assets and public savings. The increase in the

FIGURE 4 Sources of public funding for consumption before the age of 25—France, 1979–2011



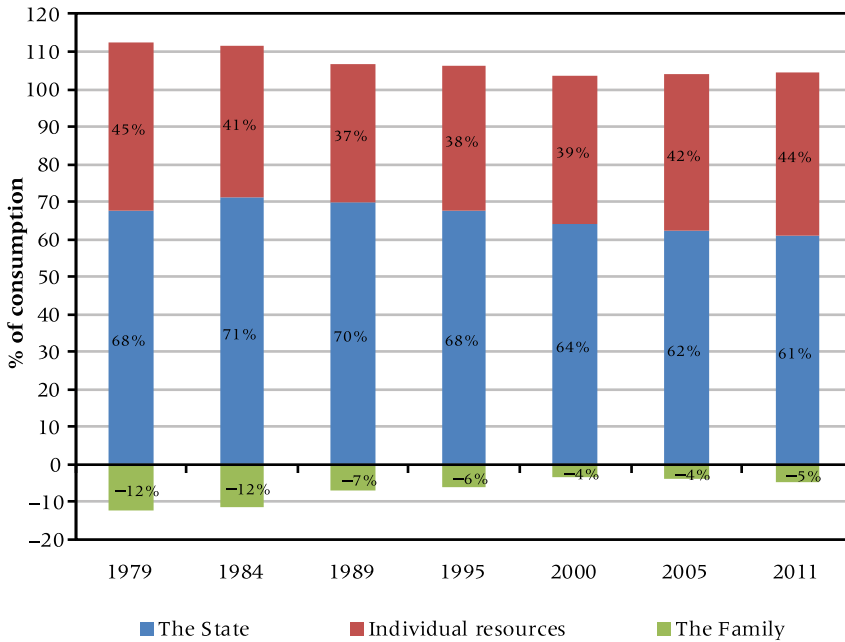
SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

State's share of the funding of young people's consumption is associated with changes in both public transfer inflows and outflows, as we observe a steady increase from 1979 to 2011 in the share of public transfer inflows and at the same time a decrease in public transfer outflows (Figure 4). Public transfer inflows rose from 57.2 percent of the consumption of this age group in 1979 to 64 percent in 2011. Public transfer outflows fell from -23.5 percent in 1979 to -19.2 percent in 1995 and then flattened out until 2011.

Greater financial independence for the elderly

Similar to what we have seen for young people, the financing of elderly consumption depends also mainly on the State in France. While modest at age 60, State funding steadily increases to become the dominant source of consumption financing after age 65 (Figure 2). In 2011, 61 percent of consumption of individuals aged 60+ was covered by the State and 44 percent by the individuals themselves (Figure 5). Individuals aged 60+ consequently funded younger cohorts with 5 percent of their income (private transfers:

FIGURE 5 Funding sources for consumption for ages 60+—France, 1979–2011



SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, EPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

–5 percent). State funding came mostly in the form of old-age pensions, which accounted for 63.2 percent of public transfer inflows, and healthcare, which accounted for 16.9 percent in 2011. Elder care¹² represented, with 1.3 percent of public transfer inflows, a relatively small proportion (2.5 percent after age 75). The role of old-age pensions is increasing with age. At age 60, gross public pensions (before tax deductions) accounted for 41 percent of the funding of total elderly consumption in 2011. They accounted for 70 percent at age 75 and for 74 percent at age 90. Public health consumption is also increasing with age: it accounted for 12 percent of total consumption at age 60, 20 percent at age 75, and 26 percent at age 90 in 2011.

However, Figure 5 also shows that unlike for the young, the share of public transfers in the financing of consumption for individuals aged 60+ fell from 1984 to 2011 from 71 percent to 61 percent (while it had risen slightly from 1979 to 1984 from 68 percent to 71 percent). The continuous fall of State-financed consumption between 1984 and 2011 was compensated by a rise in individual financing of consumption. Although individual funding initially fell from 45 percent to 37 percent between 1979 and 1989, it rose from 38 percent in 1995 to 44 percent in 2011.

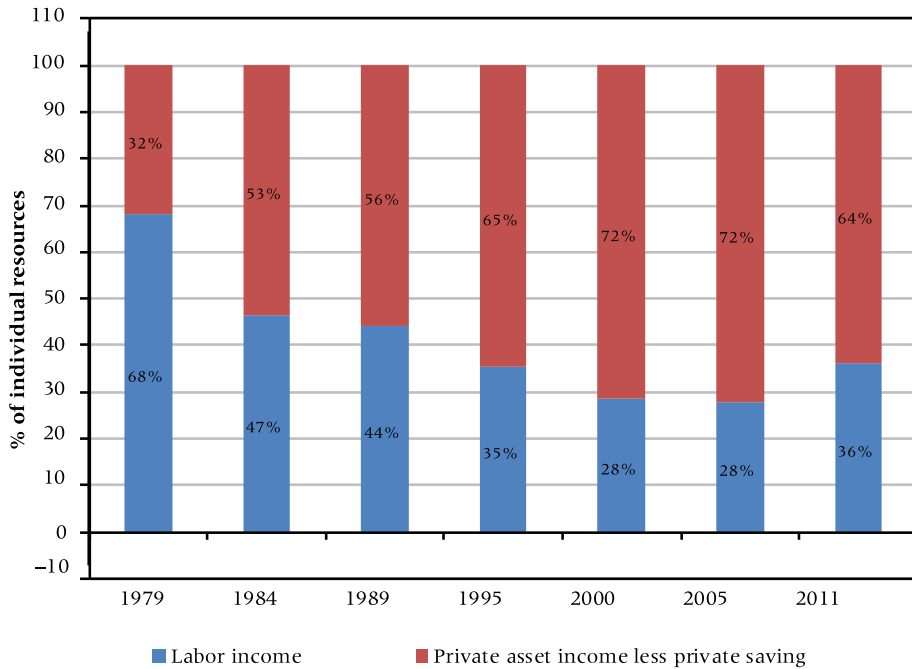
Figure 5 further shows that the contribution of family transfers to the consumption of 60+ year-olds was negative for the entire study period. On average, the private transfers of the elderly contribute slightly to the consumption of younger cohorts (youth and adults), which means that the consumption of individuals aged 60+ is not funded by private transfers from younger cohorts. However, Figure 5 also reveals a reduction in the share of net private transfers in the financing of consumption for the observed period, from -12 percent in 1979 to -5 percent in 2011. Private transfers consist of transfers within and between households. A breakdown of private transfers in the two components shows that the reduction in the share of net private transfers in consumption for individuals aged 60+ is explained by a reduction in both within- and between-household private transfers. The share in consumption of net transfers between households decreased continuously from 1979 (-7 percent) to 2000 (-2 percent), but remained relatively constant thereafter. The share in consumption of net transfers within households decreased from 1979 (-6 percent) to 1989 (-1 percent) and remained relatively constant thereafter. One explanation may be the decrease of net transfers from husbands aged 60+ to their spouses aged 59 or less due to the increased financial independence of women.¹³

The increase in the share of individual financing of the consumption of those aged 60 and over, illustrated in Figure 5, is largely due to increasing private asset income net of private savings. This income rose sharply as a proportion of individual funding from 1979 to 2005 (Figure 6). It went from 32 percent in 1979 to 72 percent in 2005, and then fell back to 64 percent in 2011. The increased share of net income from savings is mainly due to a steady increase in asset-based income from 1979 to 2000.

Figure 7 shows the evolution of the share of the State, the individual, and the family in the funding of consumption of the elderly over time, for the age groups 60-64, 65-69, 70-74, 75-79, and 80+.

The reduction in the share of public transfers in the funding of consumption affected all the older age groups fairly evenly. Along with this reduction, funding from labor income also fell from 1979 to 1984 for the 60-64 group and from 1979 to the early 2000s for those over 65. We also note a slight increase in funding from labor income in the early 2000s for both groups, the result of successive reforms of the retirement pension system by the Balladur government in 1993 and the Raffarin government in 2003. The increase in the share of private asset-based reallocation (private asset income net of private savings) involves the age groups from ages 60 to 79 in a similar manner, except for the 60-64 age group at the start of the period, when the older groups were catching up from 1979 to 1989. The share of private asset-based reallocation for the 60-64 group rose from 1 percent in 1979 to 27 percent in 2011, whereas that of private asset-based reallocation for the 65-69 group rose from 15 percent in 1979 to 39 percent

FIGURE 6 Sources of individual resources ages 60+—France, 1979–2011



SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

in 2011. Public asset-based reallocation only accounts for a very small share of total consumption in France.¹⁴

In terms of intergenerational comparisons, d’Albis and Navaux (2016) computed the per capita amounts of public transfers received by individuals aged 60+ and compared them to the ones received by individuals aged 25–59. They showed that individuals aged 60+ received 3.2 times more public transfers than individuals aged 25–59 in 1979. This ratio remained remarkably stable over 32 years as in 2011, individuals aged 60+ received 3.1 times more public transfer inflows than individuals aged 25–59. The authors also showed that the increasing aggregate share of public transfer inflows received by individuals aged 60+ between 1979 and 2011 (which increased from 35.7 percent to 44.9 percent of total public transfer inflows) was entirely due to the change in the age structure of the population. Hence, the increase of relative per capita consumption of the elderly has been financed by individual resources rather than public transfers from other age groups.

Similarly, we now compute the shares of our three different sources of funding for the different time periods for the two age groups

FIGURE 7 Share of each funding source in total consumption for ages 60+—France, 1979–2011

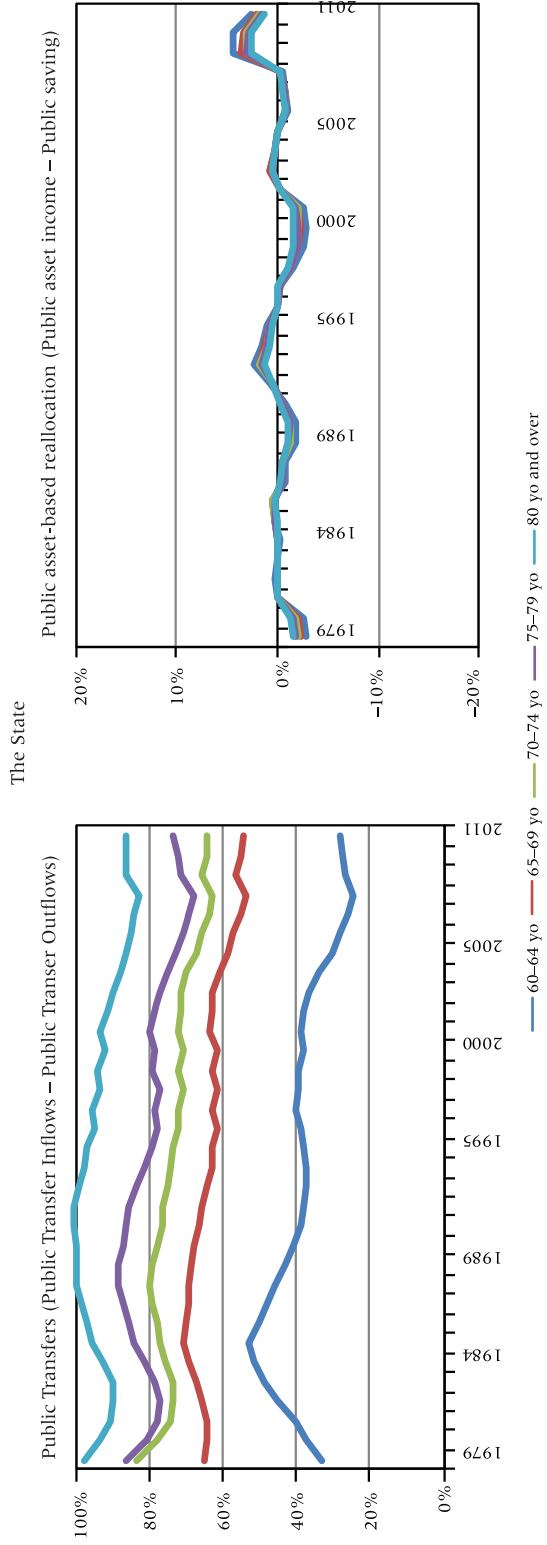


FIGURE 7 (continued)

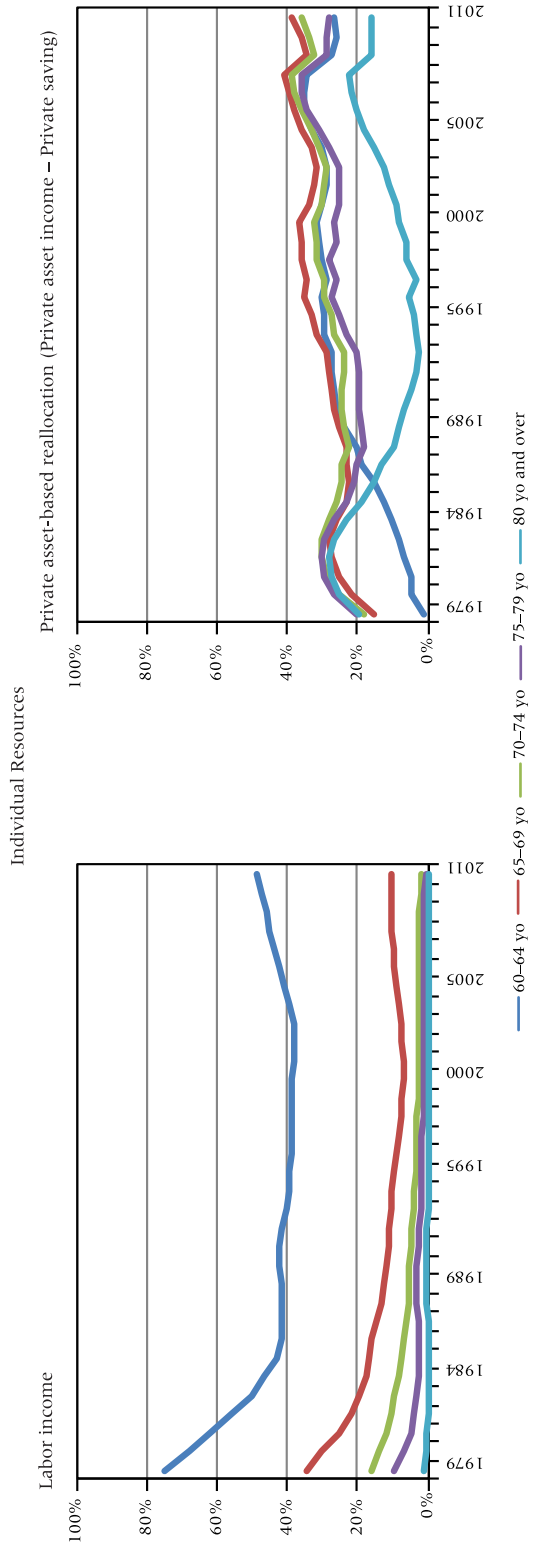
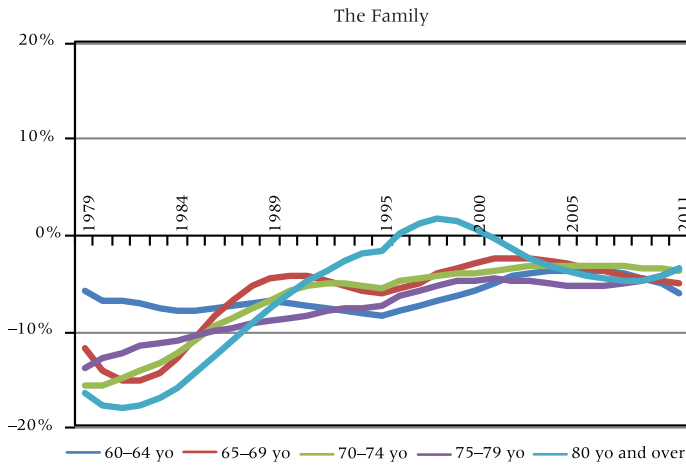


FIGURE 7 (continued)

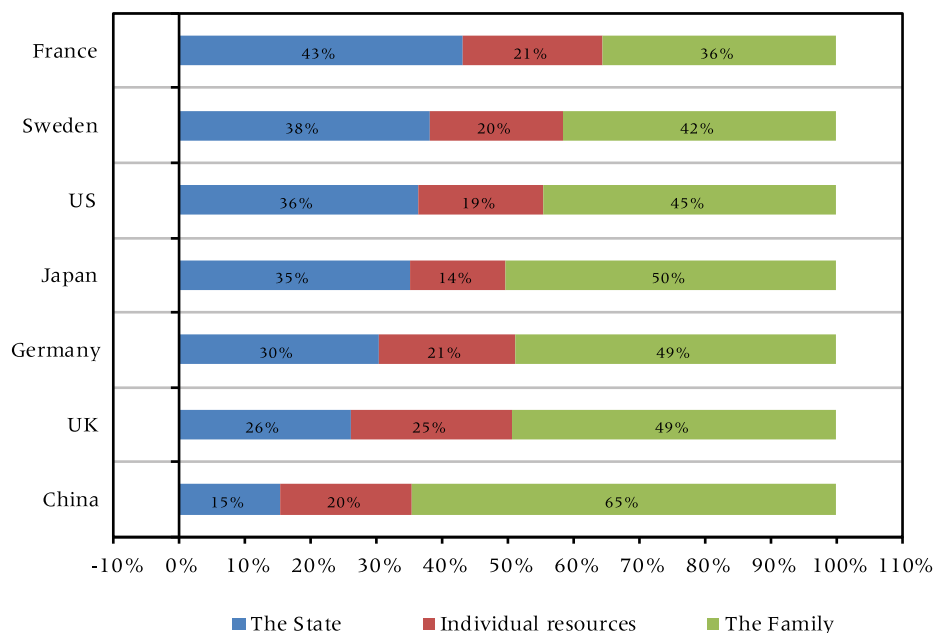


SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors.

(25 to 59, 60+), this time by supposing that the profiles by age (consumption, income, savings etc.) do not change over time but only the age structure does. We find that with this calculation, the funding shares almost do not change over time for both age groups. We derive from this result that the changes over time in the shares of the State, the individual and the family in the funding of consumption by age, which were illustrated in Figures 3 and 5, are thus not caused by demographic changes. Our finding that in France, the young got increasingly dependent and the elderly got increasingly independent in financial terms over the period 1979 to 2011, is therefore due to changes in individual behavior rather than changes in the age structure of the population.

International comparison

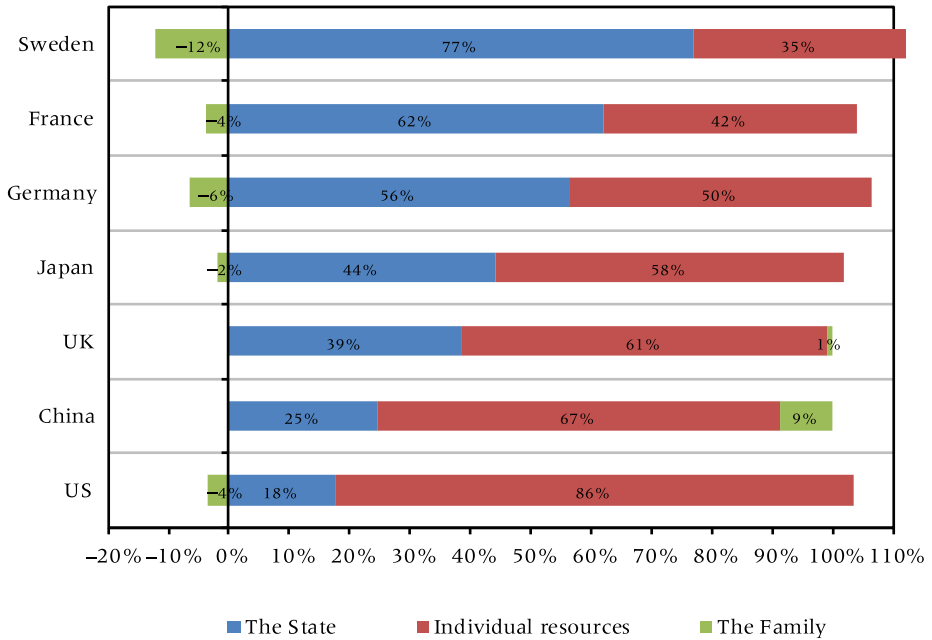
Internationally, France is distinctive in its financing of consumption of young and old. Compared with six other members of the NTA project (China, Germany, Japan, Sweden, United Kingdom, and the United States), France is the country where the young benefited most from public transfers.¹⁵ In 2005, the French State funded 43 percent of the consumption of the 0–24 age group, well ahead of Sweden, which came second with 38 percent (Figure 8). The United States came third with 36 percent, followed closely by Japan with 35 percent. China came last in the panel with only 15 percent. France is the only one of the seven countries where

FIGURE 8 Funding sources of consumption before age 25—cross-country comparison

SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors; for the other countries, international data from the National Transfer Accounts.

the State's share of funding is the largest of the three sources. In the other countries, private transfers are largest for the young, particularly in China where private spending on education is very important and private transfers finance 65 percent of the consumption of the 0–24 age group.

The funding of elderly consumption depends mostly on the State in the three continental European countries. Seventy-seven percent is funded by the State in Sweden, 62 percent in France and 56 percent in Germany (Figure 9). The rest is individually funded, namely 50 percent in Germany, 42 percent in France, and 35 percent in Sweden. All three countries display downward private transfers, much higher in Sweden (–12 percent) than in Germany (–6 percent) and France (–4 percent). In all the other panel countries, individual financing is the largest component of elderly consumption: 86 percent in the United States, 67 percent in China, 61 percent in the United Kingdom, and 58 percent in Japan. Like the continental European countries, the United States and Japan have downward private transfers, and only China has significant upward private transfers (9 percent) to fund

FIGURE 9 Funding sources of consumption for ages 60+—cross-country comparison

SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors; for the other countries, international data from the National Transfer Accounts.

the consumption of the elderly. In the United Kingdom, upward private transfers account for 1 percent of consumption.

The analysis of the financing of consumption at each age reveals each country's special characteristics. In most European countries, governments support programs (public pension and healthcare programs) for the elderly. In France, Germany, and Sweden, from the age of 65, the State provides most funding, whereas it plays only a minor role, even after age 70, in the United Kingdom, United States, and China. Sweden is the country where the State share rises fastest from age 65 to age 70. In all panel countries, the State's share in funding consumption rises with age, except for China, where it rises until age 74 and then regularly declines (Figure 10).

Conclusion

In this article, we have applied the NTA method to France to gain an understanding of economic flows between generations. Our particular interest

FIGURE 10 Funding sources for consumption—cross-country comparison

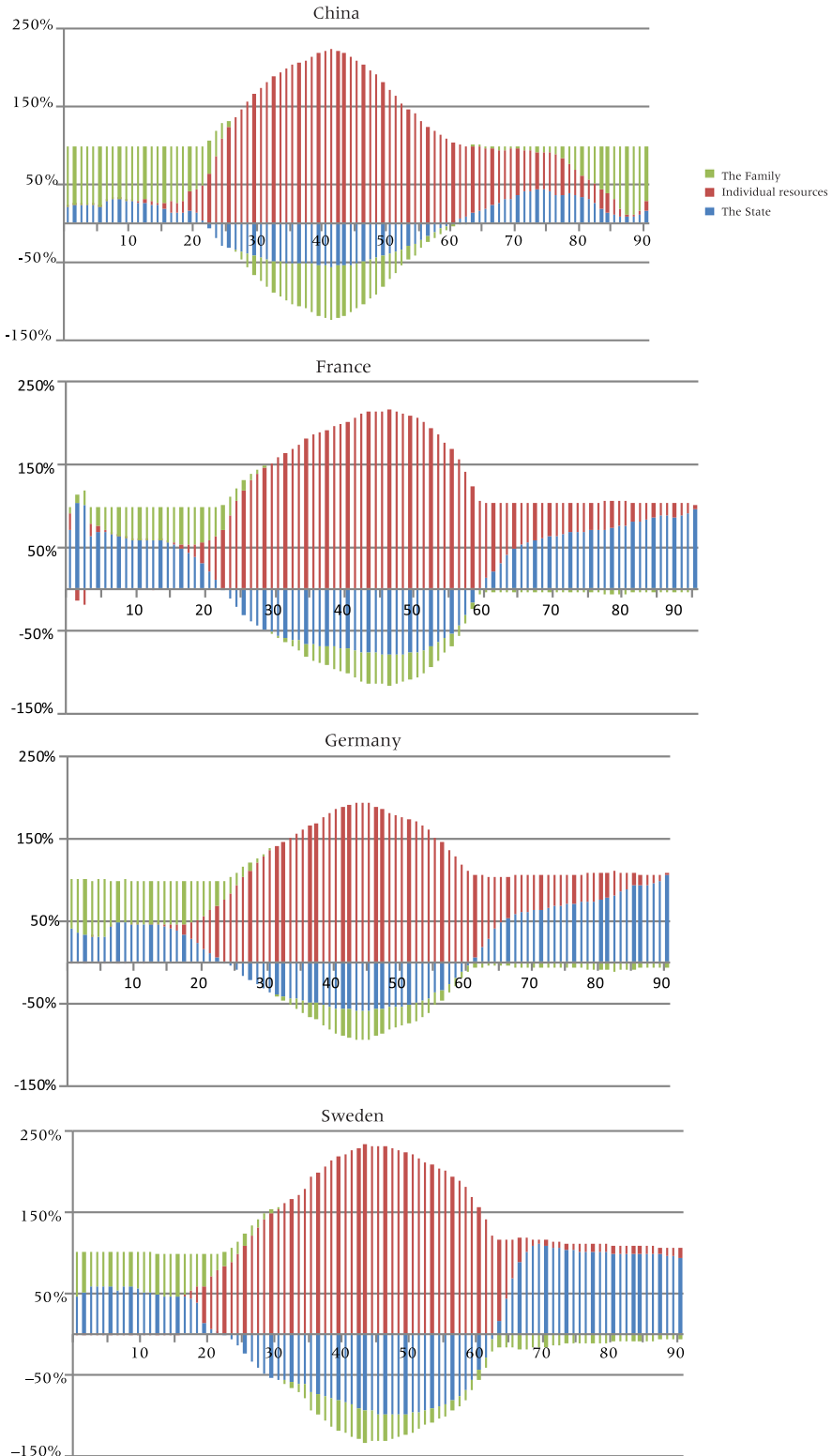
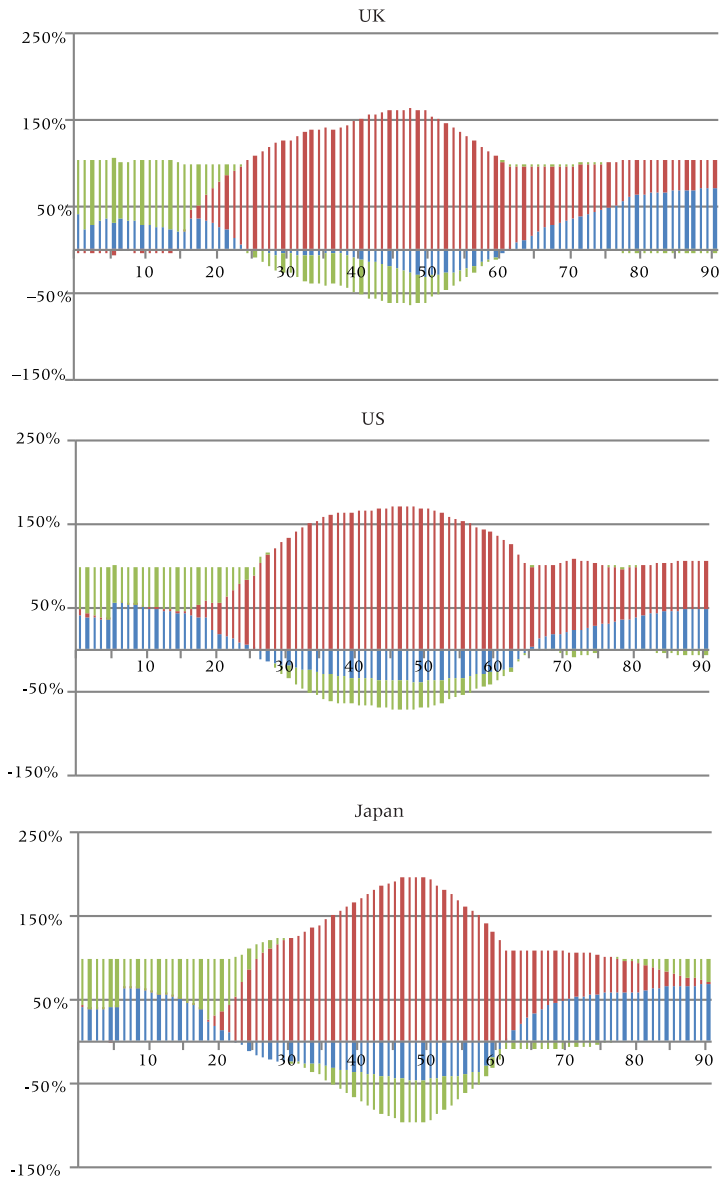


FIGURE 10 (continued)



SOURCES: French Household Expenditure Survey (*Enquête Budget de Famille*), French Wealth Survey (*Enquête Patrimoine*), French Financial Asset Survey (*Enquête Actifs Financiers*), French Health and Social Protection Survey (*Enquête santé et protection sociale, ESPS*), permanent sample of people insured under the state health insurance scheme (*Échantillon Permanent d'Assurés Sociaux, EPAS*), 2008 French Household Disability and Health Survey (*Enquête Drees Handicap Santé Ménage*) and 2009 French Institutions Disability and Health Survey (*Enquête Drees Handicap Santé Institutions*), National Accounts. Calculations by the authors; for the other countries, international data from the National Transfer Accounts.

lies in the question how far the State and individuals share the responsibility for financing the consumption of different generations.

By comparing the funding of consumption of the young (ages 0–24), adults (ages 25–59) and the elderly (ages 60+), we find that, while consumption of the elderly increased compared to the younger generations over the 1979–2011 period, the funding of that consumption did not result from more public transfers (per capita) to the elderly. The elderly are instead more autonomous and finance themselves increasingly by their own means, not only due to lower public transfers, but also due to reduced financial transfers to younger generations (adults and the young).

At the same time, the financial dependence of the young has been increasing over the observed period. The share of individual financing of the consumption of those aged 0–24 decreased between 1979 and 2011. They receive more public, but also—albeit to a much lesser extent—more family transfers to finance their consumption. Increases in the State-funded consumption of the young concern especially two age groups: the very young, who receive more generous family benefits, and those aged 18–24, who benefit from higher public investment in education. Longer educational enrollment thus reduces the relative private consumption of the young but increases their relative public consumption.

Despite the decrease over the last decade in the relative contribution of the State to financing the consumption of the elderly, public funding of the elderly remains significant in France in comparison to other countries. Among the seven NTA countries, France ranks second, just behind Sweden, in the role of the State for the elderly. Yet, our results show that public spending for the elderly has not reduced the relative importance of the State in financing the consumption of the young. For the age group 0–24 years, France is the country where the State plays the largest role, especially for children under the age of 15.

A massive change in the age structure of the French population has occurred over the last decades, in particular due to the Baby Boomer cohorts. We find, however, that the public per capita expenditure for the elderly has remained relatively stable, while their consumption has increased. The increasing financial autonomy of the elderly, combined with decreasing financial independence of the young, is thus a result of changes in individual behavior rather than demographic changes. We find, however, that demographic changes play an important role for the aggregate levels of consumption.

We conclude that, despite a potential conflict in the allocation of public resources between the elderly and the young, population aging in France does not imply a withdrawal from public responsibility to invest in the future of the young. In comparison to the other countries in our analysis, both the elderly and the young depend less on family solidarity, even if family transfers have increased for the young over the last decades in France.

As individual and public funding complement each other, the system of national solidarity is at the expense of neither individuals nor family solidarity. Consequently, consumption financing in France is most similar to the concept of “multi-solidarity,” as it cannot be said that either individual or public responsibility is placed above the other. When it comes to the funding of the young generations, the United States, Japan, Sweden, and Germany may also be classified as countries characterized by “multi-solidarity.” Only in the United Kingdom and China does individual responsibility dominate in the funding of consumption by the young. When it comes to the funding of the elderly, Sweden, Germany, and Japan join France in the concept of “multi-solidarity” with a relatively balanced responsibility between public and private funding. In the United States and United Kingdom, but also in China, the financing of the consumption of the elderly devolves more on the individual, who has greater responsibility to provide for his own needs in old age.

Despite “multi-solidarity” in France for both the young and the elderly, our finding points out that the latter increasingly finance themselves by accumulating assets. This trend may give rise to two risks. First, when individual provision falls short, as it often will, it may increase elderly dependency on other family members. Second, the increasing need to take financial precautions for oneself may come at the expense of inter-generational transfers to adult children and their children. Both are likely to lead to rising inequality, with the first having particularly significant effects on the elderly.

Consequently, even though France succeeds quite well in sharing responsibilities between different agents in comparison to other countries, there is a risk that welfare inequalities will increase in the near future, especially for the elderly. Those inequalities would add—and potentially reinforce—health and longevity inequalities across socioeconomic groups, which are already important in France. For the young, the situation is ambiguous: the increasing importance of (diminishing) family transfers would increase inequalities, while the increasing importance of (still rising) public transfers would reduce them.

Limitations

While the NTA approach contributes significantly to understanding the impact of demographic change on the broader economy in France, it faces nevertheless several limitations and challenges. First, the NTA age profiles are a cross-sectional analysis of individuals observed at various time periods, which means we do not trace individuals throughout their lives. As profiles change over the years, the extent to which the NTA profiles can be used to forecast economic behavior of future generations is limited. A possibility to

overcome this difficulty is to create pseudo-panels as proposed by d'Albis and Badji (2017).

Second, the accuracy of the NTA profiles depends on the quality of the survey data used. Even though all surveys used in this study are representative of the population, the attribution of observed funding and consumption items to different household members turned out to be a difficult undertaking when these items were not observed on an individual but on a household basis. This information gap encourages us to develop attribution tools that are less accurate than if public transfers had been continuously observed on an individual basis in all waves. In general, the lack of data also leads us to apply a common sharing rule for the consumption of goods and services inside the household, which might not always correspond to reality (see d'Albis and Moosa 2016, for a more detailed discussion of this criticism).

Third, the NTA profiles present averages per age, but we do not distinguish between different populations. We find that on average, the elderly increasingly finance their needs with their own means, especially relying on a steady increase in asset-based income. But we should keep in mind that wealth is unevenly distributed. Besides, certain individuals aged 65+ are dependent on private transfers from their families and some others contribute to financing the needs of younger family members. Elderly women might be more in need of private transfers than elderly men, and differences between socioeconomic categories, regions, etc. are certainly also worth taking into account.

Nonetheless, and despite such limitations, the NTA approach employed here represents the best available tool to engage what has throughout history been, and will continue to be, one of the fundamental problems that societies must solve: how to effectively and equitably finance the consumption of persons too young or too old to produce income sufficient to finance themselves.

Notes

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1 <https://ctn.site.ined.fr/en/>

2 See for example Sambt and Prskawetz (2011) for Austria, Lai and Tung (2015) for Taiwan and Patxot *et al.* (2012) for Spain.

3 See for example Miller (2011), Mason and Lee (2011) and d'Albis *et al.* (2017).

4 Expenses in first employment are broken down according to the profiles for unemployment benefits and the profiles for industrial injury and sickness benefits according to the profiles for income from salaries.

5 See d'Albis *et al.* (2015) for details of the method for calculating salaries.

6 This normalization is often used in NTA (see Lee and Mason 2011b, d'Albis *et al.* 2017). It facilitates both intertemporal and international comparisons.

7 The number of years of study has increased considerably over the period as a result of policies aiming at raising educational attainment. Schooling life expectancy between the ages of 2 and 29 rose from 16.9 years in 1985–1986 to 18.8 years in 1995–1996, before decreasing slightly until 2013–2014, when it reached 18.3 years (Ministère de l'Éducation Nationale 2016).

8 The increasing age of entry into working life explains part of this result. Note that when we constrain the age group to individuals aged 0 to 18, the indicator still increases sharply.

9 The collapse in individual funding from 1984 to 1989 is associated with the decline in labor income for the youngest age groups and on-off features in private transfers in 1989. That year, private intra-household transfers were much higher than the two years before and after 1989.

10 Cash support to families, investments in childhood education (pre-school from age two and a half on), high level of

child care coverage for children aged 0–2 (crèches, subsidies, and tax deductions for child minders and nannies), parental leave benefits.

11 From 1979 to 2011, the increase in family benefit expenditure has been especially rapid due to a rather continuous increase in lump sum cash benefits around childbirth and in public child care coverage, the introduction of child care subsidies (for nannies and child minders) and parental leave benefits during the 1990s, and the increase of child care subsidies and parental leave benefits during the 2000s.

12 Elderly individuals in France are eligible for individualized autonomy benefits (named APA) if they need help for daily activities, for elderly individuals' solidarity benefits (ASPA) if their income is low, and for supplementary invalidity benefits (ASI) if they have a disability and are below official retirement age.

13 In a gender decomposition of net private transfers, Renteria *et al.* (2016) highlight that among the elderly population, women are net private transfer recipients while men are net donors.

14 Public asset-based reallocation accounts for 2.9% of total consumption in 2011.

15 We used the NTA data available on May 18, 2018 on www.ntaccounts.org: Germany (2003), Sweden (2003), United Kingdom (2012), United States (2006), Japan (2004), and China (2002).

References

- d'Albis, Hippolyte and Ikpidi Badji. 2017. "Intergenerational inequalities in standards of living in France." *Economie et Statistique / Economics and Statistics* 491–492: 71–92.
- d'Albis, Hippolyte, Carole Bonnet, Julien Navaux, Jacques Pelletan, Hector Toubon, and François-Charles Wolff. 2015. "The Lifecycle Deficit for France, 1979–2005." *The Journal of the Economics of Ageing* 5: 79–85.
- d'Albis, Hippolyte, Carole Bonnet, Julien Navaux, Jacques Pelletan, and François-Charles Wolff. 2017. "Lifecycle Deficit in France: An Assessment for the period 1979–2011." *Economie et Statistique / Economics and Statistics* 491–492: 47–70.
- d'Albis, Hippolyte and Dalal Moosa. 2016. "Generational Economics and the National Transfers Accounts." *Journal of Demographic Economics* 81: 409–441.
- d'Albis, Hippolyte and Julien Navaux. 2016. "La répartition par âge des transferts publics en France," In *Choc démographique, rebond économique*, edited by Jean-Hervé Lorenzi. Editions Descartes et Cie, Collection Chaire Transitions Démographiques, Transitions Économiques.

- Allais, Maurice. 1947. *Economie et Intérêt: Présentation nouvelle des problèmes fondamentaux relatifs au rôle économique du taux de l'intérêt et de leur solutions*. vol. 2 Paris, France: Imprimerie Nationale.
- Auerbach, Alan, Jagadeesh Gokhale and Laurence Kotlikoff. 1992. "Generational accounting: A new approach to understanding the effects of fiscal policy on saving." *The Scandinavian Journal of Economics* 94(2): 303–318.
- Chen, Tingyun, Jean-Jaques Hallaert, Alexander Pitt, Haonan Qu, Maximilien Queyranne, Alaina Rhee, Anna Shabunina, Jérôme Vandenbussche, and Irene Yackovlev. 2018. "Inequality and Poverty across Generations in the European Union." *IMF Staff Discussion Notes* No. 18/01.
- Diamond, Peter. 1965. "National debt in a neoclassical growth model." *American Economic Review* 55(5): 1126–1150.
- . 1996. "Generational Accounts and Generational Balance: An Assessment." *National Tax Journal* 49(4): 597–607.
- Harris, Amy Rehder, William Evans and Robert Schwab. 2001. "Education spending in an aging America." *Journal of Public Economics* 81: 449–472.
- Haveman, Robert. 1994. "Should generational accounts replace public budgets and deficits?" *Journal of Economic Perspectives* 8(1): 95–111.
- Kotlikoff, Laurence. 1995. "Generational accounting." *NBER Reporter*.
- Lai, Nicole Mun Sim and An-Chi Tung. 2015. "Who supports the elderly? The changing economic lifecycle reallocation in Taiwan, 1985 and 2005." *Journal of the Economics of Ageing* 5: 63–68.
- Lee, Ronald. 1980. "Age structure, intergenerational transfers and economic growth: An overview." *Revue économique* 31(6): 1129–1156.
- . 1994. "Population Age Structure, Intergenerational Transfer, and Wealth: A New Approach, with Applications to the United States." *Journal of Human Resources* 29(4): 1027–1063.
- Lee, Ronald and Andrew Mason. 2011a. "Generational Economics in a Changing World", *Population and Development Review* 37(supplement): 115–142.
- Lee, Ronald and Andrew Mason, eds. 2011b. *Population Aging and the Generational Economy: A Global Perspective*. Cheltenham, UK; Northampton, MA, USA: Edward Elgar Publishing.
- Lee, Ronald, David McCarthy, James Sefton, and Joze Sambt. 2017. "Full Generational Accounts: What Do We Give to the Next Generation?" *Population and Development Review* 43(4): 695–720.
- Luci-Greulich, Angela and Olivier Thévenon. 2013. "The impact of family policy packages on fertility trends in developed countries." *European Journal of Population* 29(4): 387–416.
- Mason, Andrew, Ronald Lee, An-Chi Tung, Mun-Sim Lai, and Tim Miller. 2009. "Population Aging and Intergenerational Transfers: Introducing Age into National Accounts." In *Developments in the Economics of Aging*, edited by David A. Wise, 89–122. University of Chicago Press, NBER Book Series— The Economics of Aging.
- Mason, Andrew and Ronald Lee. 2011. "Introducing age into national accounts." In *Population Aging and the Generational Economy*, edited by Ronald Lee and Andrew Mason, 55–78. Cheltenham, UK; Northampton, MA, USA: Edward Elgar Publishing.
- Masson, André. 2002. "Méthode et usages des comptes générationnels: un regard décalé." *Économie et Prévision* 154(3): 1–24.
- Ministère de l'Éducation Nationale. 2016. "L'Etat de l'école," n° 26.
- Miller, Tim. 2011. "The rise of the intergenerational state: Aging and development." In *Population Aging and the Generational Economy*, edited by Ronald Lee and Andrew Mason, 161–184. Cheltenham, UK; Northampton, MA, USA: Edward Elgar Publishing.
- Modigliani, Franco and Richard Brumberg. 1954. "Utility analysis and the consumption function: An interpretation of cross-section data." In *Post-Keynesian Economics*, edited by Kenneth K. Kurihara, 388–436. New Brunswick: Rutgers University Press.
- Patxot, Concepcio, Elisenda Rentería, Sanchez Romero, and Guadalupe Souto. 2012. "Measuring the balance of government intervention on forward and backward family transfers using NTA estimates: the modified Lee arrows." *International Tax and Public Finance*, Springer 19(3): 442–461.
- Poterba, James. 1997. "Demographic Structure and the Political Economy of Public Education." *Journal of Policy Analysis and Management* 16: 48–66.

- . 1998. "Demographic change, Intergenerational Linkages, and Public Education." *The American Economic Review* 88(2): 315–320.
- Preston, Samuel. 1984. "Children and the Elderly: Divergent Paths for America's Dependent." *Demography* 21(4): 435–457.
- Rentería, Elisenda, Rosario Scandurra, Guadalupe Souto, and Concepcio Patxot. 2016. "Intergenerational money and time transfers by gender in Spain: Who are the actual dependants?" *Demographic Research* 34(24): 689–704.
- Sambt, Joze and Alexia Prskawetz. 2011. "National Transfer Accounts for Austria: low levels of education and the generosity of the social security system." In *Population Aging and the Generational Economy*, edited by Ronald Lee and Andrew Mason, 256–268. Cheltenham, UK; Northampton, MA, USA: Edward Elgar Publishing.
- Samuelson, Paul. 1958. "An exact consumption-loan model of interest with or without the social contrivance of money." *Journal of Political Economy* 66(6): 467–482.
- United Nations. 2013a. "Intergenerational solidarity and the needs of future generations." Report of the Secretary-General.
- . 2013b. "National Transfer Accounts manual: Measuring and analyzing the generational economy." Department of Economic and Social Affairs, Population Division.