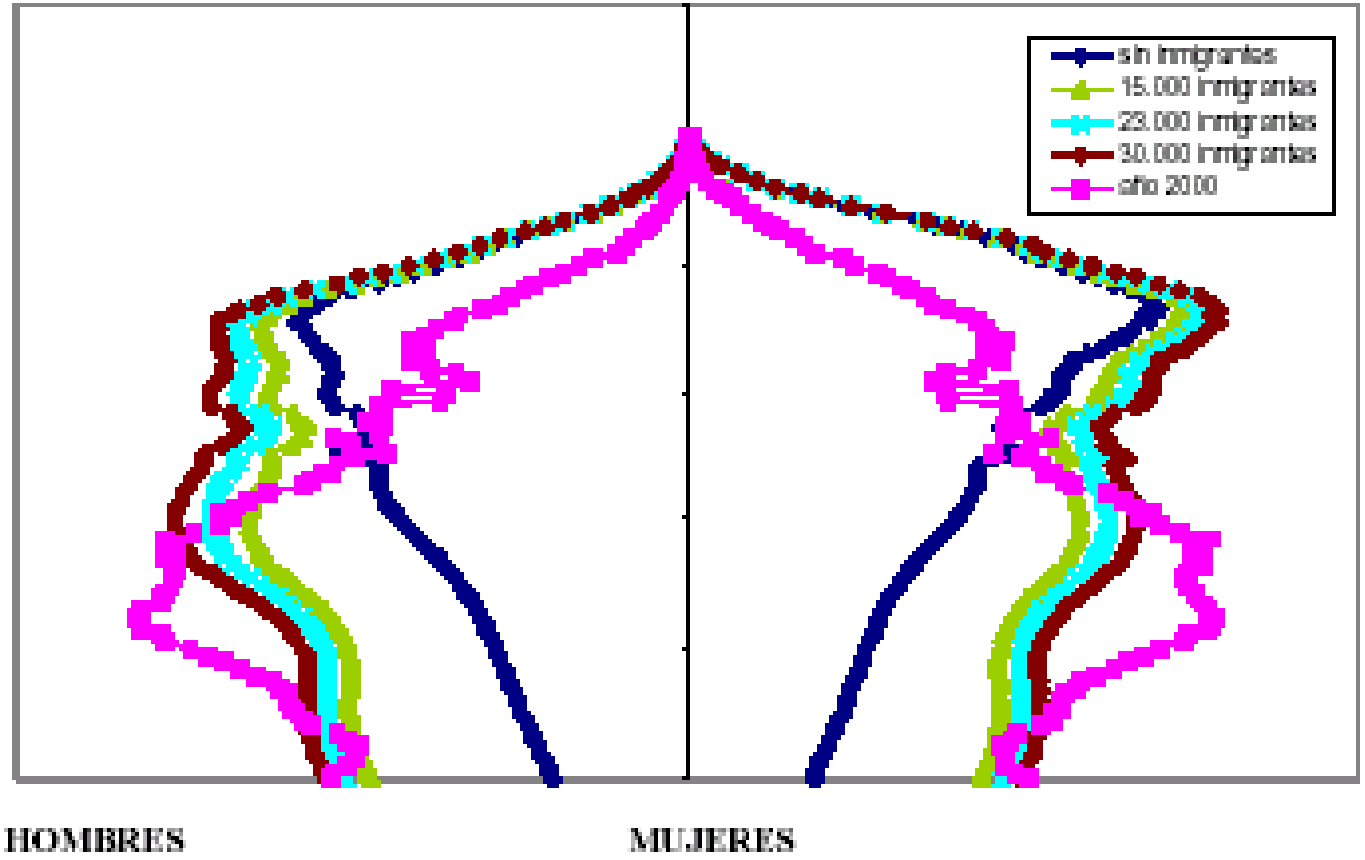
THE IMPACT OF DEMOGRAPHIC CHANGES

IN THE ECONOMIC AND SOCIAL POLICY

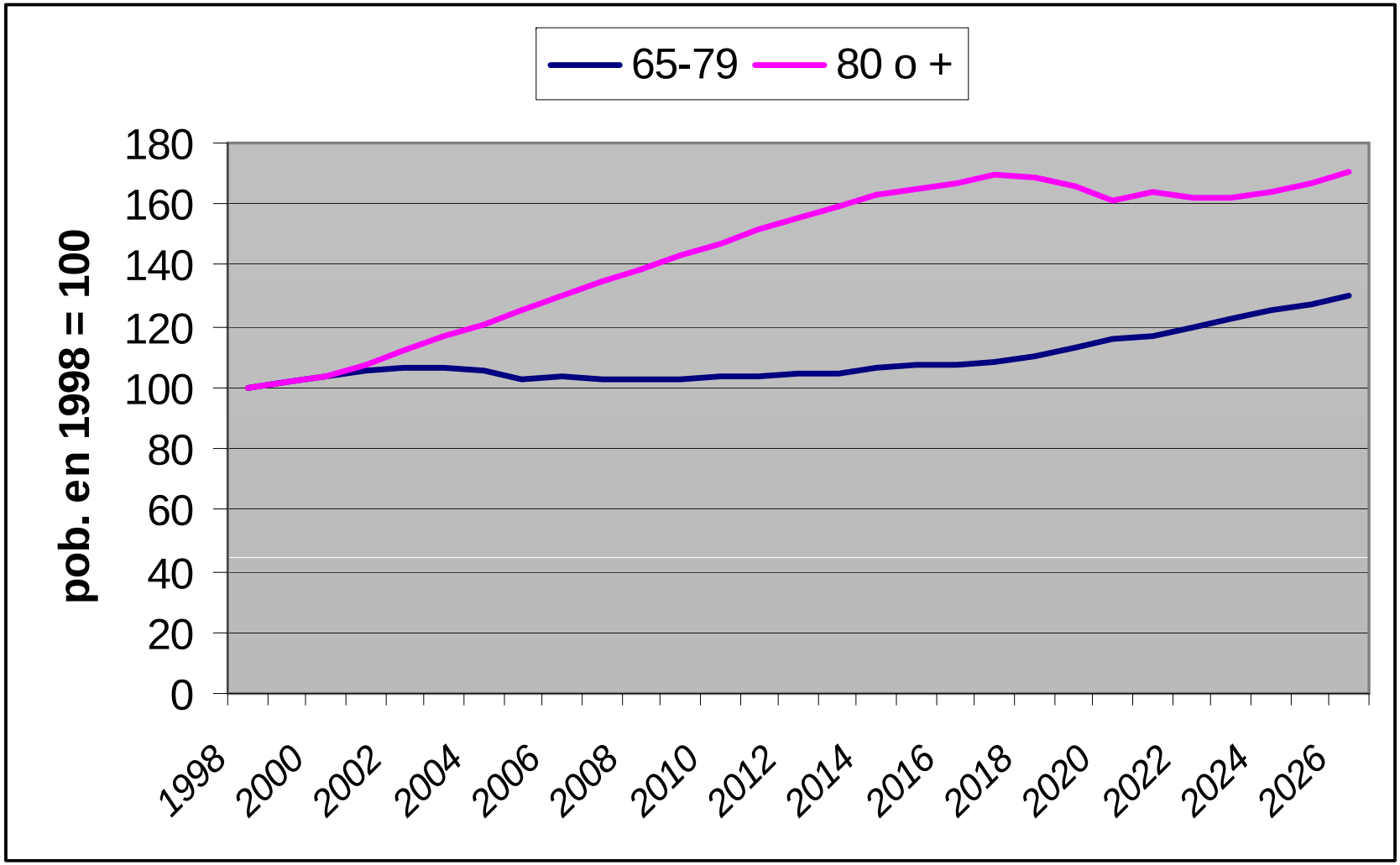
STATE OF THE QUESTION: THE DYNAMICS OF THE AGE DISTRIBUTION The case of Andalusia (Source FEDEA, 2007)

Figura 2: Pirámide de población andaluza con fecundidad media en 2050

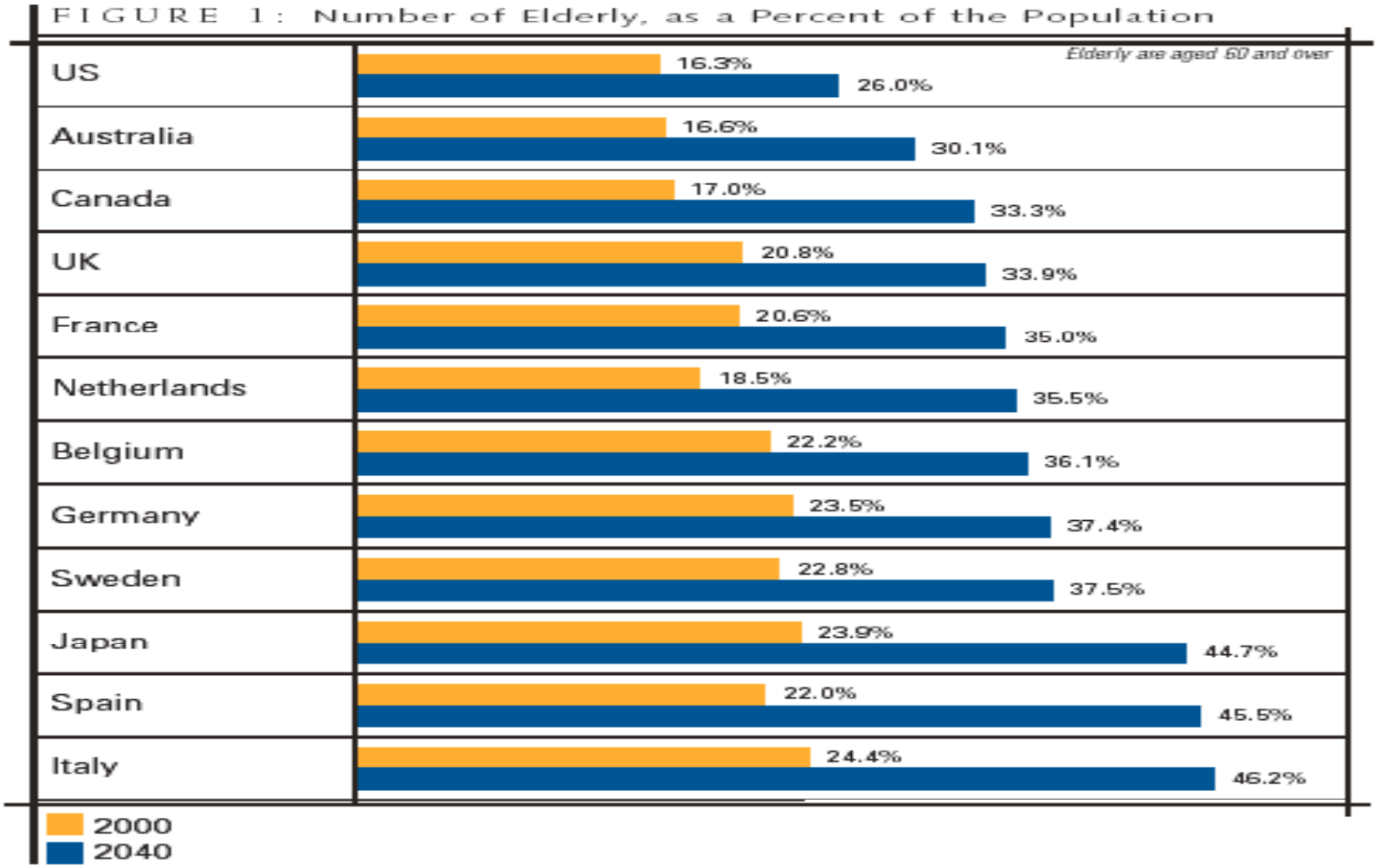
(distintos flujos netos de inmigrantes, fecundidad media)



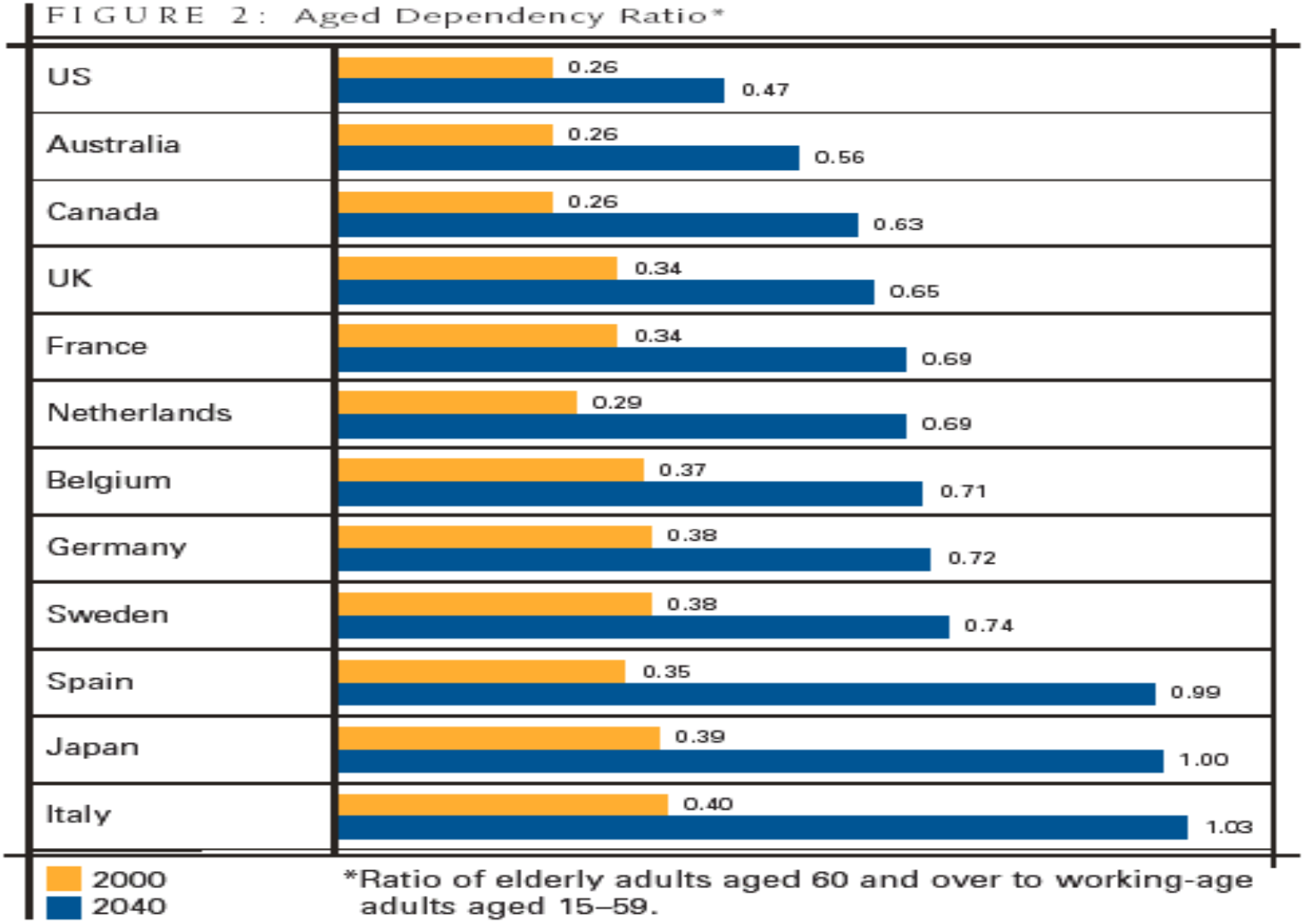
STATE OF THE QUESTION: Relative growth of the elderly population in Spain :1998-2026.



STATE OF THE QUESTION: Relative growth of the population over 60 years of age in Spain: 2000 to 2040. Source: www.csis.org/media/csis/pubs/ageing_index.pdf



STATE OF THE QUESTION: DEPENDENCE RATE (about 60 / 15-59)
Source: www.csis.org/media/csis/pubs/ageing_index.pdf



General effects of the demographic change on the economic policy

- On productivity (?): GDP growth, per capita income, salary per employee (education, job opportunities, technical change…). Intergenerational impact.

- Income/ Asset composition: Investment and liquidation of assets over the life cycle

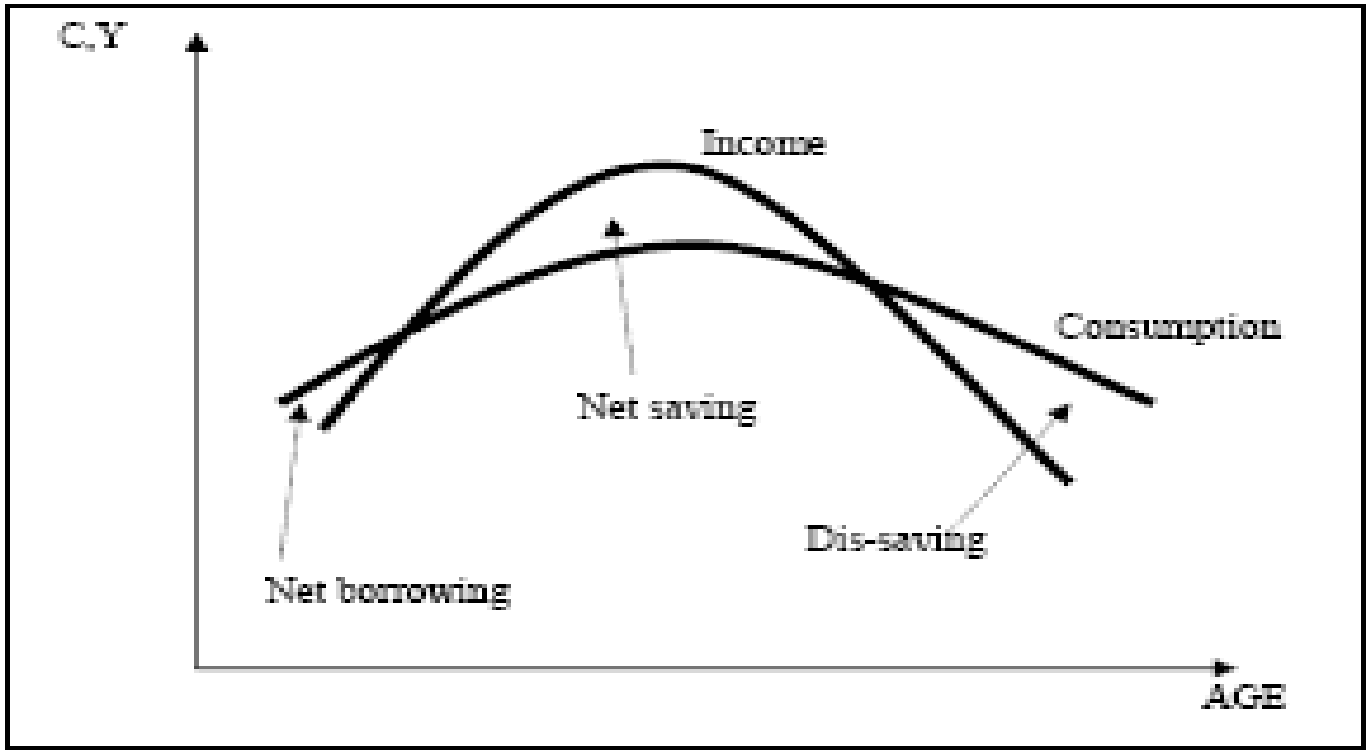
- Balance between consumption and saving

General effects of the demographic change on the economic policy

- Components of consumption, durable/ non-durable housing, transportation, personal services ...
- Mix of public / private consumption and role of the social networks
- Savings, capital formation and external money transfers

THE EVIDENCE: INCOME, CONSUMPTION, DEBTS Y SAVINGS AND OVER THE VITAL CYCLE OF INDIVIDUALS. EXPECTED PERFORMANCE

Figure 3.2 Consumption smoothing over the life cycle: an illustration



THE EVIDENCE: CHANGES EXPECTED IN THE STRUCTURE OF CONSUMPTION BY 2005-2050 SPAIN AS A UNIT AND BY PARTS

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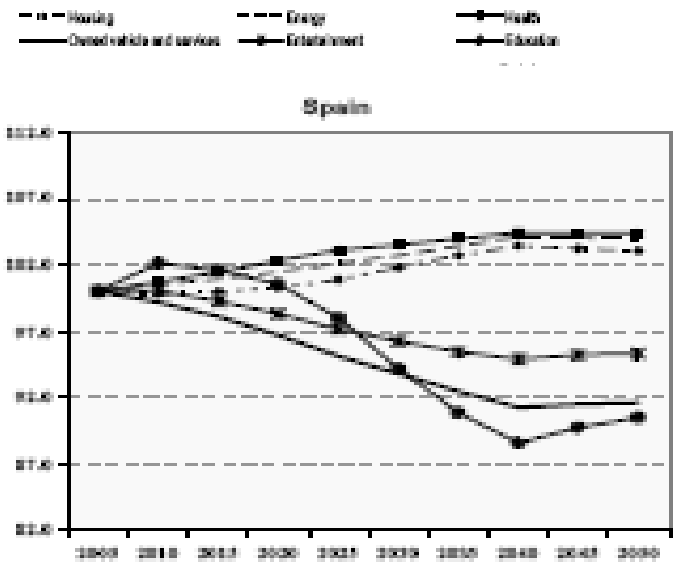
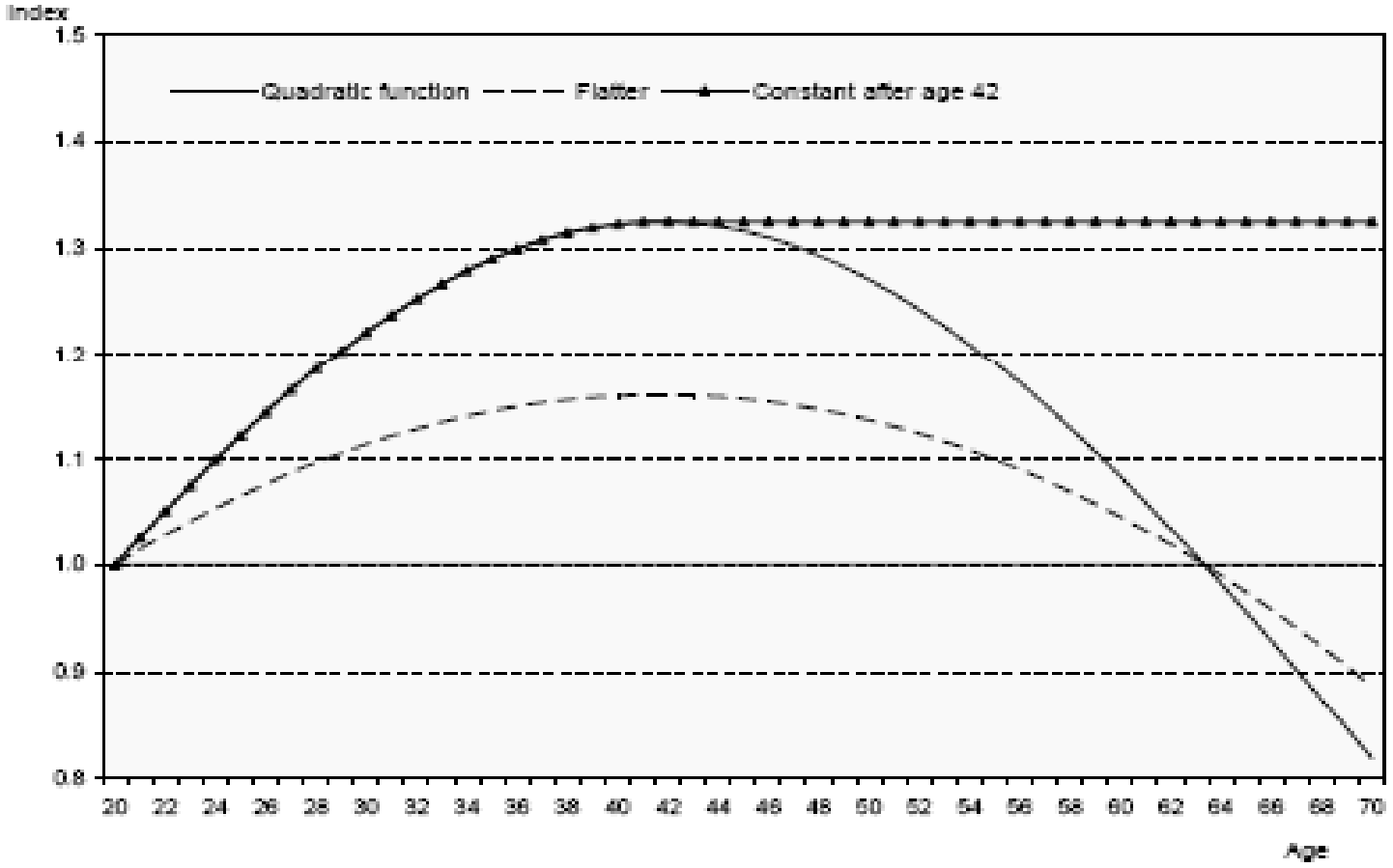
Figure 3.5 Relative changes in consumption structure, 2005-2050



THE EVIDENCE: PROFILES OF AGE AND PRODUCTIVITY FROM OECD COUNTRIES WITH INFORMATION AVAILABLE (FRANCE AND GERMANY MAINLY)

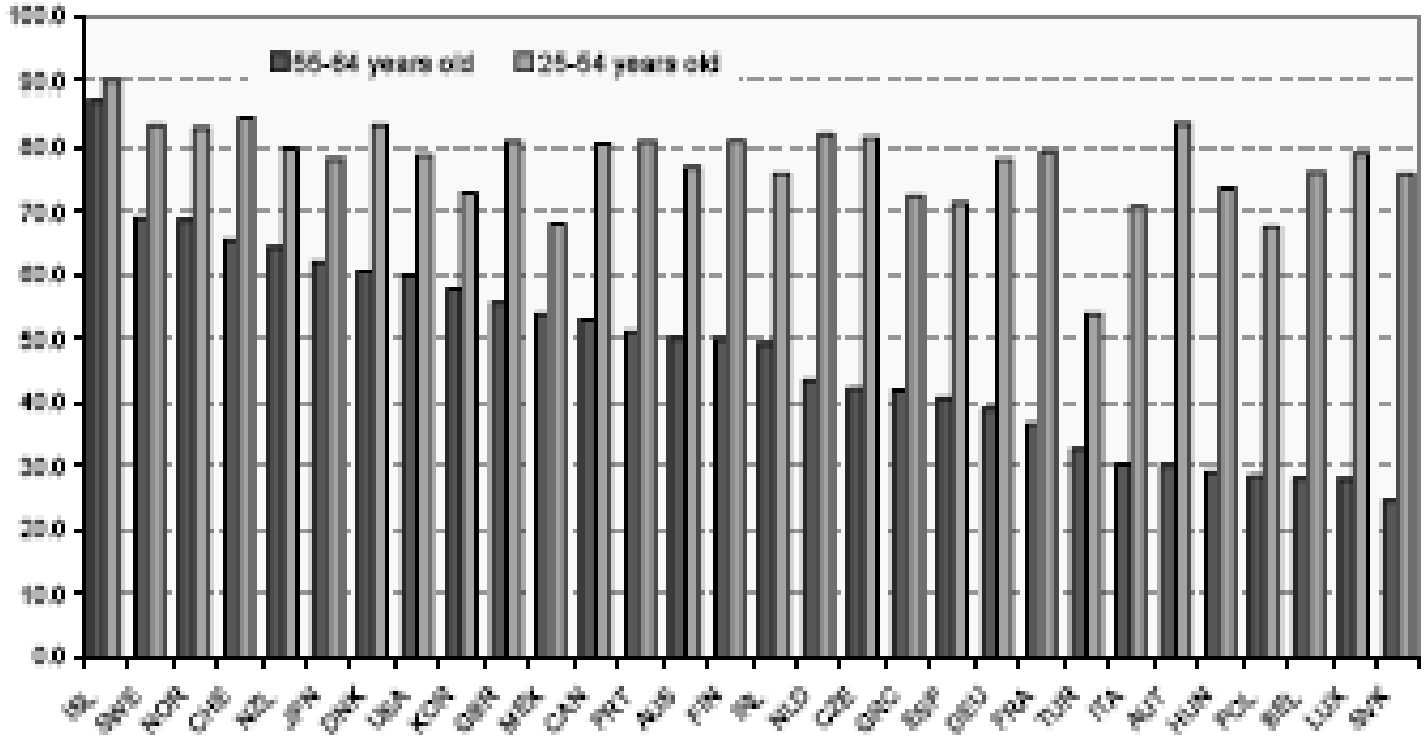
Figure 5.2 Different age-productivity profiles



Source : OECD calculations.

THE EVIDENCE:OCCUPANCY RATES BY AGE AND COUNTRIES

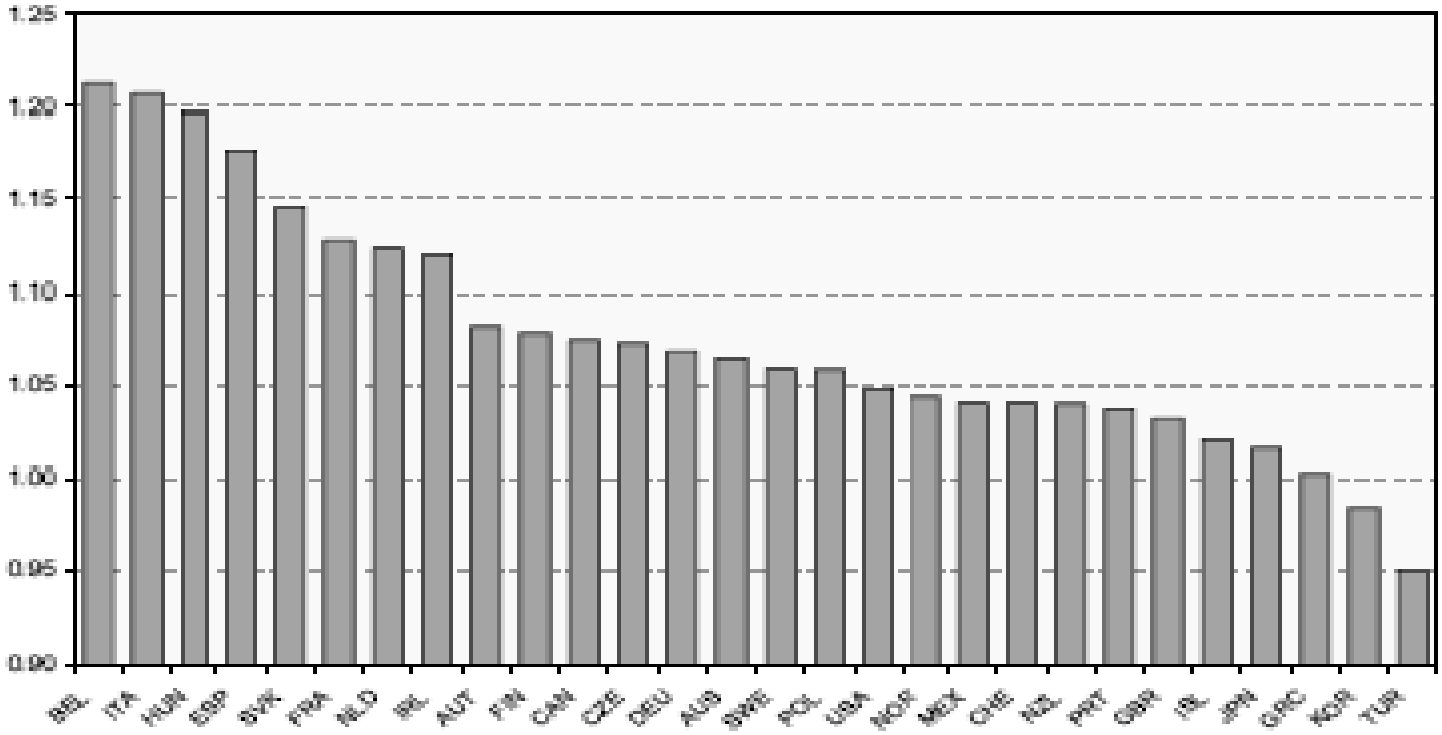
Figure 5.7. Employment ratios by age groups across OECD countries
Latest available year (2003 or 2002)



Source: OECD Labour Force Statistics.

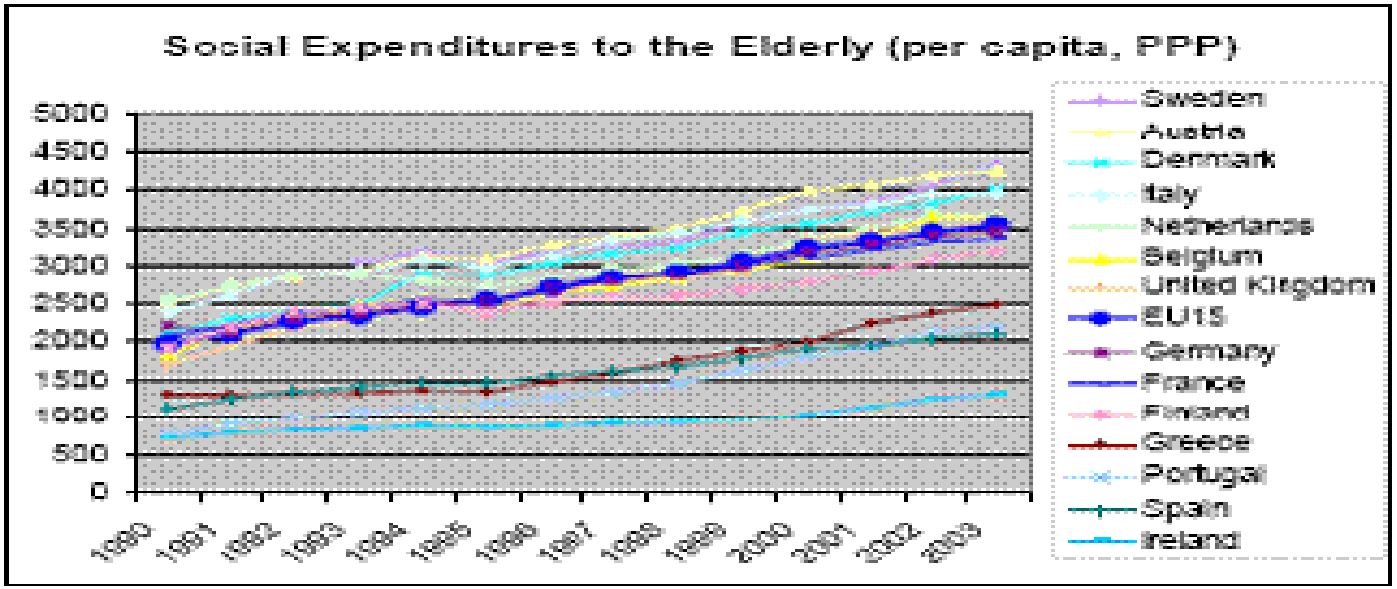
THE EVIDENCE: EDUCATION AND AGE COHORT (55-64 YEARS) (2000)

Figure 5.8 Relative level of education of employed workers 55-64 years of age[1], 2000



1. Ratio between the average education level of employed workers 55-64 years old and the average level of education of the population in the same age group.
Source: OECD Education database.

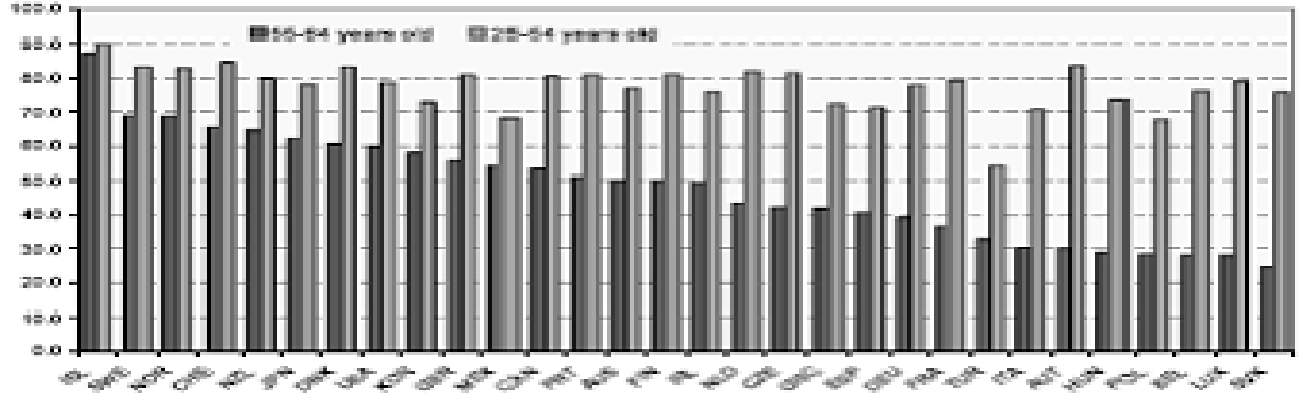
Figure 6: Social Expenditures Dedicated to the Elderly (per capita, in Euro PPP)



Source: Eurostat Data Archive 2005

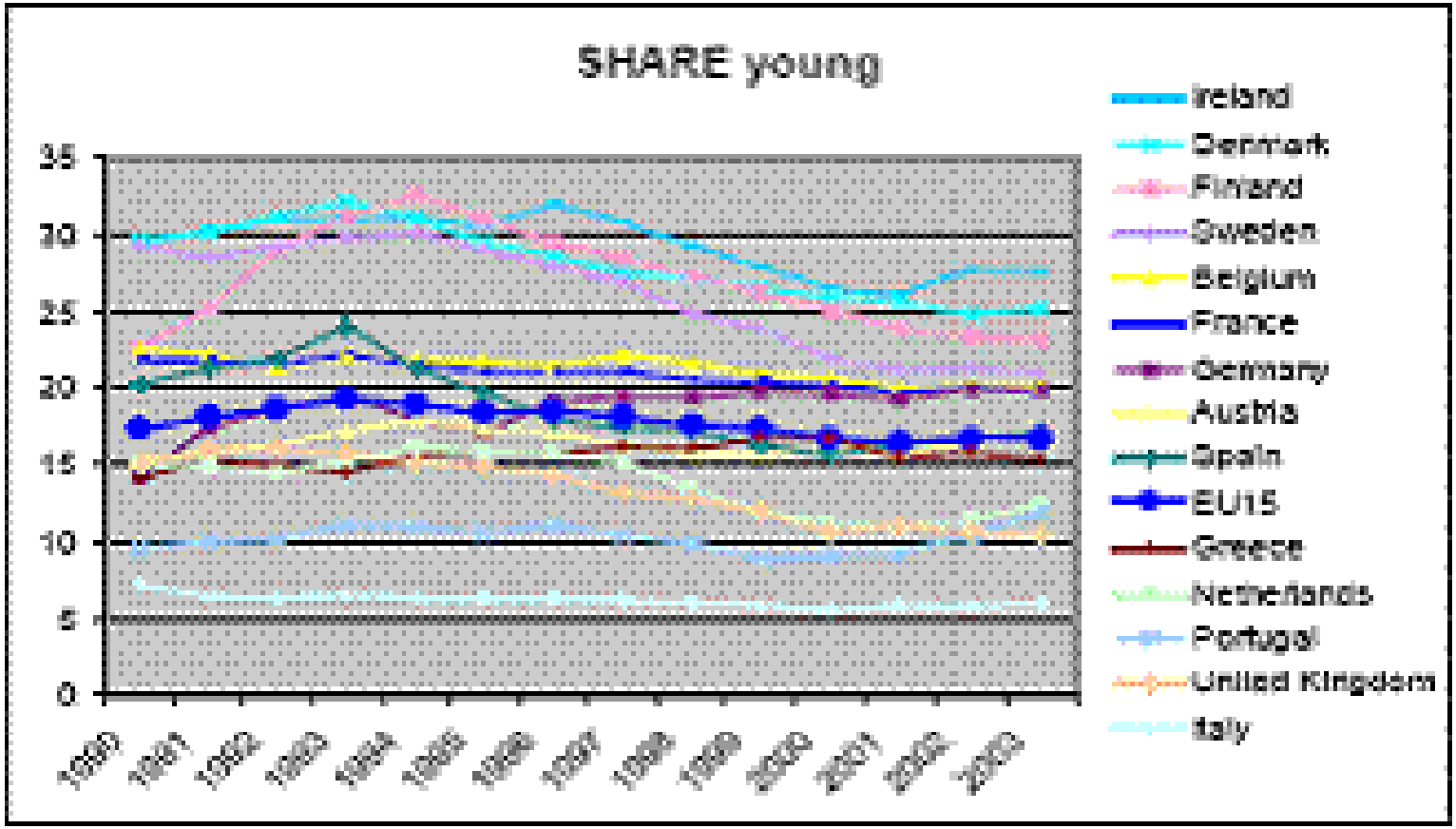
Figure 5.7. Employment ratios by age groups across OECD countries

Latest available year (2003 or 2002)



Source : OECD Labour Force Statistics

Figure 8: Share of Social Expenditures Dedicated to the Young (Percentages of Total)



Source: Eurostat Data Archive 2005

- **(EXTRACTED FROM BORSCH-SUPAN, THE LEVY ECONOMICS INSTITUTE WP-479, 2006)**

General effects of the change in demographics on Social Policy

- Impact on public current budgets: **housing policies, pensions, health care, long term care, other social services**

- Dynamics: Substitution Effect on other public policies while maintaining a balanced budget?

- Effects on the public debt if it is expected increases are financed in this way?

General effects of the change in demographics on Social Policy

- The impact on economic growth from increases in the tax burden with old and new programs financed without public deficit

- The higher dependence of new groups of population from public benefits

- For an equitable intergenerational balance of income in the ratio of workers/non workers over time…

Some considerations of '*public choice*'

1. The average age of the 'median' voter (decisive in the elections) has risen to 44 years and projections for 2050 put it at 57. How the recognition of citizens right to vote of immigrants will change this?.

2. Retirees on average show an index of support for the economic policy (in favour of more public spending) a 30% higher than the young population

(Actitudes de los españoles hacia la Hacienda Pública; J.L. Saéz Lozano Papeles de Trabajo 22, IEF, 2006)

Demographic changes : ***Relevant Assumptions***

Will birth rate rise substantially?

Will the pace of improvements in life expectancy decline (number of years, prevalence of morbidity, quality of life and social environment)?

Immigration is still a semi-endogenous variable?

Productivity with growth rate similar to the last ‘n’ years?

Adjustments for Spain: counting a cohort effect on rates of female participation

Demographic changes : ***Effects from Ageing on macroeconomics***

May be some assets that we buy today will not be able to be sold just as well tomorrow (fewer buyers in the case of housing?) and the fact that disinvested assets abundance from *baby boomers* will lower the asset prices.

Predictably negative impact on productivity, and thus on the income per capita (more non active population in the denominator), and differences involved in the productivity gap - through variations in human resources – except by the replacement of older by younger cohorts.

Exporting ‘goods’ in a free trade-global economy versus ‘exporting people’: what leads faster to income convergence? (*Heckscher-Ohlin* basic model…, depending on factorial endowment differences, capital/ labour technological differences, on the size of the economies, on the distribution of the benefits from trade

- on capital markets:

-The lower marginal propensity to save throughout the life cycle and a lower relative accumulation of capital for the today youngsters,

-the potential mobilization of assets through disinvestment, reverse mortgages and annuities, with an impact on the rate of interest (due to the increased liquidity)

-others..

…The OECD (Oliveira et. al. WP. 420, 2005), empirically quantify the impact of aging on the market demand factors and economic growth, estimating econometrically the reduction of the aggregate savings *(The impact of Aging on Demand, Factor Markets and Growth):*

:An increase in the percentage of the population between 65 and 99 years old has a negative impact on the interest rate more than five times higher than an increase in the participation of the population between 25 and 59 years.

Other macroeconomic aspects

…From the required transformations of the financial services (new forms of credit, integrated asset management and the cost of 'utilities') to the most simple changes in consumption and life styles, food and housing facilities

…New business opportunities: a more healthy ageing population and higher birth rates create new residential, recreational and leisure-time occupation, and other consumers needs.

…The needs of the daily life (information technology, logistics…), plus training or help to avoid functional illiteracy, to access to some private services, public social rights claims, schedule emergency services communication, and so on: From the resulting needs of education, to the help in the deterioration of physical and cognitive capabilities: bathing, dressing, meaning orientation, mobility, etc.

<u>Demographic changes</u> : ***Effects from Ageing on Social Spending***

<u>Source:</u> www.csis.org/media/csis/pubs/aging_index.pdf

…Assumption Average trend in productivty growth and consumption of public services as reflected in the patterns observed in The Luxembourg Income Study

- Share of social spending for population above 60s as a % GDP: from the 12.6% (year 2000) to 33.1% (estimated, 2040). Spain, with the highest increase among the 12 OECD analysed countries: 205%

- Ratio of net social benefits of population over 60s on the after tax income of population 15-59: changing from 17.2% (2000) to 42.7% (2040).

Population ageing and health expenditures: general issues

- In the political debate, population ageing is usually considered as the main driver of the steady growth of per capita health care expenditures in the developed countries observed in the past and expected in the future.

- However, since the last decade, the empirical evidence offered by health economists refutes the previous approach both on a retrospective and on a prospective basis.

Population ageing and health care expenditures: retrospective evidence

- Only one of the many **cross-national studies** that have examined the determinants of HCE in developed countries (Hitiris and Posnett, 1992) has found ageing to be a consistently significant regressor, when accounting for the effects of income, lifestyle factors and environmental factors (Gerdtham et al, 1998; Getzen, 1992...)

- On the other hand, those studies that have analysed for a given country the contribution of different factors to HCE growth have usually found a small contribution from the demographic factor:

  - Pellisé et al (2001): in Spain, during the nineties, only 12% of the public HCE growth can be attributed to population ageing

– In general, from a retrospective perspective, the main driver of the HCE growth have been technological change and the increase in the intensity in use of health services across all age groups (US: Reinhardt U. E. (2003): “Does the aging of the population really drive the demand for health care?”. *Health Affairs, 22(6): 27-39.)*

Population ageing and health care expenditure: prospective evidence

- Naïve models: assume that age-specific per-capita expenditures depend only on the state of medical technology and remain stable when the latter is controlled for. Thus they calculate the impact of population ageing on HCE by applying present age-expenditure profiles to future age distribution of the population.

- Most of the projections made by naïve models coincide to conclude that the population ageing on health care expenditures would be quite modest:
  - Ahn et al (2003): in Spain, during the period 2002-2043, public health expenditures can increase a 0.68% per year because of population ageing (the overall increase for the whole period 1990-2002 was 6.6%): this makes for just a tenth!

The importance of time to death on HCE (I)

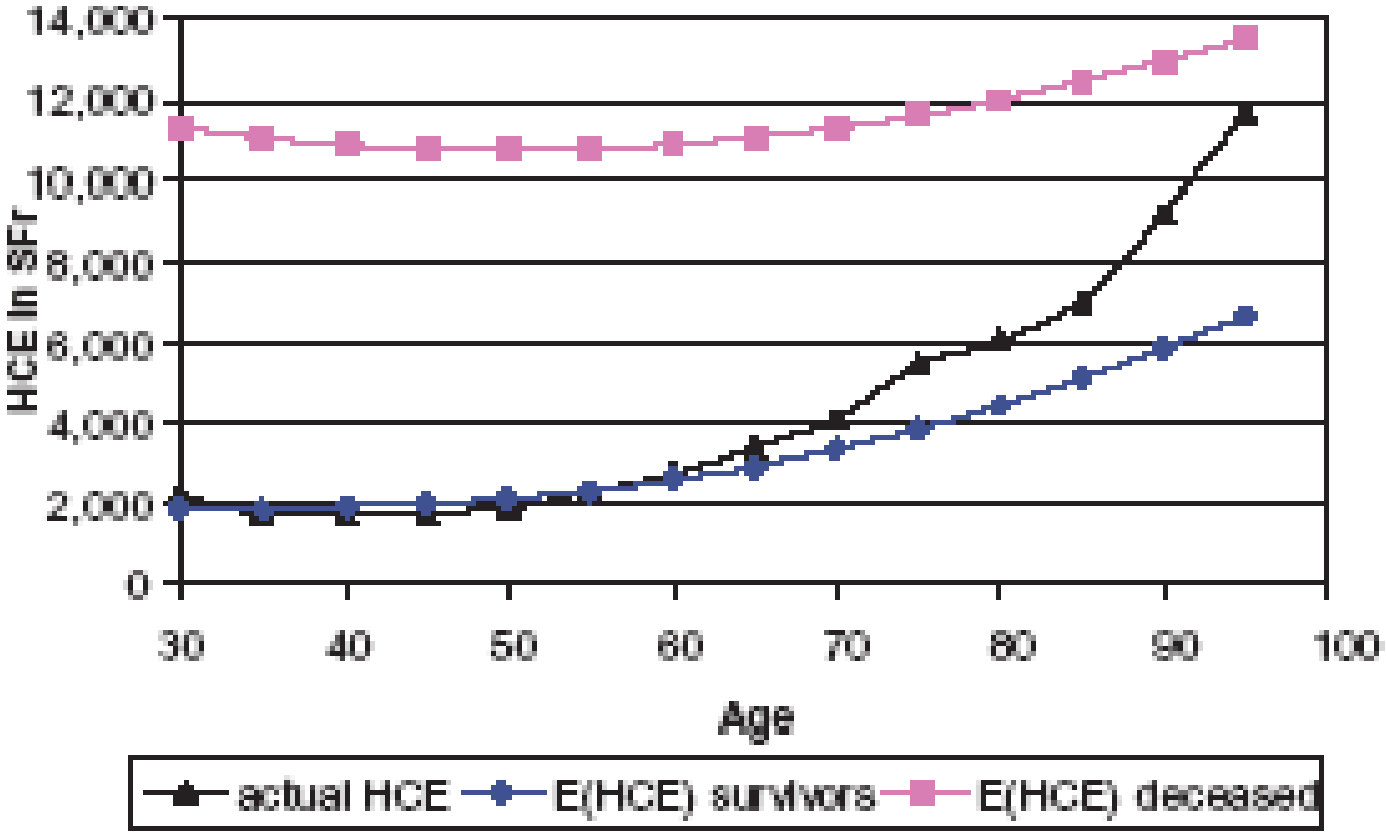
- The *naïve models* in obtaining HCE projections only take into account the effect of age on health care costs. However, lately, many studies have detected that the importance of age is much smaller once we control by time to death (Lubitz and Riley, 1993; Zweifel et al, 1999; Stooker et al, 2001; Seshamani and Gray, 2004; Stearns and Norton, 2004; Zweifel et al, 2004).

– These studies have discussed from a methodological perspective around two issues:

  - Multicollinearity (basically between age and time to death)
  - Endogeneity (reverse causality: HCE affects survival)

The importance of time to death on HCE (II):

HCE, SLIGHTHY CHANGES WITH AGE; IT CHANGES BASICALLY WITH DEATH. The age profile of HCE is a composition effect that results from different survival rates



Source: Zweifel, Felder and Werblow (2004).

- **THE ECONOMIC RELEVANCE IN CONTROLLING PUBLIC SPENDING**

- **The 6% of Medicare recipients who die in a given year account for 28% of Medicare expenditures (Hogan et. al in *Health Affairs*, 20; 2001**

- **Similar findings have been reported for Long Term care (Stooker et al. for Netherlands, in *Inquiry*, 38; 2001)**

- **<u>The Oxford Record Linkage Longitudinal Study</u> (1963-99) Sishamani and Gray, *Journal of Health Economics*, 23; 2004)**

  - **The chance of being in hospital at the last year previous to death is 55% (probability changes from 10 to 55%)**
  - **Once then in hospital cost is 15.000 €**

Time to death and HCE projections: 2nd generation models (I)

- The fact that it is time to death and not age that determines the differences in HCE among individuals, causes, caeteris paribus, an upward bias in HCE projections derived from the naïve models, since….

- We expect lower mortality rates in the future: future age-expenditure profiles will be then lower because fewer persons will be in their last years of life in each age group.

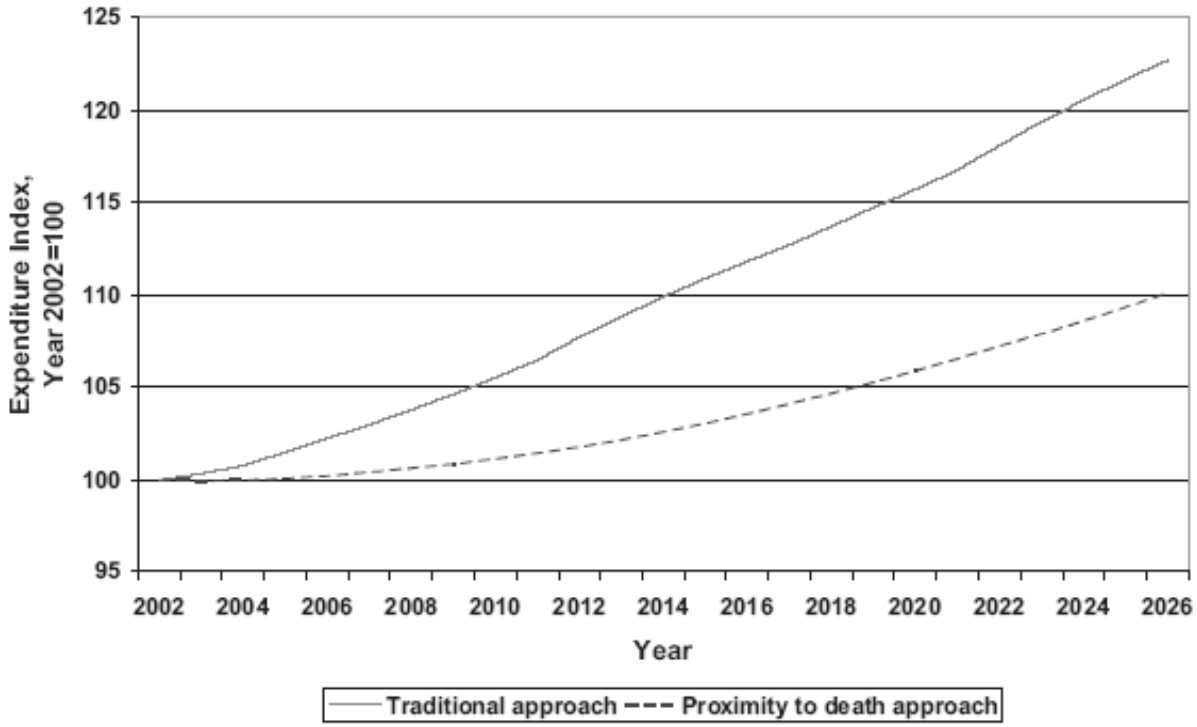
Time to death and HCE projections: 2nd generation models (I)

- Therefore, aiming to obtain more accurate predictions of future HCE, some recent papers have developed more sophisticated projection models that take into account both age and time to death (the remaining life expectancy) in HCE forecasting:
  - Seshamani, M. and Gray, A. (2004): "Time to death and health expenditure: an improved model for the impact of demographic change on health care costs". *Age and Ageing, 33: 556-561.*
  - Breyer, F. and Felder, S. (2005): "Life expectancy and health care expenditure: A new calculation for Germany using the costs of dying". *Health Policy* (in press).
  - Stearns, SC and Norton, EC (2004): "Time to include time to death? The future of health care expenditure predictions". *Health Economics* 13: 315-327.

Time to death and HCE projections: 2nd generation models (II)

- **Seshamani and Gray (2004)** compare <u>hospital costs</u> projections in UK obtained by a naïve model or by an "expanded" one that considers time to death...

Projections of aggregate hospital costs, traditional vs proximity-to death models, 2002-2026.



Source: Seshamani and Gray (2004).

Time to death and HCE projections: 2nd generation models (III)

- **Breyer and Felder (2005)** have realized a similar exercise for Germany considering all health care costs (not only hospital costs) and a wider period (2002-2050): n for naïve; q for a model with expanded survival under present health status (q1), or under a non-deteriorating one (q2). The naïve model overvalues in between 17 to 52% according to the year.

Table 1

Age-specific expenditures of 2002 and demographic change until 2050 with and without costs of dying

Year	*n*-Model		*q*-Models				Error of the *n*-model (%)	
	in €	2002 = 100	*q*1		*q*2		*q*1	*q*2
			in €	2002 = 100	in €	2002 = 100		
2002	2596	100.00	2596	100.00	2596	100.00	0	0
2010	2691	103.66	2674	103.00	2642	101.77	18.0	51.7
2020	2827	108.91	2788	107.38	2745	105.73	17.2	35.7
2030	2961	114.05	2894	111.45	2798	107.78	18.5	44.7
2040	3094	119.19	3007	115.83	2885	111.11	17.6	42.1
2050	3217	123.92	3102	119.49	2959	113.96	18.5	41.6

Source: Breyer and Felder (2005).

Time to death and HCE projections: 2nd generation models (IV)

- **Stearns and Norton (2004)** estimate lifetime expenditures for a cohort of individuals aged 66-70 with a simple model that excludes time to death and with an expanded one that controls for it:

Table 4. Simulation results

	Medicare expenditures under current (1998) longevity estimates	Medicare expenditures under future (2020) longevity estimates
Expected lifetime Medicare expenditures per person using the simple model	$102 069	$117 037
Expected lifetime Medicare expenditures per person using the expanded model	$93 638	$101 524
Difference (overestimate by simple versus expanded model)	$8431	$15 513
95% CI for difference	($6313, $11 010)	($13 067, $18 182)
Difference as a percent of expected Medicare expenditures per person using the expanded model	9.00%	15.28%

All expenditures are in 1998$. Lifetime expenditures are on average from age 66–70 until death. The 95% confidence intervals are bias-corrected percentile intervals based on 280 bootstrap iterations.

Source: Stearns ans Norton (2004).

Demographic changes : ***Effects from Ageing***

- Taxes on GDP if the expected social spending from ageing is financed by taxation: from 38.2% to 57.2% (200-2040)

- At constant tax/GPD the increase of share of social benefits to those above 60s (crowding-out other public programs) on total public expenditure: From 32.7% (2000) to 72.1% (2040).

Demographic changes : ***Effects from Ageing***

- If the expected increase of social spending due to ageing would be financed by issuing debt: in 2029 its share on GDP would reach the figure of 150% (a 38.2% at present)

- The share of social benefits on total after tax income of those above 60s, to move to a 67% in 2040.

- Private pension funds would not match the expected increase: in % of GDP will not be higher than 3% in 2040!!.

Demographic changes : ***Effects from Ageing***

- Best ‘matching’ yet from the family pool of revenues coming from the fact that 40.5% of our elderly cohabit with their sons.

- At the global level, the relationship between the per capita income after taxes of those above 60 and 15 to 59 will recah in 2040 the figure of 118%: a clear symptom of the nature of the problem we face!!

Demographic changes : ***The need for a more equitable equilibrium***

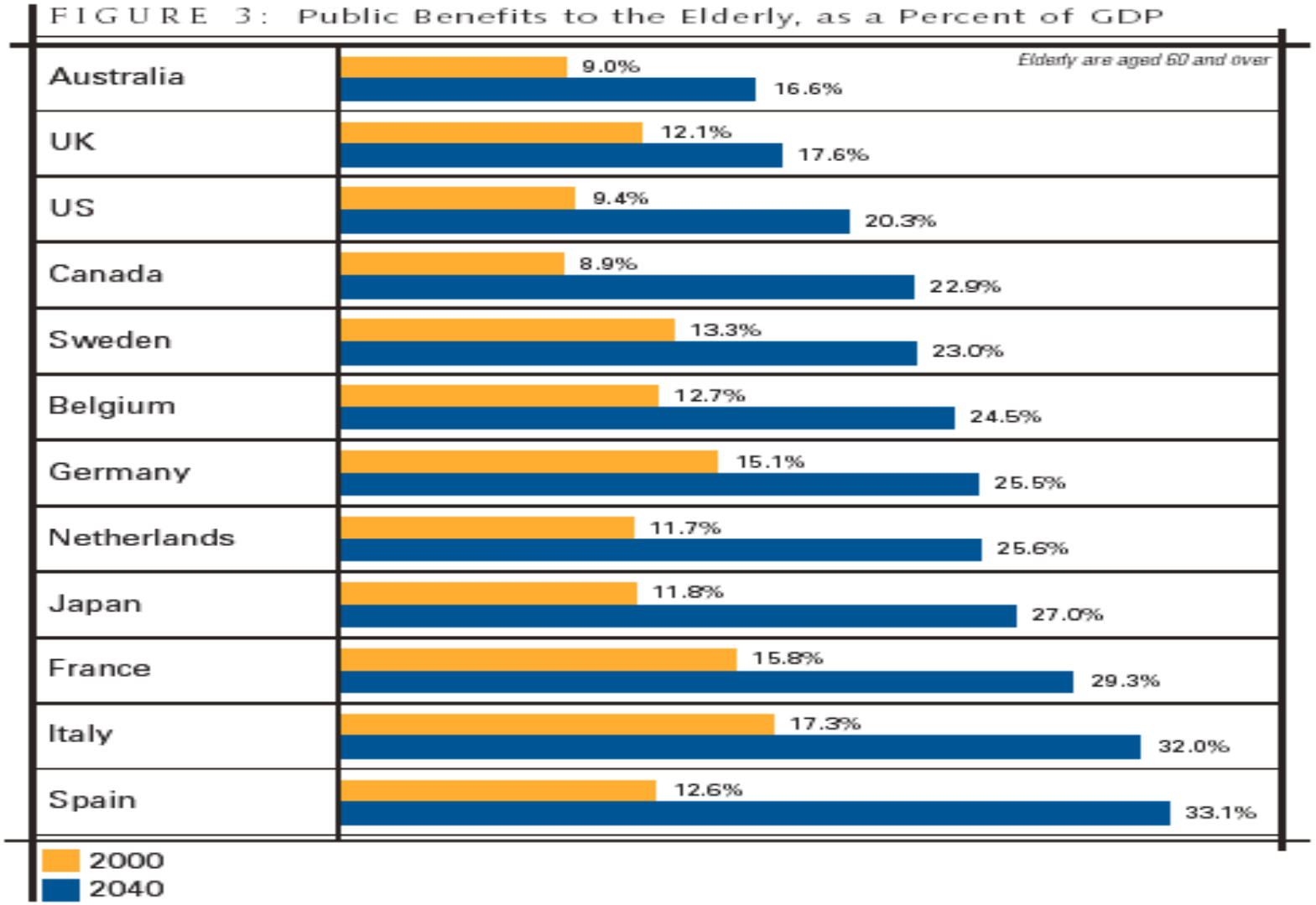
- Musgrave's fixed proportions rule provides a formula to insure inter-generational fairness. It proposes to define a desirable lifetime distribution of income or welfare consumption and stick to it over time.
- Whether retirement is to be relatively short and frugal or extended and relatively costly in proportion to earlier stages of life, the adopted proportion ought to be kept over time and generations.
- Obviously the proportion cannot be exactly fixed because available funds fluctuate with demographic trends and productivity shocks. But it is recognised the need to split any surplus or deficit homogeneously among all age groups at every instance

THANKS FOR YOUR ATTENTION!!

….FOLLOWS A DATA ADDENDA

Some approaches to the effects of ageing on social policy

Source: www.csis.org/media/csis/pubs/ageing_index.pdf



Different approaches to the effects of ageing on social policy

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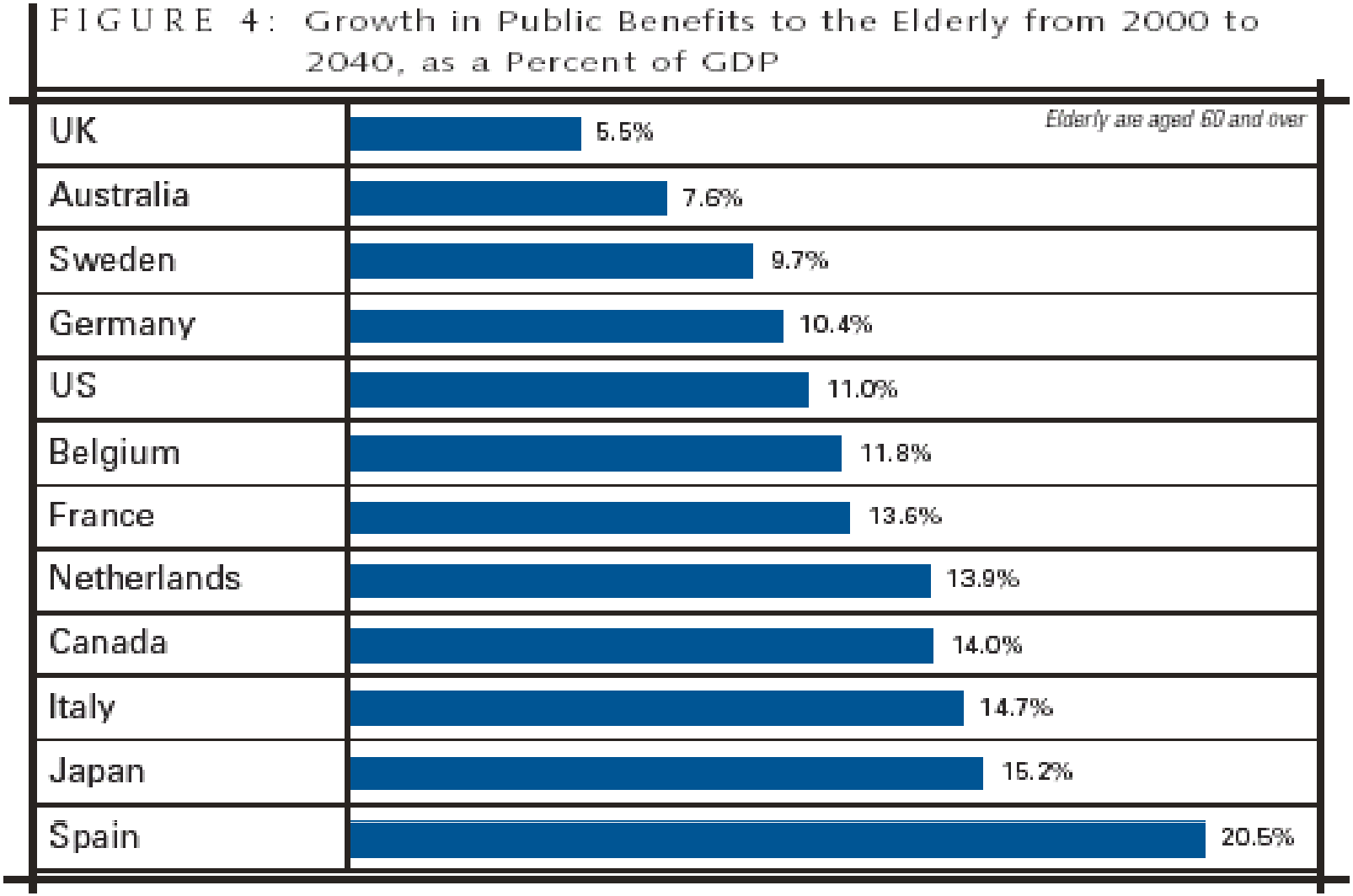

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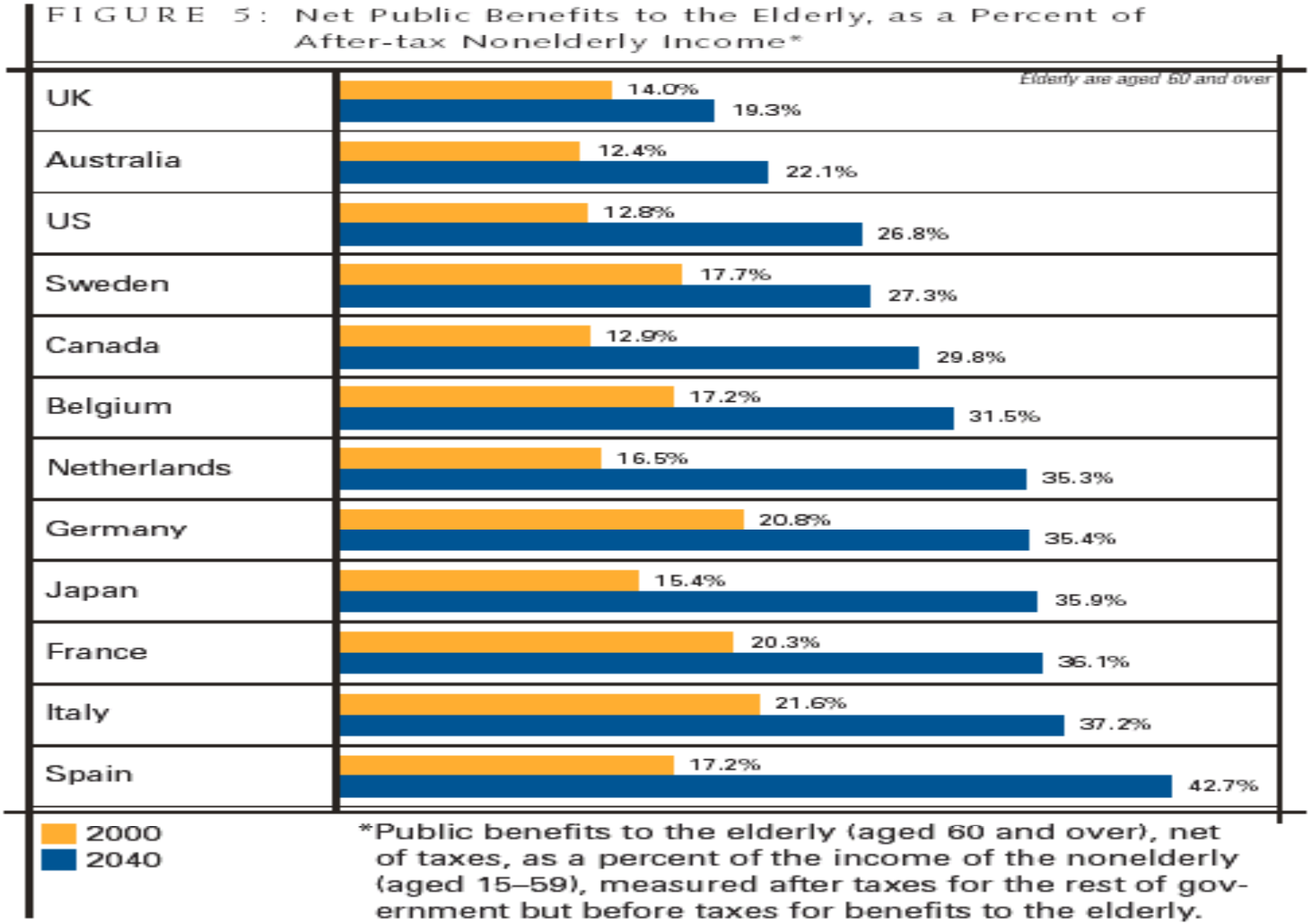

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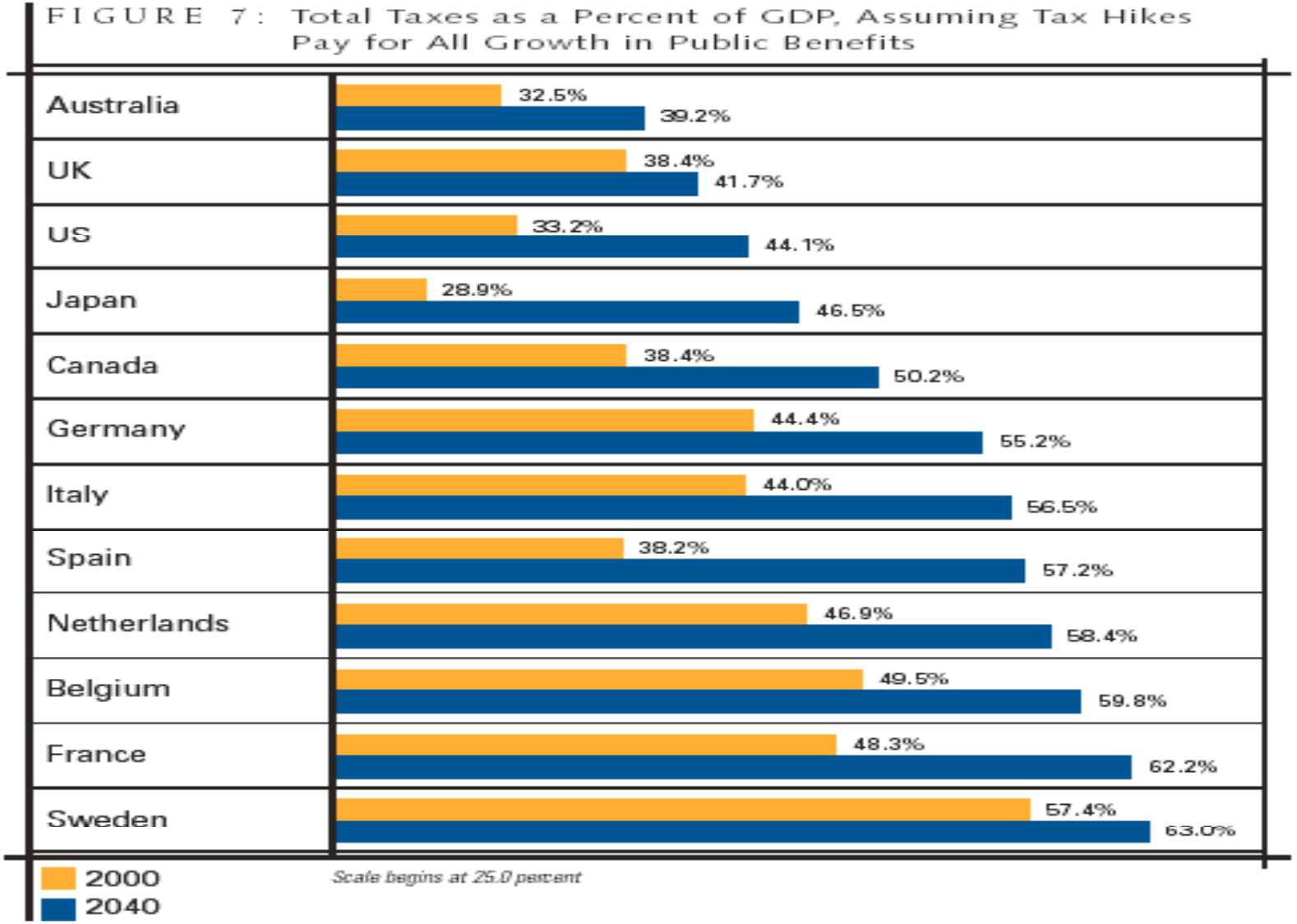

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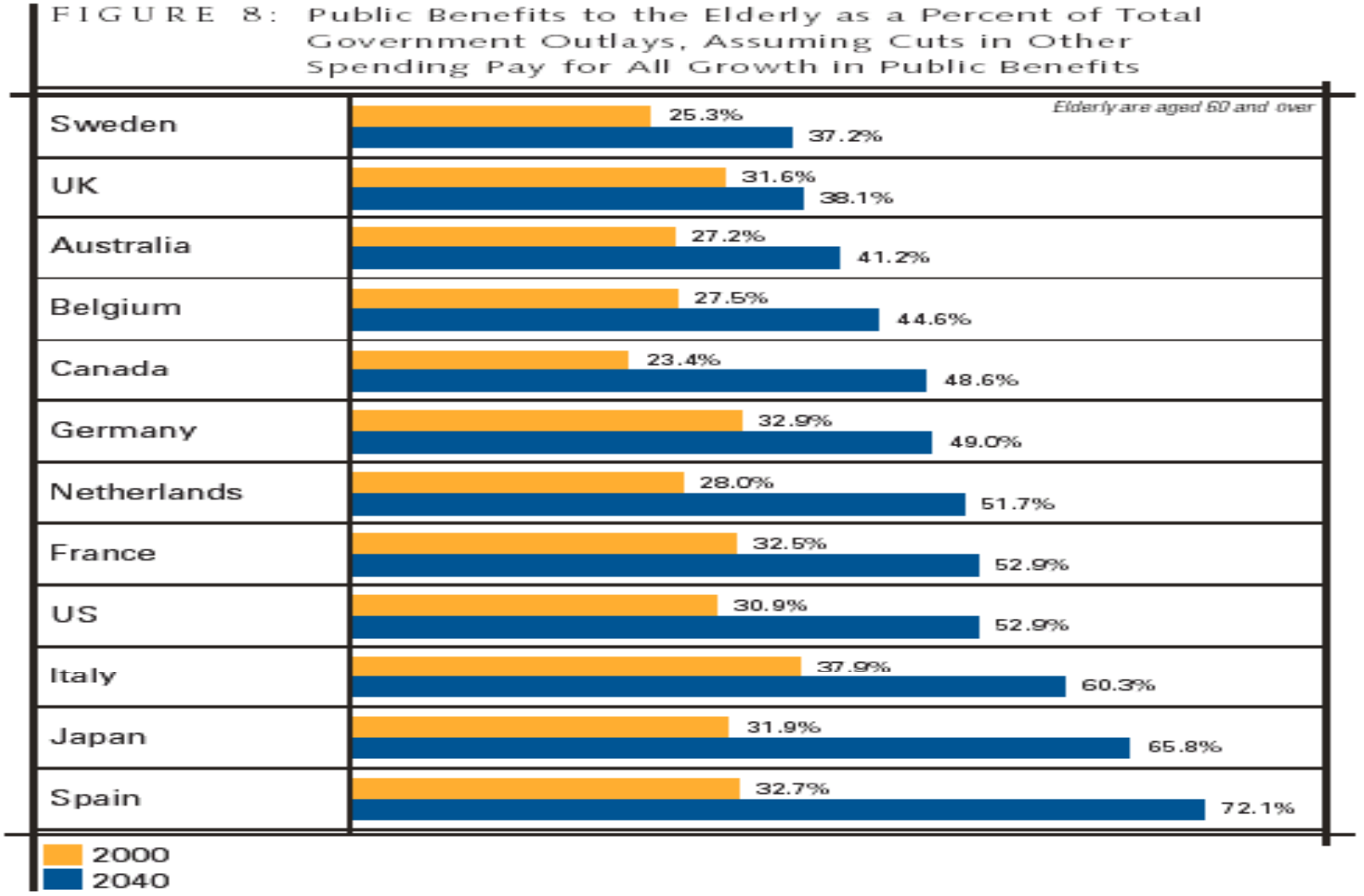
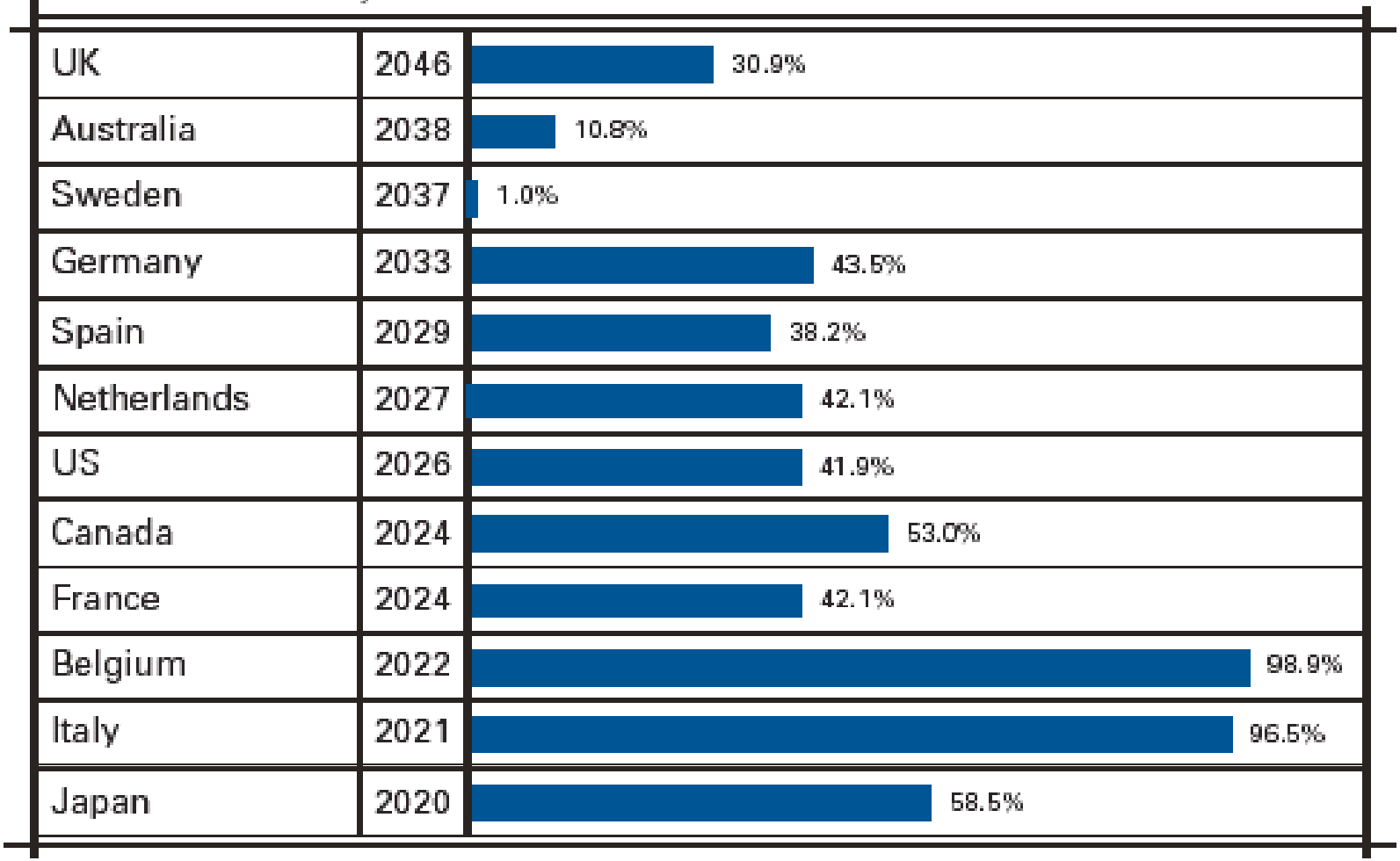


Different approaches to the effects of ageing on social policy

Source : www.csis.org/media/csis/pubs/ageing_index.pdf

FIGURE 9: Net Government Debt in 2001 and Year Net Debt Reaches 150 Percent of GDP, Assuming Borrowing Pays for All Growth in Public Benefits



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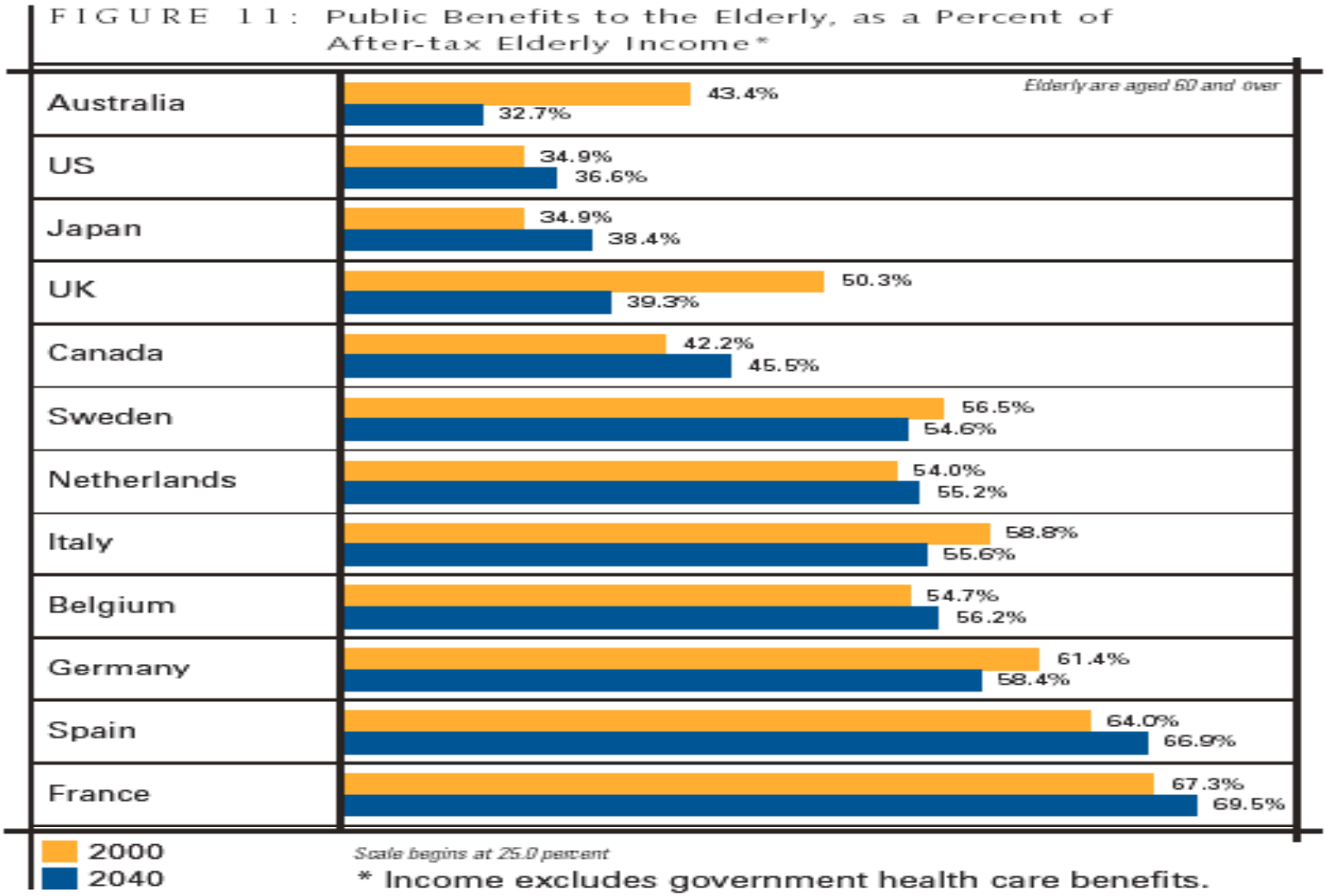

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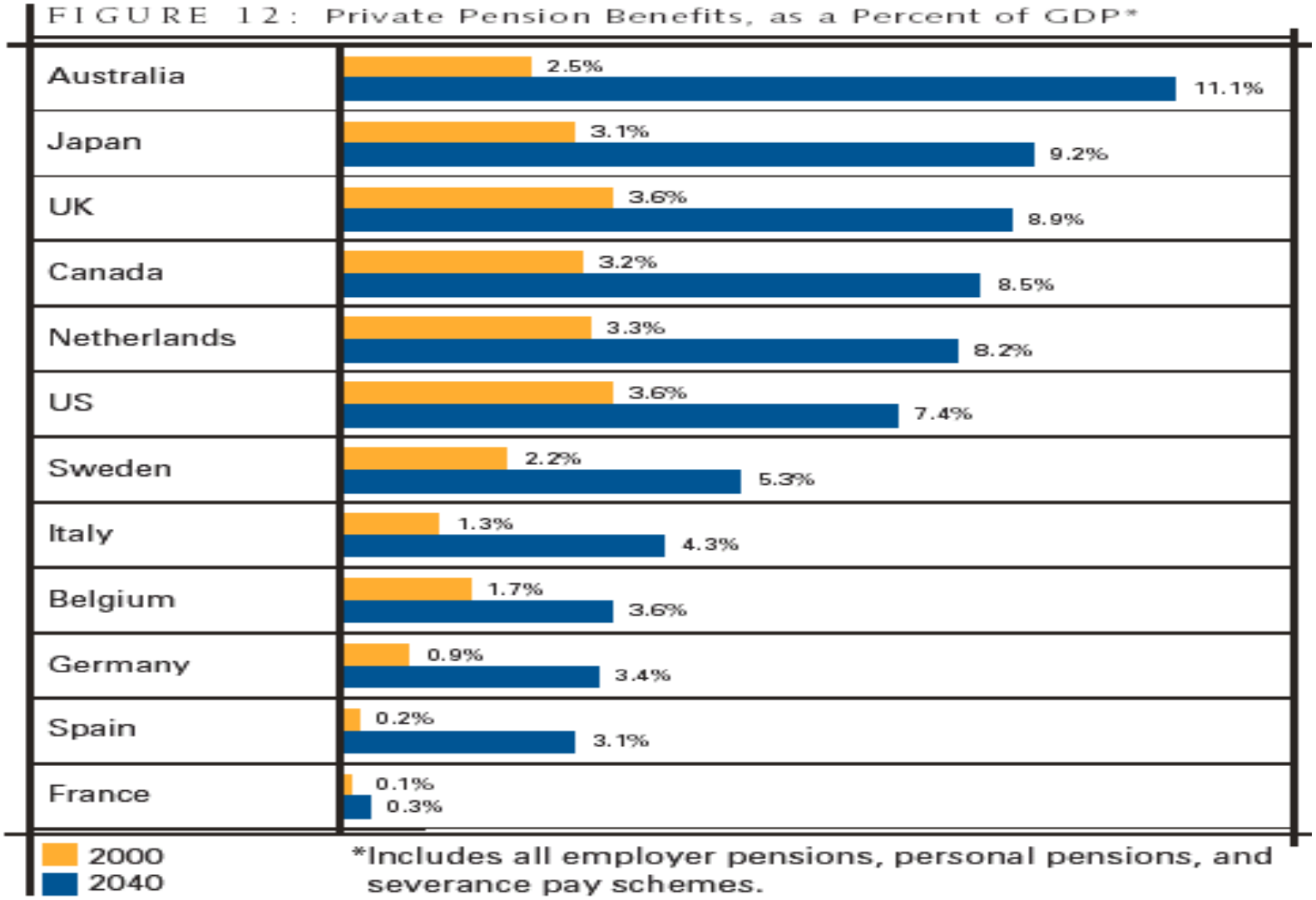

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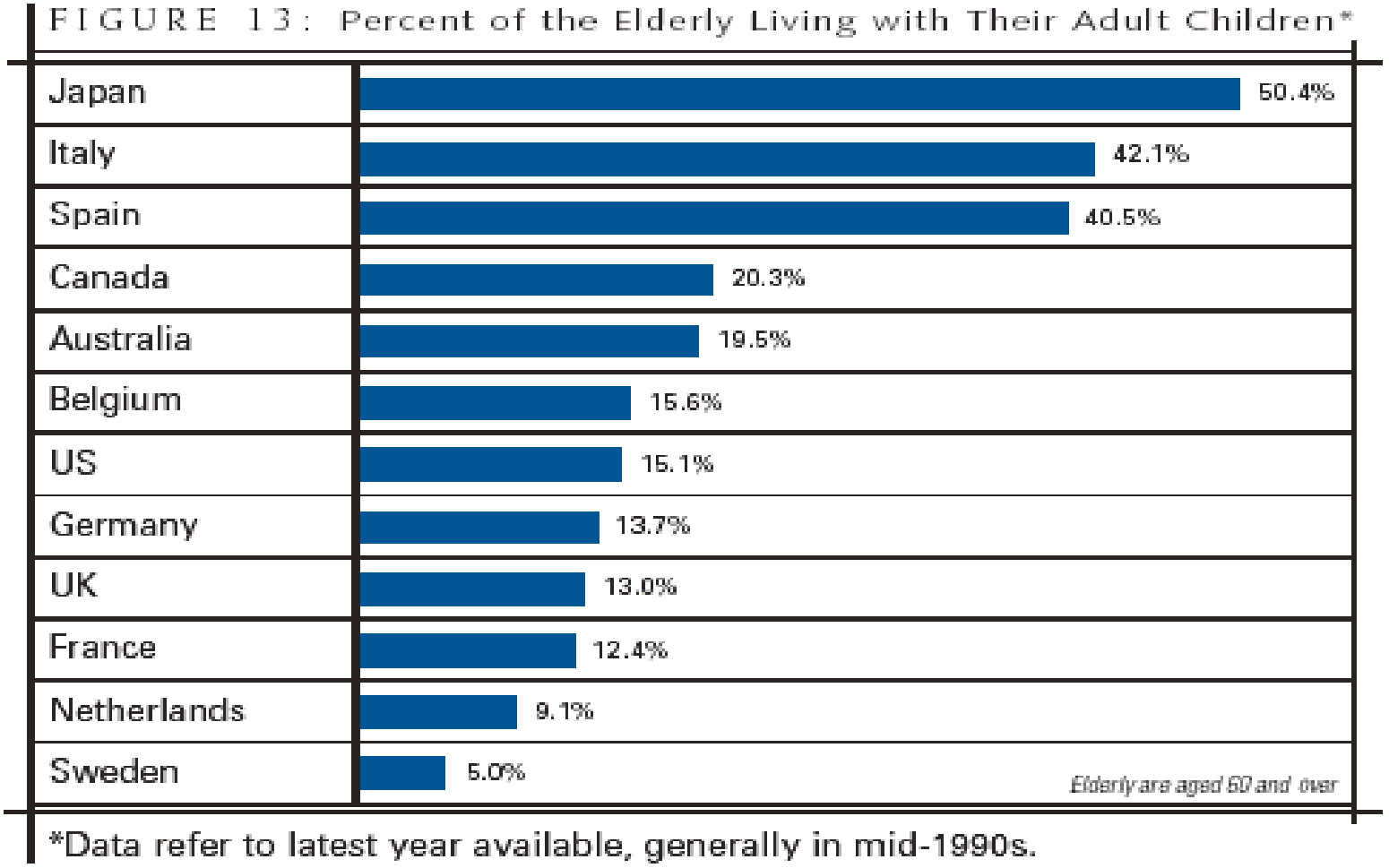

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