

# How Intergenerational Transfers Finance Lifecycle Deficit in Spain

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## ABSTRACT

In this chapter we present the estimates of the national transfers occurring among age groups in Spain in year 2000 using the NTA methodology proposed by Mason, Lee and others (2006). The life cycle deficit is positive –a surplus– for ages 27 to 57, while the rest of individuals become dependent, being the age reallocations of both age groups quite different. On the one hand, during childhood and youth, individual consumption is mainly financed by private transfers (69%) while public transfers only amount to a 32% being mainly in-kind transfers, through education and health systems. On the other hand, older people finance their lifecycle deficit mainly through asset-based reallocations (66%), followed by public transfers (41%, composed both of substantial cash transfers –retirement and survivor pensions– and in-kind health benefits).

Interestingly, we find that the elderly are net payers of private transfers, implying that they are transferring money or housing services to the young members of their family. This surprising result could be explained by the high proportion of co resident elderly. This together with the fact that all individuals aged more than 16 pay and receive private transfers at the same time indicates that private support and hence intergenerational sharing tends to be mutual in Spain, implying that Spain is half-way between the northern European countries and the Latin-American countries.

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## Introduction

Spain is among the European countries that have experienced rapid economic development and demographic change in recent decades. In 1986 it joined the European Economic Community (the predecessor of the current European Union), and it has belonged to the European Monetary Union since 2002. The country is undergoing one of the fastest aging processes in Europe, speeded by very low fertility and high life expectancy. In recent years it has also experienced a huge inflow of immigrants. There is growing concern about how all these demographic changes are going to affect the Spain's welfare system and its policies for supporting the elderly and investing in human capital, particularly children. Analyzing how economic flows operate between different ages or how resources are allocated among ages can help us understand how these demographic changes are going to affect economic trends such as inequality and growth. Moreover, it can help us interpret the effects of aging on the current social security system.

In this chapter we present estimates of the national transfers occurring among age groups, using the methodology proposed by Mason et al. (2006) and Lee and Mason (2004).<sup>1</sup> The estimates refer to Spain in the year 2000. We begin by describing recent economic and demographic trends there, and by explaining its social insurance system and the tax system. Then we present the methodology and the data sources used for the estimation, noting the specifics of the assumptions we used to calculate the profiles for Spain, and discuss the main results. Finally, we summarize our main conclusions.

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## **Demographic Characteristics and Trends**

Compared with its neighbors, Spain has experienced a late demographic transition and with very different characteristics (Perez, 2001). As a result, its aging process started later. In 1970 Spain had the second highest fertility rate in Europe (only behind that of Ireland), but the pace of the decline in fertility during recent decades has been very rapid and the degree of the decline has been extreme. Currently Spain has one of the world's lowest fertility rates (Grant et al., 2004). It reached 1.16 births per woman in 1996, although by 2006 it had risen again to 1.38. Moreover, Spain has one of the highest life expectancies in the world—for women in 2005 it was 83.5 years—something that reinforces aging trends.

The combination of rapid fertility decline and greater longevity has caused one of the fastest aging processes among European countries. In Spain it took only 45 years for the proportion of people aged 65 and over to rise from 7 to 14 percent, whereas in France it took 115 years to reach that proportion (Kinsella and Velkoff 2001: 13). By 2000 the proportion of people older than 65 was already greater than the proportion of people younger than 15. This was only happening in just five other countries—Bulgaria, Germany, Greece, Italy, and Japan (Kinsella and Velkoff 2001:10).

This aging process has been slowed by recent migration trends. The stock of immigrants in Spain jumped from fewer than 1 million in 1997 to more than 5 million in 2006, and now represents more than 10 percent of the total population. Hence, in less than a decade Spain received a share of immigrants in its population close to that held by traditional immigrant-receiving European countries such as Germany (Collado et al., 2004). Although immigration can help to overcome the effects of the aging process by reducing the share of elderly individuals in a population and by increasing the fertility rate, most of Spain's immigrants are close to baby boomers in age. This means that in the near future those

individuals of working age will become part of the growing share of elderly in the population, thus accelerating the aging process.

### **Economic Setting**

Spain's economic evolution has been quite positive in recent years. Between 1995 and 2006, Spanish GDP grew by about 50 percent in real terms, while the mean GDP for the EU-15 grew less than 30 percent. Other economic indicators, such as unemployment and labor force participation rates, improved considerably as well. The unemployment rate went from 22 percent in 1995 to 8 percent in 2007, and the participation rate rose to 59 percent from 50 percent in the same period. The increase in employment was driven mainly by increases in women's and foreign workers' participation. Nevertheless, female employment rates remain among the lowest of the European Union.

Spanish GDP per capita is close to the European Union average. By 2007 it was more than 95 percent of the EU-15 average, whereas in 1986 it had been only 75 percent of the average for those countries. Similarly, it is close to the OECD countries' average.

### **Social Insurance**

The Spanish welfare state is based on a variety of expenditure programs, which effect a major redistribution of resources among individuals. The public pension system is the largest of these, entailing an annual expenditure of about 10 percent of GDP. It is organized on a pay-as-you-go basis under a defined-benefit scheme. It has a contributory part, in which benefits depend on years contributed and past contributions, and which requires a minimum period of contribution payments. It also has a noncontributory part, which provides a means-tested minimum income for people without earnings-related pension benefits. The general pension scheme is mandatory for all employees and the self-employed; it covers, in addition, retirement pensions, disability, survivors, and risks such as maternity leave and temporary disability. There are additional supplementary pension plans, such as occupational schemes

and individual pension plans, but their coverage is quite limited. Currently, the public contributory system provides a high replacement rate—over 90 percent—for low and average wages, but not for high wages because there are ceilings on benefits. The living standard of people aged 65 and over is about 78 percent of that for the population aged 0–64, while their risk of poverty is more than 25 percent, considerably higher than the 20 percent for the general population.

Health care, the second major component of the Spanish welfare state, is basically publicly financed: only 30 percent of total health care expenditure is private. The public system is organized as a National Health Service; that is, it provides assistance to the whole population and is financed through general public revenues. Public expenditure on health represents over 6 percent of GDP, whereas in 1970 it accounted for only 2.4 percent. This is a common trend in most developed countries, where health care spending has been rising steadily; and this growth is expected to continue not only because of demographic trends, but also because of other factors such as technological advances and the demand for better quality health care<sup>2</sup>.

The education system can be considered as the third pillar of the Spanish welfare system. It is mainly publicly financed, representing 10 percent of total public expenditure and 5 percent of GDP. Compulsory education in Spain starts at age 6 and ends at age 16, covering primary and lower secondary education. Preprimary education for children of ages 3–5 is also publicly financed, although voluntary, as is upper secondary education. Tertiary education is only partly publicly financed because students who attend public institutions of higher learning assume some of the cost. Enrolment rates are practically 100 percent for the compulsory stages, and high also for the voluntary ones. For example, enrolment rates for

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<sup>2</sup> See Abío (2006) for an analysis of future perspectives of Spanish health care expenditure and the possibility of assigning different financing sources to it.

tertiary education are above 40 percent, similar to those of France or Germany, but below those of Scandinavian countries—Sweden, Denmark, and Norway—which are above 60 percent.

Other social programs, such as unemployment protection, subsidies for families, and long-term care, complete the Spanish welfare state. Long-term care began to be regulated only in 2007, and no clear financial counterpart has been assigned to it.<sup>3</sup> Probably the welfare state is not as generous in Spain as in other European countries, but it certainly will face challenges posed by aging in the near future. Possibly some potential savings in education expenditure and other expenditure programs directed to the young could help to overcome the increase in other expenditures due to aging. But these savings would never be sufficient to compensate for the huge increases expected in pension and health care programs. Furthermore, the low level of expenditure on the young in Spain—the share of GDP devoted to family programs is around 0.5 percent, compared with the EU average of more than 2 percent—demands an additional effort along these lines, especially if there is an attempt to foster a recovery of the extremely low fertility rate in Spain.<sup>4</sup>

### **The Tax System**

The Spanish tax and contribution system has not had major changes in recent years. Workers' and employees' contributions to the Social Security System are the main source of fiscal revenues, representing more than 37 percent of the total in 2000 and nearly 13 percent as a share of GDP (Table 1). Currently the total contribution rate is 28.6 percent of the gross

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<sup>3</sup> The coverage of the public LTC system was very limited in the base year 2000, while most depended elderly relied on informal care. Costa and Patxot (2004) estimate in a generational accounting framework, the effect of extending the public coverage to all dependents. The estimate for intertemporal debt almost triples as a result of this.

<sup>4</sup> Patxot and Farré (2007) simulate the effects of converging to European standards in education, family programs, and long-term care in a generational accounting framework. The sustainability gap doubles as a result of this change.

wage, and it has not been changed in recent decades.<sup>5</sup> Contributions are assigned to finance the Social Security System, which provides contributory pensions and unemployment subsidies. Taxes on production and imports are the second source of public revenues, representing one-third of total fiscal revenue. Value-added tax (VAT), introduced in 1986, is the most important figure in this category. Finally, taxes on income and wealth contribute nearly 30 percent of fiscal revenues, personal income tax being the largest; it is approximately double the corporate income tax rate.

[Table 1 about here]

### **National Transfer Accounts (NTA) methodology: a brief summary**

NTA basically tries to disentangle those resources that move among the different age groups –called *age reallocations*– either through the capital market –asset based reallocations– through government intervention –tax payment and transfers receipts– or through both inter or intrafamily transfers. In order to do so it translates all the SNA aggregates in a given year into age specific values as follows. Starting from a transformation of the base year SNA identity, rearranged as shown in Equation [1],

where  $Y$  stands for labor ( $l$ ) and asset ( $a$ ) income and  $t$  stands for public ( $g$ ) or family ( $f$ ) transfer inflows (+) or outflows (-).

$$Y_l + Y_a + t_g^+ + t_f^+ = I + t_g^- + t_f^- \quad [1]$$

where  $Y$  stands for labor ( $l$ ) and asset ( $a$ ) income and  $t$  stands for public ( $g$ ) or family ( $f$ ) transfer inflows (+) or outflows (-).

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<sup>5</sup>There are some special regimes for contributing to Social Security with other contribution rates.

Rearranging, we obtain [2],

$$C - Y_l = Y_a - S + \mathbf{t}_g^+ - \mathbf{t}_g^- + \mathbf{t}_f^+ - \mathbf{t}_f^- \quad [2]$$

for the whole Economy, though it also holds for each age group,  $e$ ,

$$C(e) - Y_l(e) = Y_a(e) - S(e) + \mathbf{t}_g^+(e) - \mathbf{t}_g^-(e) + \mathbf{t}_f^+(e) - \mathbf{t}_f^-(e) \quad [3]$$

The left hand side, called life cycle deficit, is the excess resources consumed by each age group, which must be financed either by asset base reallocations –asset income minus savings- or net public ( $\mathbf{t}_g^+ - \mathbf{t}_g^-$ ) or family ( $\mathbf{t}_f^+ - \mathbf{t}_f^-$ ) transfers, called  $TG$  or  $TF$ , respectively.

Hence we can also express it as,

$$LCD = ABR + TG + TF \quad [4]$$

or

$$LCD(e) = ABR(e) + TG(e) + TF(e) \quad [5]$$

as it also holds both for the whole economy and for each age cohort.

### **National Transfer Accounts for Spain in 2000**

The NTA estimation for Spain starts from the macroaggregates published by the National Statistical Office (Instituto Nacional de Estadística, or INE) and the government (Intervención General de la Administración del Estado, or IGAE), reclassified in the standard way to meet the available microprofiles. We have used several microdata sets to construct age profiles to allocate these macroeconomic figures to different age groups in the population, as detailed below (see also the Annex). First, we describe data used for describing the private economic lifecycle. Second, we explain the data sources employed to derive the public inflows and outflows. Third, we discuss the data needed to compute inter- and intrahousehold family transfers, reserving for later discussion the data used to obtain the asset-based reallocation profile—basically the asset income profile. For computing age profiles, we started with the generational accounting age profiles obtained by Abío et al.



(2003 and 2005). For the NTA we also need to obtain profiles for the private economic lifecycle, and therefore we recalculated some of the tax and transfer profiles in accordance with it. We tried to use microdata close to the base year of our computation, 2000. In Spain there is no single household survey that includes both reliable income and consumption data. Hence, we combined information from the two main Spanish household surveys conducted in that year. They were the Encuesta Continua de Presupuestos Familiares (Continuous Survey of Family Budgets, or ECPF), a household consumption survey, and the EU Household Panel (which focused more on income data).<sup>6</sup> We use official data based on the whole population when they were available. Table 1 in the Appendix summarizes the profiles obtained and the data sources employed. Details on the estimation procedure in each case are given below.

### **Economic Lifecycle Deficit (LCD)**

To construct consumption profiles by age, we divided total consumption into public and private consumption. We further broke down both categories into more detailed categories, depending on data availability.

For private consumption (CF), we estimated profiles of expenditure on health, education, housing, and other consumption.<sup>7</sup> For all profiles, our data base was the ECPF household consumption survey for 2000. Information about private consumption of health care includes, in the ECPF, out-of-pocket expenditures for medical specialists, hospitals, and

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<sup>6</sup>The ECPF, conducted by the INE ([www.ine.es](http://www.ine.es)), started in 1985, was revised in 1997, and ended in 2005. In 2006 the INE replaced it with an annual survey, the Encuesta de Presupuestos Familiares (EPF). That survey is carried out quarterly and follows up a family for eight quarters (two years). We selected only those families that had participated during the four quarters of 2000, so that our sample comprises 3,766 households and 11,842 individuals. Data from the EU Household Panel, conducted by European Commission's Eurostat, are available for the period 1996–2001. The survey that replaced it, the Encuesta de Condiciones de Vida (ECV), began in 2004. Abío et al. (2005) used the 1998 data set from the EU Household Panel, whereas we use the 2000 data set.

<sup>7</sup>The latter includes the estimated consumption flow of owner-occupied housing, while the actual rent paid is considered as other private consumption, in accordance with NTA methodology.

medicines. In Spain, however, it is common to have private health insurance, for which people pay premiums and do not pay out-of-pocket costs when they consume health services. We therefore included the premiums as part of private health expenditure.

Budget information collected by the survey is reported by each household. It is therefore necessary to allocate this total household expenditure by age of family members, but there is no information on the utilization rate of services. Hence, we decided to apply a simple regression analysis of private health expenditure (including expenditure on insurance premiums) reported by households among all household members by age group.<sup>8</sup>

With respect to expenditure on private education, information available in the ECPF is not very complete. Only tuition, fees, and tutoring expenses are included. Books and school supplies are registered as bookstore expenditures. Thus, families with students enrolled in public schools do not report any education expenditure. Furthermore, the ECPF provides no information about school enrolment before age 16. To allocate education consumption to household members who were in school, we used the government's official rate for school enrolment among people younger than 16 within households. For a family with two children aged 3 and 6, for example, this meant that they had 0.12 plus 1 children enrolled in school in that household. Once this was done, and after trying different kinds of regression, we chose to do a regression among students and nonstudents, allocating expenditure only among those persons who were between 4 and 26 years old. The results proved to be erratic, but we suppose this could have been due to the lack of information about expenditure on public school students and to the low enrolment rates in private schools.

With respect to private housing expenditure (CFR), our profile comes from information given by the ECPF on imputed rent for owner-occupied housing. We used the

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<sup>8</sup> All profiles were smoothed using R with a span of 0.01.

equivalence scale proposed by the NTA to allocate household expenditure by age, which is the same as the one used for other consumption, as explained below.

Finally, the category “other private consumption” combines the remaining consumption categories. As a first step in allocating this category, we separated those items that are only consumed by adults, such as alcoholic drinks and tobacco, from those items that can be legally consumed by all household members.<sup>9</sup> For the rest of the items, we used the equivalence scale proposed by the NTA methodology and inspired in the allocation of consumption proposed by Deaton (1997).

We divided public consumption into three main categories: health, education, and other public expenses. We further divided information on public health consumption (CHG) into four items, three of which allow for an age allocation. Hospital utilization and specialist assistance, primary healthcare, and pharmaceutical products together represent more than 90 percent of total health expenditure—54 percent, 22 percent, and 15 percent, respectively. The rest is for general services and other general expenditure. The Ministry of Health and Consumption provides this information.

For the allocation of public expenditure by age we followed Ahn, García, and Herce (2005). In particular, we allocated hospital care expenditure by age, combining the estimated cost of the different diagnostic-related groups and the entry rates by age and sex with the methodology they used, these data being provided by the Ministry of Health and Consumption. Although the estimated cost of those groups represents only 50 percent of total

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<sup>9</sup> In Spain in 2000 beer and tobacco could be legally consumed beginning at age 16. We therefore divided household consumption of these items for all household members older than 16 years. Other alcoholic drinks we divided per capita among household members older than 18.

public health expenditure, we used the profile based on entry rates to allocate the other expenditure categories as well.

The other two categories, pharmaceutical expenditure and primary health care, needed to be retrieved from a health survey—the Encuesta Nacional de Salud, carried out by the Ministry of Health and Consumption in 1997. The information given by that survey is rather limited as it asks individuals only if they use these kinds of services, omitting questions on the number of units or visits or their cost. Nevertheless, this information allows the total expenditure on pharmaceuticals and on primary health care to be imputed by age.<sup>10</sup>

For the long-term care age profile we followed the methodology used by Costa and Patxot (2004 and 2005), Pickard et al. (2007) and Comas-Herrera et al. (2006). We estimated both dependency rates and service utilization rates by age and gender from a survey of older persons conducted in 1998 by the Centro de Investigaciones Sociológicas. This information, together with the cost of each type of service, allowed us to obtain an age profile for expenditures on long-term care. The services considered were residential care, home care, and day care.

With regard to public expenditures on education (CGH), the Ministry of Education and Culture publishes information about public expenditures on public and private schools by level of education. It also publishes information on the number of students enrolled by school type (private, state-subsidized, private, and public). In addition, the ministry has information about cost per enrolled university student. Hence, to allocate expenditure by age we proceeded in two steps. First, we calculated the public cost per student enrolled in public and in semi-private schools, including universities. Second, we obtained the age profile of public

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<sup>10</sup> As the Ministry of Health and Consumption reports information by five-year age groups, we smoothed the data, using a span of 0.01, excluding expenditure on newborns, which clearly should be higher.

consumption in education by multiplying this cost by the number of students, and then dividing the result by the total population in each age group.

Finally, we needed to calculate the simple per capita amount of “other” public consumption (CGX). To do that, we divided the aggregate public consumption, which was not allocated by age in the above-mentioned categories, among the total population.

Figure 1 presents the per capita age profiles we obtained for consumption. Private consumption is composed by health, education, private capital consumption and other consumption. The last one has the biggest share in private consumption and is calculated by an equivalence scale that assigns less consumption for children below 20 than adults. That’s why it can be seen a small private consumption for children. Which is a peculiar result is the onset of private consumption beginning at age 65. We would expect a continuity or a rise up, because these ages demand more consumption of health and other cares. Though, this could be explain because a big share of health consumption in Spain is still public and the care for the elderly is done inside the family.

[Figure 1 about here]

In the case of public consumption, not surprisingly children consume more education than other age groups and the elderly consume more health services and goods. There is a peak in health consumption during the first year of life due to birth-related services. It is noteworthy that health care expenditures grow smoothly with age, whereas education consumption is more concentrated at certain ages and falls drastically after age 20. This result contrasts with the finding that private education remains high until age 25. Moreover, values are higher for public than for private health and education consumption.

### **Labor Income (YL)**

There is no reliable information about individual income in the ECPF.<sup>11</sup> For this information we used the 2000 round of the EU Household Panel. This survey collects information about all kinds of income on an individual and household level, although it does not have any information about consumption. Following NTA methodology, we divided labor income into earnings (YLE) and self-employed income (YLS). For the former, we extracted earnings declared by individuals working as employees, calculating the mean by age. For the latter, NTA methodology recommends using—both for the aggregate value and for individual profile—two-thirds of declared self-employed earnings, as it is assumed that one-third of the earnings are due to capital, and not to labor.

Figure 2, which shows the labor income age profile, including both earnings and self-employment income, indicates that the earnings profile starts at age 14 and rises quickly with age. The peak of earnings is at age 43. Self-employment income starts at 20 and rises slowly with age, having its peak at 58. Both age profiles end at 70. That may be due to Spain's legislation on retirement, which prohibits receiving a retirement benefit while continuing to work. It should also be noted that the share of self-employment income in total labor income is higher in Spain (17 percent for ages 30-50) than in northern and central European countries, where it is usually less than 10 percent.

[Figure 2 about here]

The lifecycle deficit resulting from the consumption and labor income profiles obtained above is shown in Figure 3. The LCD indicates how much of total consumption is financed by labor income. If the LCD is negative, this means that the age group has a surplus of labor income and can transfer or lend this excess to other ages that have a deficit of labor

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<sup>11</sup> The only information in the ECPF on income is total household labor income, which seems to be seriously underreported.

income. As expected, we see a surplus for working-age adults and a deficit for dependent age groups—children and the elderly. The LCD is greater among the elderly than among children. The surplus starts at age 27 and ends at age 57, spanning a period of 30 years. In other words, for 30 years people in Spain earn more income than they consume.

[Figure 3 about here]

### **Net public transfers (TG)**

Public transfers are composed of in-kind and cash transfers. The former show the same age profile as public consumption in education, health, and other public consumption, as explained above. We divided cash transfers into several items, following Abío et al. (2005), as explained below.

#### *Public transfers received*

In Spain there are several kinds of social benefit. Some of them are contributory—that is, based on past contributions to the government from individuals — and others are not. Among the contributory Social Security benefits, we considered all types of contributory pensions and unemployment benefits. Profiles of average pension receipts classified by age and sex are available for 2000 from administrative data compiled by the Ministry of Work and Social Affairs for various pension categories (retirement, disability, and survivors, including widows, orphans, and other economically dependent relatives). Similarly, we used data provided by the Instituto Nacional de Empleo (INEM) on average monthly gross unemployment income by age and sex in 2000 to construct profiles of persons receiving unemployment benefits. With respect to maternity benefits, given the absence of information about recipients by age, our imputation procedure relied on observed age-specific fertility

rates.<sup>12</sup> Similarly, as direct evidence on sickness benefits was unavailable, we assigned transfers using age-related data on industrial accidents during the working day and the average period of discharge reported in 2002 by the Ministry of Work and Social Affairs.

Finally, child benefits combine contributory and noncontributory payments. We imputed them using the total amount given to those below and above 18 years of age, the latter groups consisting of handicapped persons.

For other noncontributory transfers, we considered the number of beneficiaries by age and sex, the monthly uniform insurance amount for each type of benefit (taken from 2002 data compiled by the Ministry of Work and Social Affairs), and the underlying population structure, to derive age profiles for noncontributory old-age and disability pensions. Again, as information is reported by five-year age groups, we smoothed the data.

Figure 4 shows the age profiles obtained for public cash inflows by category. Retirement benefits are clearly the most important, going to people over age 55, and especially to those over 65. Survivor pensions are the second source of public transfers for people over 60, and we can see a pattern of substitution among retirement and survivor pensions, due mainly to the fact that, on average, men die before their wives, who then start receiving a survivor's pension. Unemployment and disability benefits are received by working-age individuals. Other types of public benefits, such as noncontributory pensions, family aid, or maternity benefits, are not salient in the Spanish system.

[Figure 4 about here]

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<sup>12</sup> We followed the standard NTA assumption. Alternatively, one could consider newborns as the ultimate beneficiaries.



*Public taxes paid*

In the case of outflows to the government, the control aggregates are the aggregate values from National Accounts published by the INE, which are more detailed than those of the Government Finance Statistics (GFS) elaborated by the International Monetary Fund (IMF). (There is no complete information on public taxes paid by tax payers' ages for Spain in the System of National Accounts of United Nations (SNA). We extracted the age profiles from either the ECPF or the EU Household Panel, as explained below.

For the valued-added tax, we based the allocation procedure on the consumption profiles extracted from the ECPF. In particular, we separated those items that had both an identifiable separate aggregate profile and an individual-level age profile. This was possible for excise taxes (on tobacco, beer, other alcoholic drinks, and petroleum).

Our personal income tax profiles came from Abío et al. (2005), who aimed at reproducing the 1998 individual personal income tax return using data from the EU Household Panel. First, we converted net wage earnings, as well as pension and unemployment benefits (which are taxed like personal labor income in Spain) into gross terms by considering the respective income retention and the corresponding worker Social Security contribution rates. Next, we determined disposable income by applying the appropriate allowable expenses. Then, adding up disposable income from different sources, we inferred the total tax liability for each taxpayer from the tax rate schedule. We derived the tax finally paid after accounting for tax allowances related to rent, health care, dependent relatives and children, and mortgage principal and interest (all imputed to the head of the household), and labor earnings.

The remaining taxes we derived from some of the other profiles described. Social Security contributions were obtained by using the labor income age profile, given that the contribution rate is almost proportional, except for those affected by the upper and lower

thresholds. For the other taxes and transfers we used age profiles of labor income, consumption, or asset income, depending on where taxes were imposed. For the rest of the world transfers, we calculated the net transfers and applied the total taxpayers' profiles.

Figure 5 shows the per capita profiles obtained for the various taxes. As expected, they are concentrated in working ages, when individuals contribute to the Social Security System and have assets and labor income.

[Figure 5 about here]

### **Net private transfers (TF)**

We decomposed private transfers into those occurring within and between households. Following NTA standards, we first estimated interhousehold transfers, as they are necessary for estimating intrahousehold transfers. For this we turned to the EU Household Panel, the sole source for information on inflows, and to the ECPF, the sole source for information on outflows.

With respect to estimating intrahousehold transfers, the available data constrain their estimation in Spain to a greater extent than elsewhere in Europe, as for this purpose it is crucial to have a single survey that provides both income and consumption data as established in the standard NTA method. We therefore combined consumption information from ECPF with income information from EU Household Panel in the following way. Our reference survey was the EU Household Panel, which contains income and public inflows for each member of the household, while consumption data comes from the ECPF.<sup>13</sup>

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<sup>13</sup> As a consequence we also decided to use all variables needed from the European Household Panel to avoid further distortions. In particular, taxes paid and public cash transfer inflows were taken from the microdata set, even though the latter are mostly imputed to the head of the household. The alternative would have been to use the estimated age profiles, but this could eliminate variability and hence produce unreliable results.

The imputation procedure entailed two steps. First, we computed “average imputed consumption” to each household member using the average estimated profile. We also imputed “average income” in the same way to each member of the household in order to use the resulting total imputed household income as a household-specific scaling factor. Second, we revaluated consumption using the above-mentioned scaling factor—i.e., the ratio of observed total household income to “imputed average total household income.” As a result of this procedure, it was possible to apply the standard NTA method to obtain the age profile of intrahousehold transfers.<sup>14</sup>

As can be seen in Figure 6, which shows the estimated age profiles of intrahousehold transfers, the only net recipients of family transfers are children and people younger than 28. The elderly, especially those over age 80, give more transfers to other family members than they receive, despite not having labor income. This negative net transfer flow for the elderly can possibly be explained by the fact that elderly household arrangements in Spain present a high share of cohabitation (40 percent of individuals of 65 years or over lived with two or more other people in the early 1990s, according to Kinsella and Valkoff 2001:67) as compared with other European countries.

[Figure 6 about here]

### **Asset-based reallocations (ABR)**

The computation of asset-based reallocations requires as an input an age profile for private capital income, while the profile for savings is then obtained as a residual. Nevertheless, the whole ABR profile can also be obtained as a residual of the lifecycle surplus/deficit profile (LCD) and the transfer profiles (both public and private, TG and TF, respectively) provided

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<sup>14</sup> A similar process was used to impute the average profile of interhousehold transfer outflows to the EU Household Panel data, as information on this item was available only for inflows.

that these are already available. In the present study we have taken this approach. Our results are presented below.

### **National Transfer Accounts**

Figure 7 shows the complete National Transfer Accounts obtained for Spain. It plots the lifecycle deficit together with the three possible ways of reallocating resources between age groups: public transfers (TG), private transfers (TF), or asset-based reallocations (ABR). The figure is quite illustrative. First, as seen above, the LCD is positive until age 27, when there begins to be a deficit as individual consumption exceeds labor income. It becomes positive again after age 57. The LCD is negative—implying a surplus—from age 27 to age 57. Second, as a consequence of this dependence, the young and the old receive net transfers from the government (TG is positive), whereas they contribute (TG becomes negative) during the productive ages. Nevertheless, the cutting ages for LCD and TG are quite different, owing to the role of the other age-allocation devices—i.e., asset-based reallocations (ABR) and private transfers (TF).

[Figure 7 about here]

If we consider strictly lifecycle savings, the natural age shape of ABR is at first negative, as there are no assets or asset income, while savings start being positive. Later, as wealth increases and asset income starts being positive, ABR can continue being negative as long as savings exceed asset income—meaning that a share of labor income is used to save—or ABR can be nil if all asset income is saved. The absence of a negative initial ABR can be due either to a bequest received that generates  $Y_a$  higher than  $S$  or to the fact that adults become indebted to finance their consumption and transfers to their children. Intergenerational transfers can interact in many more ways as, together with bequests, intervivos transfers can occur from grandparents to children or grandchildren, or from children to parents. In our case, the ABR is for the moment obtained as a residual; hence we

cannot be sure about the reason for the monotonically increasing shape of ABR. Probably the coresident elderly play a role, as suggested by the positive transfers given by the elderly shown in the TF profile.

Finally, Figure 8 summarizes the role of each reallocation device in financing the lifecycle deficit of the young and the old. During childhood, private family transfers are the main source of consumption, representing 69 percent of the total lifecycle deficit at these ages. Public transfers, mainly in the form of health and education services for children, represent 32 percent of the lifecycle deficit, and asset-based reallocation is practically nonexistent. However, asset-based reallocation is the main source of financing for the lifecycle deficit of the elderly, representing two-thirds of it. Public transfers are the second source of finance, amounting to 41 percent, whereas private transfers are negative; that is, the elderly make more transfers than they receive.

[Figure 8 about here]

### **Concluding Remarks**

The estimation of NTA for Spa in in 2000 leads to several interesting conclusions. First of all, we find that the cross-sectional labor income profile has the typical inverted-U shape. Hence, labor income is the main source of maintenance for individuals between ages 16 and 70. In particular, for ages 27–57 labor income is higher than consumption expenditure, and so it allows for a surplus in the difference between labor income and consumption. This surplus is in part transferred to the government in the form of taxes, while the rest can be transferred to other family members or saved. In contrast, individuals younger than 27 and older than 57 are, to some extent, economically dependent. That is, they cannot finance their consumption with only labor income. Nevertheless, the characteristics of younger and the older age groups are quite different.

On the one hand, during childhood and youth, individual consumption is financed mainly by private transfers from the adult members of the family. The private transfers received are highest for individuals of ages 13–18. Public transfers are substantially less important, and they are mainly in-kind, through education and health systems, because in 2000 direct aids to families had not been developed.

On the other hand, older people finance their lifecycle deficit mainly through asset-based reallocations. In fact, the asset-based reallocation age profile is practically zero until age 20; but it grows continuously afterward, showing no decrease at the end. Public transfers are also a major source of support to the elderly, because the cash public transfers especially benefit older people through the retirement and survivor pension system. Besides, the elderly are the main beneficiaries of substantial in-kind transfers, such as health care and long-term care. Nevertheless, we find that the elderly are net payers of private transfers, implying that they transfer money or housing services to the young members of their families. As mentioned before, this surprising result could be due to the high proportion of people 65 years old or older who live in households with more than two people and are usually the homeowners. This is surprising, as we have pointed out in the introduction, given that the living standard of people aged 65 and older is only about 78 percent of that of the population aged 0–64, and their risk of poverty is more than 25 percent.

At the same time, we observe that all individuals older than 16 both pay and receive private transfers. Although the balance is always negative from age 28 on, when they pay more than they receive, it seems clear that private support tends to be mutual. This is a typical situation in Latin American countries, indicating that Spain lies halfway between the northern European countries and Latin America in this regard.

Figure 1 Per capita profiles of consumption, Spain (2000)

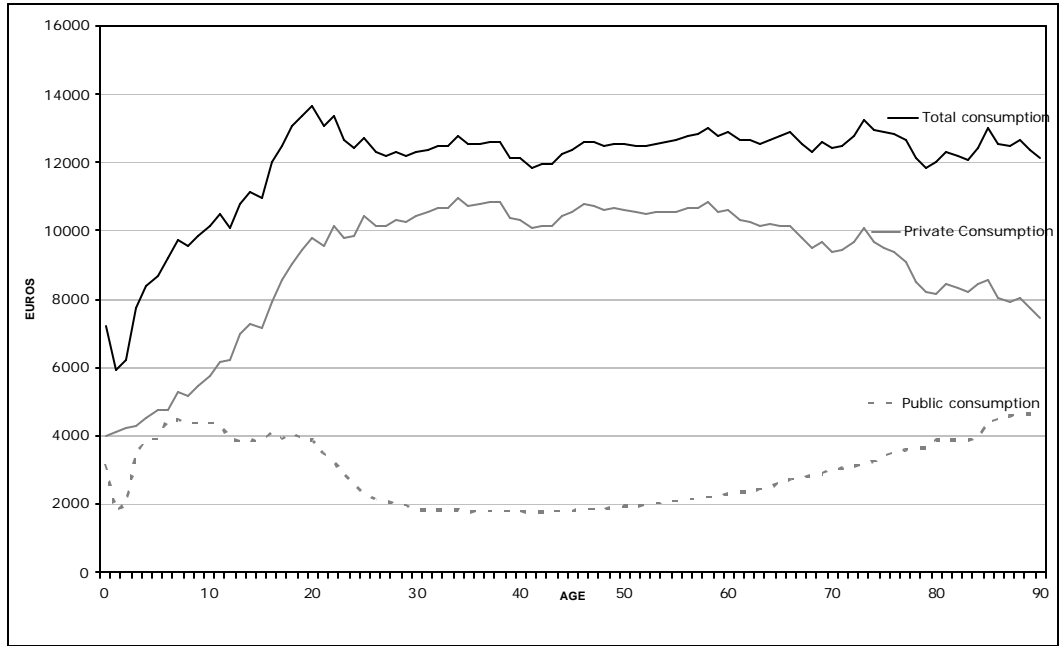


Figure 2 Per capita profiles of labor income, Spain (2000)

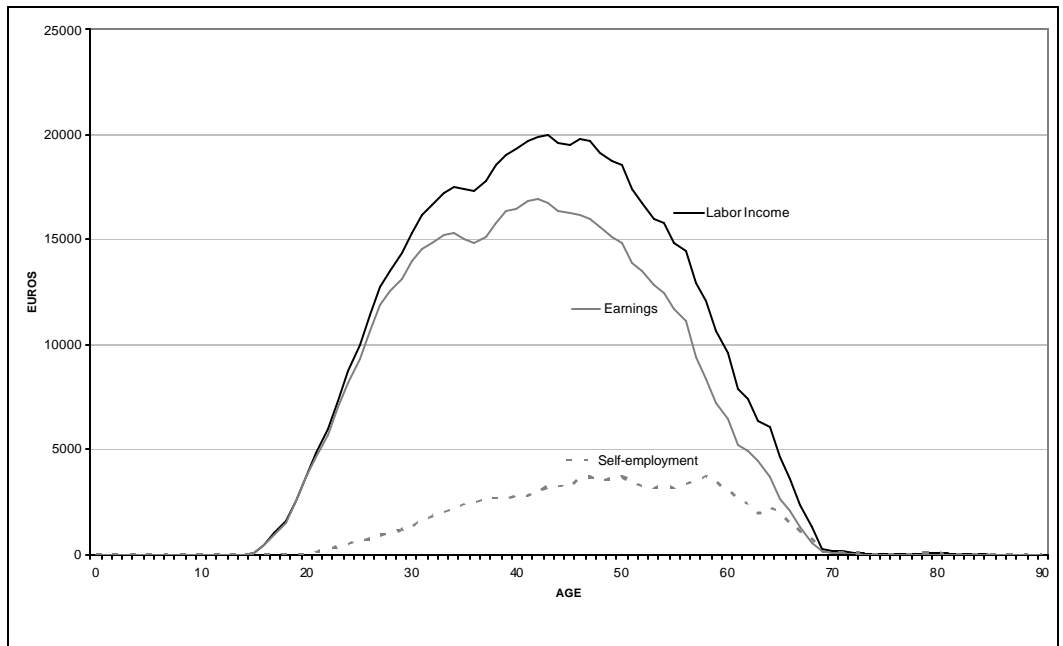


Figure 3 Per capita Lifecycle Deficit, Spain (2000)

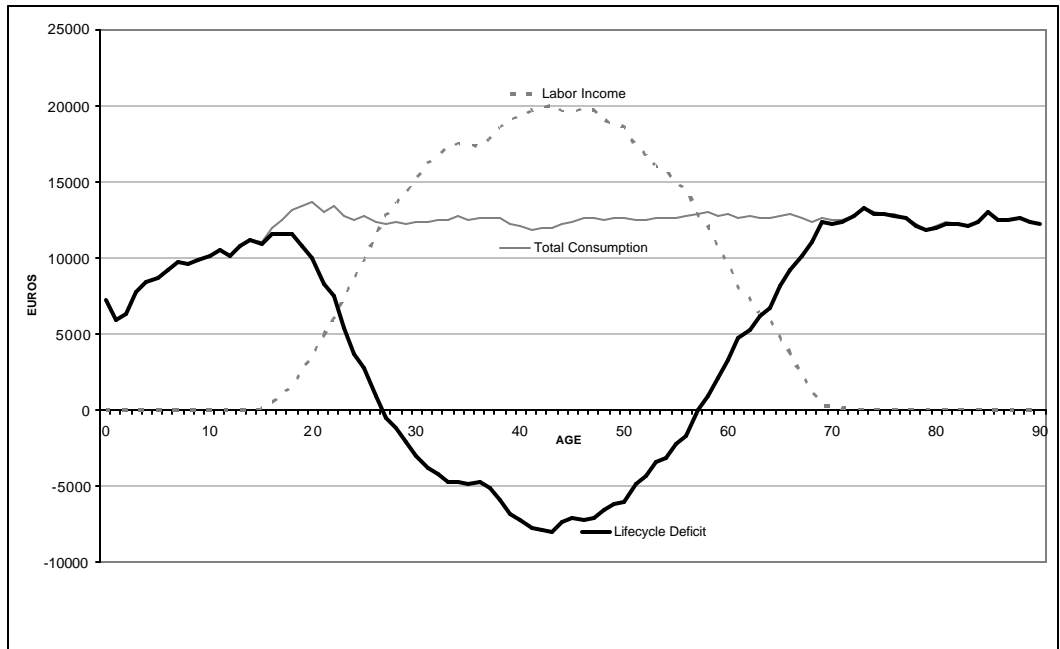


Figure 4 Per capita public cash inflows (transfers), Spain (2000)

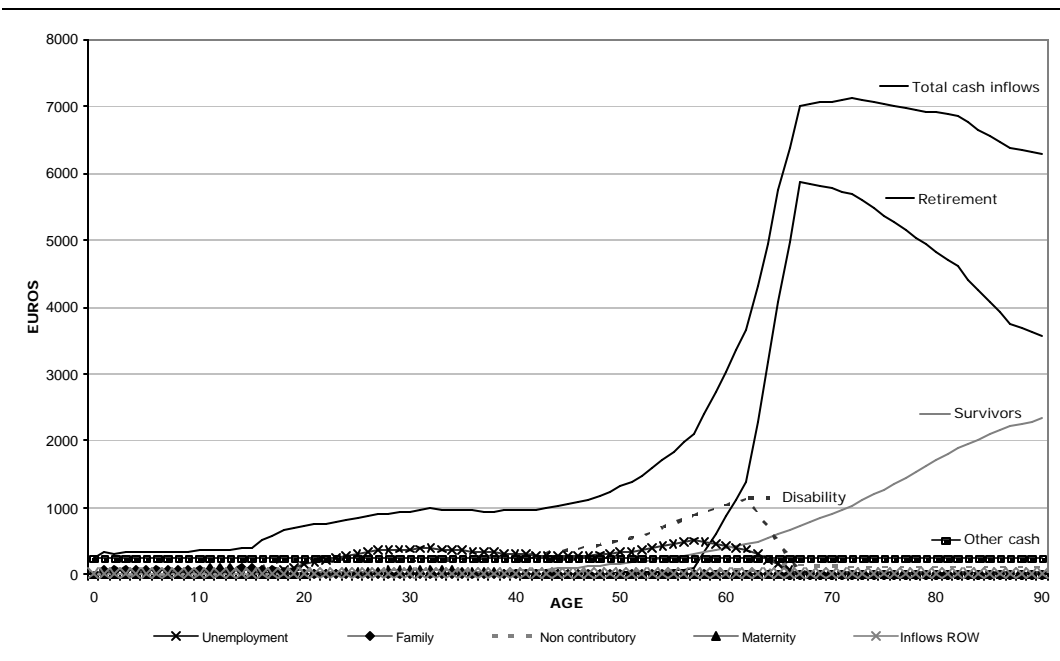




Figure 5 Per capita public transfer outflows (taxes), Spain (2000)

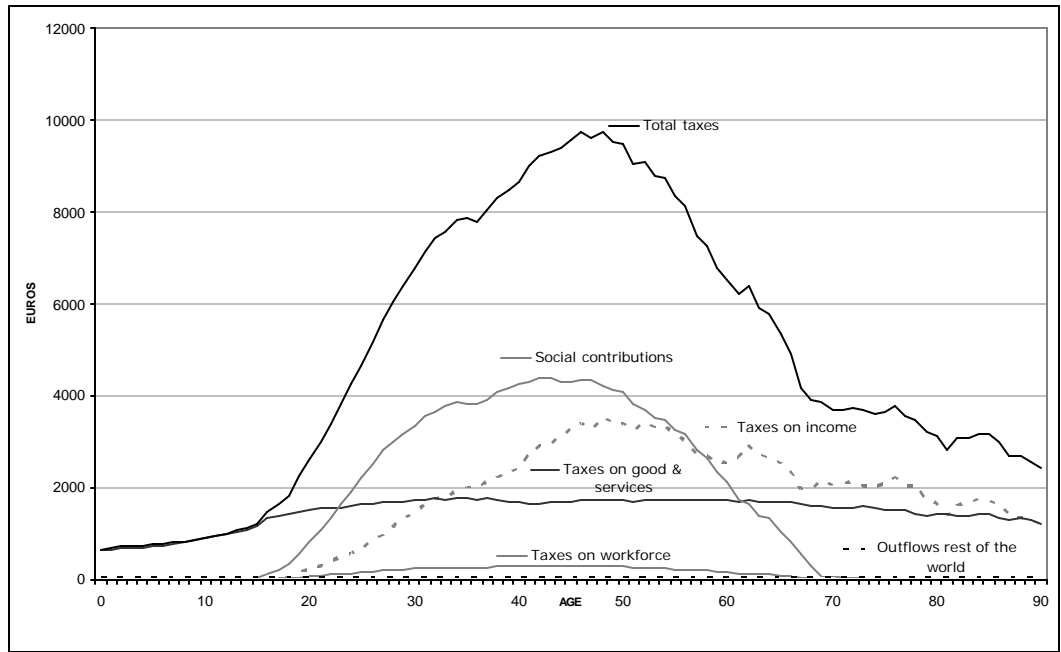


Figure 6 Per capita intra-household transfers, Spain (2000)

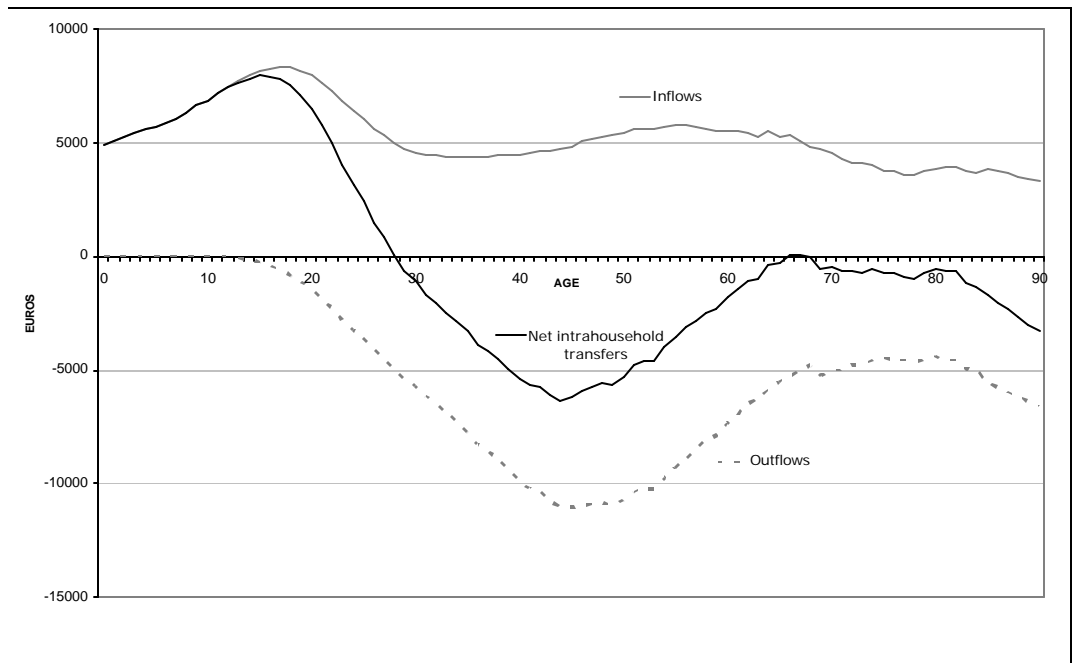


Figure 7 Per capita National Transfer Accounts, Spain (2000)

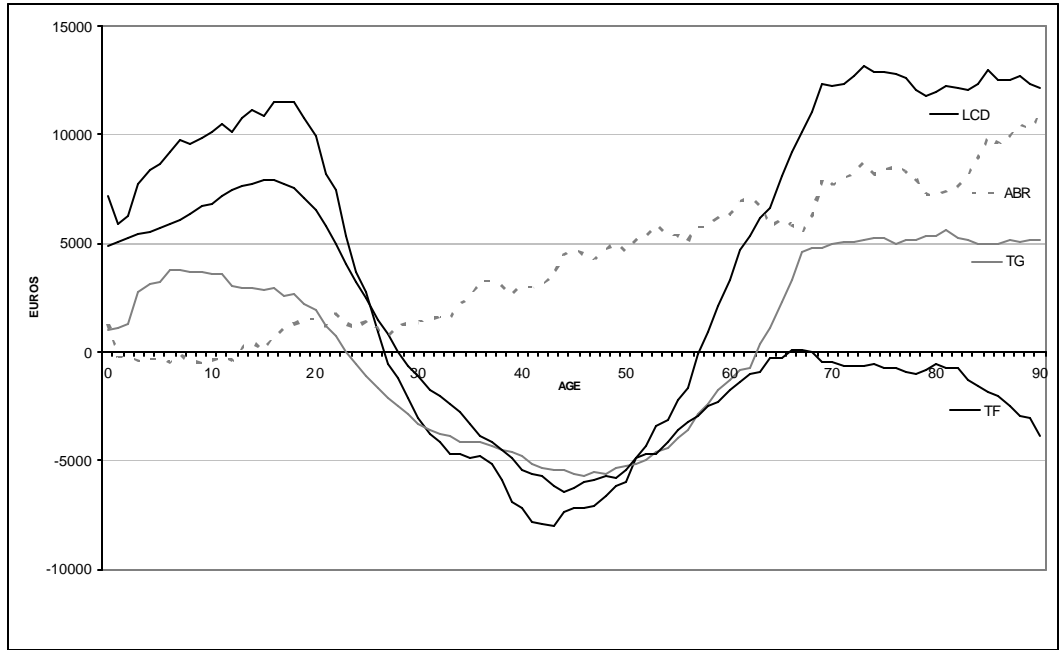
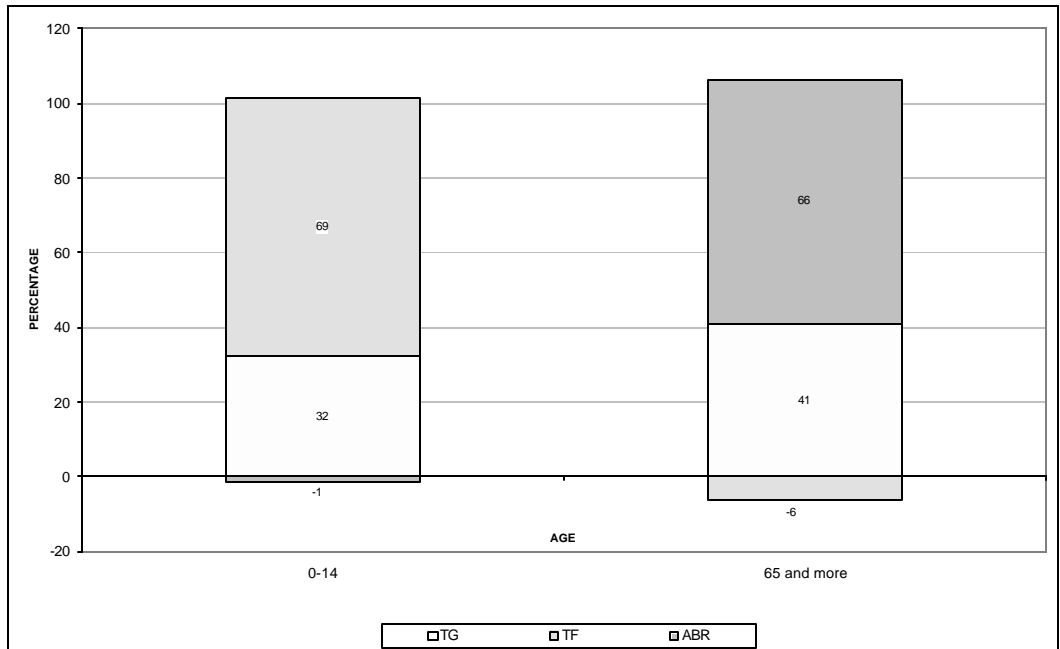


Figure 8 Financing the Lifecycle Deficit in Spain (2000)



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### **Annex. Statistical Sources for Macro Aggregates and Age Profiles**

CIS (Centro de Investigaciones Sociológicas [Center for Sociological Research]): Encuesta sobre la Soledad de las Personas Mayores, 1998

Eurostat (Web site maintained by the European Commission): Panel de Hogares de la Unión Europea [EU Household Panel], 2000.

IGAE (Intervención General de la Administración del Estado): Cuentas de las Administraciones Públicas, 2003

INE (Instituto Nacional de Estadística [National Institute of Statistics]):  
 Contabilidad Nacional de España, 2000  
 Encuesta Continua de Presupuestos Familiares (ECPF), 2000  
 Estadística de la Enseñanza Superior en España, curso 1999–2000

MEC (Ministerio de Ciencia y Tecnología [Ministry of Science and Technology]):  
 Estadística de Enseñanzas no Universitarias, curso 1999–2000  
 Estadística del Gasto Público en Educación, 2000

MEH (Ministerio de Hacienda [Ministry of Finance]): Presupuestos Generales del Estado, 2000

MSC (Ministerio of Sanidad y Consumo [Ministry of Health and Consumption]):  
 Encuesta Nacional de Salud, 1997  
 Estadística del Gasto Sanitario Público, 2000

MTAS (Ministerio de Trabajo y Asuntos Sociales [Ministry of work and Social Affairs]):  
 Anuario de Estadísticas Laborales y Asuntos Sociales, 2000  
 Informe Estadístico del Instituto Nacional de la Seguridad Social (INSS), 2000

Table 1

Age profiles	Data source
<b>Economic lifecycle deficit</b>	
Private consumption	
Private health consumption (CF)	INE: ECPF, 2000
Private education (CFH)	INE: ECPF, 2000
Private housing (CFR)	INE: ECPF, 2000
Other private consumption (CFX)	INE: ECPF, 2000
Public consumption	
Public health consumption (CG)	MSC: Estadística del Gasto Sanitario Público, 2002 MSC: Encuesta Nacional de Salud, 1997
Public education (CGH)	MEC: Estadística de Enseñanzas no Universitarias MEC: Estadística del Gasto Público en Educación INE: Estadística de la Enseñanza Superior en España
Other public consumption (CGX)	Per capita
Labour Income (YL)	Eurostat: EU Household Panel, 2000
Self-employed (YLS)	Eurostat: EU Household Panel, 2000
Earnings (YLE)	Eurostat: EU Household Panel, 2000
<b>Tax</b>	
Social Security contributions	Eurostat: EU Household Panel, 2000
Personal income tax	Eurostat: EU Household Panel, 1998
Capital tax	Eurostat: EU Household Panel, 2000
Value-added tax (VAT)	INE: ECPF, 2000
Property tax	INE: ECPF, 2000
Excise taxes (except tobacco)	INE: ECPF, 2000
Excise tax on tobacco	INE: ECPF, 2000
<b>Net public transfers</b>	
Contributory pensions (retirement, disability, widowhood, survivors)	MTAS: Informe Estadístico del INSS, 2000
Noncontributory pensions (retirement, disability); unemployment and temporary disability benefits	MTAS: Anuario de Estadísticas Laborales y Asuntos Sociales, 2000
Social Security family benefits	MTAS: Informe Estadístico del INSS, 2000
Health benefits (hospital and primary care, pharmaceuticals)	MSC: Encuesta Nacional de Salud, 1997
Education expenditure	MEC: Estadística de Enseñanzas no Universitarias; MEC: Estadística del Gasto Público en Educación; INE: Estadística de la Enseñanza Superior en España
Long-term care	CIS: Encuesta sobre la soledad de las personas mayores, 1998
<b>Private transfers</b>	
Interhousehold transfers (inflows)	Eurostat: EU Household Panel, 2000
Interhousehold transfers (outflows)	INE: ECPF, 2000
Intrahousehold transfers (in/outflows)	Eurostat: EU Household Panel, 2000 INE: ECPF, 2000