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IN THIS ISSUE

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Claudio Ceccarelli

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IN AESOP'S WORDS "GRASSHOPPERS AND ANTS" IN EUROPE: A MISLEADING STORY¹

Gian Carlo Blangiardo, Stefania Maria Lorenza Rimoldi

1. Introduction

The demographic asset (DA) of a population plays a fundamental role in forecasting its future performance in terms of life-years available to live. Although for a single person an additional year has the same value at every age, for a population it counts differently at each age: it represents a cost when gained in education or retirement age, and a credit when in active age. As far as life ages are concerned, the annual variation of the balance between the negative (education and retirement) and the positive (activity) components of the DA results from the combination of the variation of each of the three modules. By comparing the trend of these interactions to the consolidated gross debt, the European clichés of "grasshoppers and ants" look fuzzy.

In this paper, we intend to forecast some possible scenarios for the amount of productive future of five European countries (France, Germany, Italy, Spain and the United Kingdom) considering that a certain share is already mortgaged through the consolidated gross debt.

2. Data and methods

In this paper, we compared the main five countries of the European Union: France, Germany, Italy, Spain and the United Kingdom. We measured their demographic asset (DA) at the time $1.1.t$ as follows (Blangiardo, 2012; Blangiardo and Rimoldi, 2013),

$$DA(1.1.t) = \sum_x P_x^s(1.1.t) \cdot \tilde{e}_x^s \quad s = m, f; \quad x = 0, 1, \dots, \omega - 1..$$

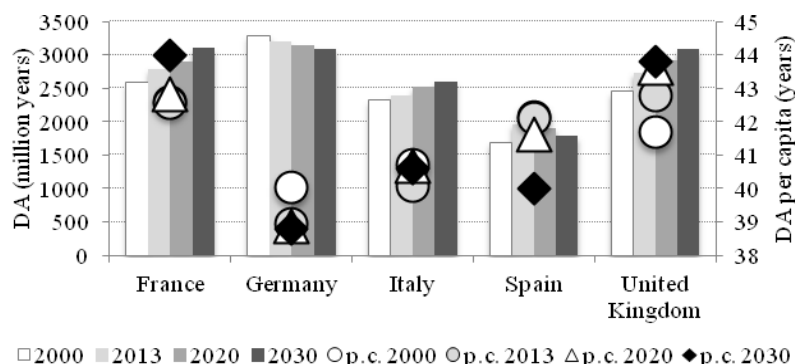
¹ Paragraphs 1.3 are due to Blangiardo G.C, and paragraphs 4-6 are due to Rimoldi S.M.L.

The *DA* of a country at a certain time consists in the overall amount of residual years for the population to live, computed on the basis of the individuals' life expectations. The *DA* is computed at the times 1.1.2000, 2013, 2020 and 2030. The source of the data is the Eurostat database.

3. The demographic asset: 2000-2030

Observing the projected data of *DA* for the 5 biggest countries of the European Union - forming 63% of the EU (28 countries) populations - an increasing trend of the *DA* is recognizable for France, Italy and the United Kingdom. Germany and Spain, on the contrary, show a decreasing trend in the next decades. These diverging tendencies in the upcoming years are visible also for the *DA* per capita (Figure 1).

Figure 1 - Demographic asset of the main countries of the European Union. 2000-2030.
Source: authors' elaborations on Eurostat data.



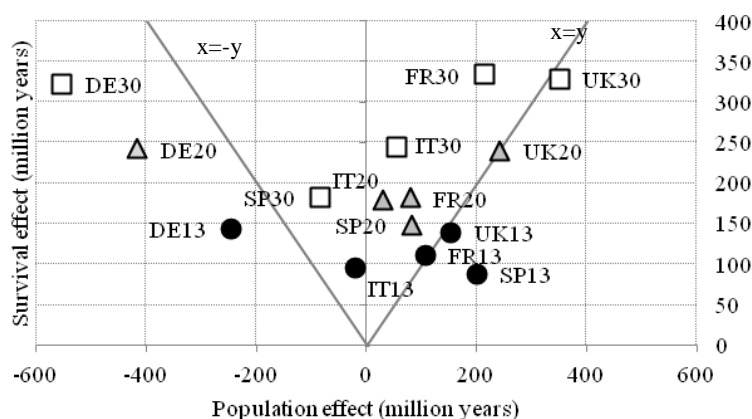
Considering the latter, differences appear more visible. In particular, as regards the “increasing group”, the *DA* per capita is forecasted to increase at a slower pace than in the past in the UK and at a faster pace in France, while in Italy it remains almost stable. As largely detailed in previous researches (Rimoldi and Barbiano di Belgiojoso 2013), the exceptional dynamism of France and the UK derives from their high fertility rates which, in terms of total number of expected years to live, are more profitable than net migrations (the other positive item).

Some interesting features of the *DA* can be caught by splitting its variation into the two components that form it: the *survival effect* and the *population effect* (Figure 2). While the survival effect is always positive, the population effect can have a negative outcome.

Figure 2 - Demographic asset by survival effect^a and population effect. 2000-2030.

Notes: (a) Survival effect forecasts are from Eurostat projections (Europop2013).

Source: authors' elaborations on Eurostat data



During the interval 2000-2013, the survival effect is slightly higher for France, the UK and Germany compared to Italy and Spain. The population effect is consistently positive for France, the UK and Spain above all (+200 million years), while it is not significant for Italy and dramatically negative (-200 million Years) for Germany.

In the next years, 2013-2020, both the UK and Germany will profit from a neat positive survival effect (+250 million years); but while in the UK the population effect will be just as high (+250 million years), in Germany the population effect will be strongly negative (-415 million years). France, Italy and Spain share the same level for the survival effect (around 180 million years), but only the Italian situation is characterized by a negative (although modest, -30 million years) decrease by population effect.

In the following decade, 2020-2030, the gap observed earlier diverges. Improvements in the UK's values are observed in both survival and population effects (nearly +350 million years both), while the gain of France in population effect (+214 million years) is lower than in survival one (+350 million years). Also Italy profits from a higher survival (+244 million years) and from a positive performance in population (+55 million years), modest but enough to invert the negative trend. Spain, on the contrary, shows the lowest increase in survival (+183 million years) and even a loss (-83 million years) in population effect. Finally, Germany continues along the path of a dramatic loss in population effect (-553 million years).

4. Splitting the DA by age groups

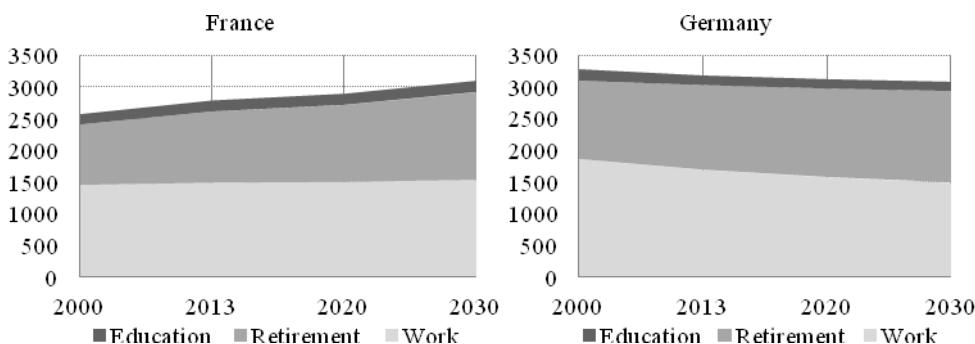
What does the trend exposed explicitly consists in?

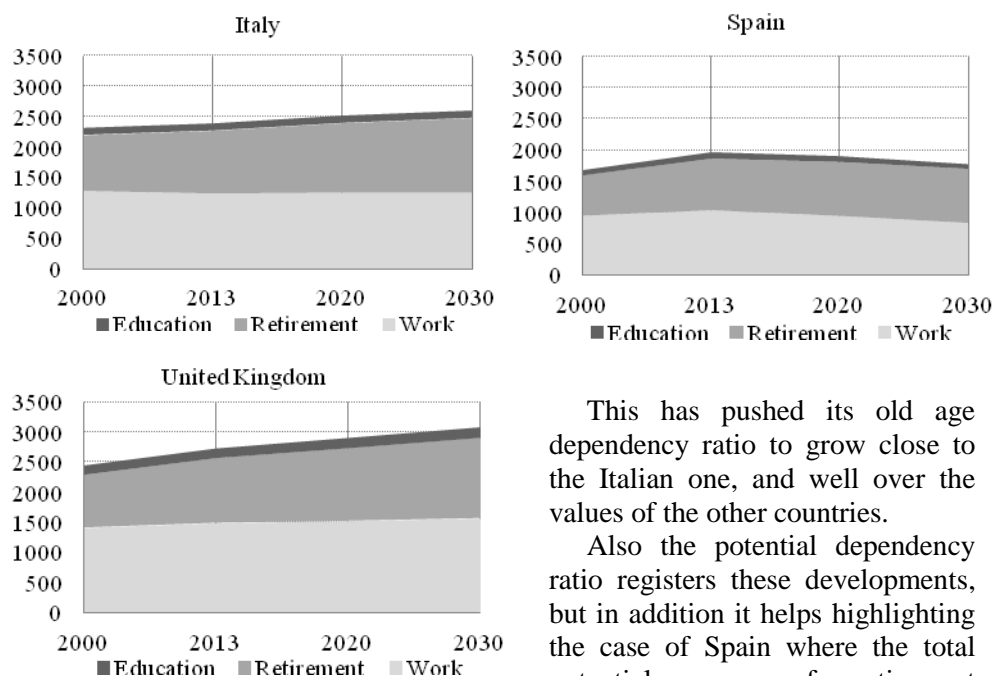
To answer this question it is necessary to refer to the distribution of the DA into its three main components, based on age composition (Figure 3). Therefore, considering the DA gained in ages of education (up to the 20th birthday), in ages of work (20-64 years old) and ages of retirement (65 years old and more), one can notice that, during the period 2000-2030, the amount of the DA collected in working age is supposed to increase in France and the UK, remain stable in Italy and decrease in Germany and Spain. On the contrary, when it is considered in terms of share of the overall DA, it appears to decrease almost everywhere. Specifically, by 2030 the working-age-DA will consistently decrease in Spain (around -6 percentage points) and in Germany (-5 percentage points): for both the countries it will fall to 48% of the overall DA. The limit of 50% will be overtaken also by Italy, for which the decrease of working-age-DA will be about -4 percentage points. Spain and Germany are also characterized by the highest increase of the retirement-age-DA: around +7 and +5 percentage points by 2030, for Spain and Germany respectively. Both of them will reach 48% of the overall DA by 2030. It is possible to observe the effects of demographic aging by comparing the old age dependency ratio with the analogous “potential” index. In 2000, the classic old age dependency ratio was similar in all countries taken into consideration (nearly 27%), with the extremes occupied respectively by Germany at the bottom (26%) and by Italy at the top (29%). The correspondent “potential” index puts forward a wider distance between the countries’ performances (Figure 4). In this past decade, the aging process (common to all the countries considered) has been accompanied in Germany by a sharp decrease of the working age population.

Figure 3 - *Demographic asset by age groups^a. 2000-2030.*

Notes: (a) Age of entrance in working age = 20; age of exit = 65.

Source: authors’ elaborations on Eurostat data.





This has pushed its old age dependency ratio to grow close to the Italian one, and well over the values of the other countries.

Also the potential dependency ratio registers these developments, but in addition it helps highlighting the case of Spain where the total potential years of retirement increases enormously in correspondence to population that nowadays ages 36-69, i.e. the largest and most benefitted post-war cohorts 1945-1978.

What about the future? In the very next years Germany is expected to go ahead towards a steep decrease of working population, together with the growth of the old age one. This will lead Germany to reach the greatest value of traditional dependency ratio (39% in 2020 and 51% in 2030). As a matter of fact, considering the potential index, it appears slightly smaller than the Italian one in 2013: this is most likely due to constantly higher survival expectations for the Italian population. An even enhanced gap in the trends of the two ratios can be seen as regards France and Spain in 2020: the traditional dependency ratio is foreseen higher for France (36%), than Spain (33%) while the potential ratio is higher for Spain (90%) than France (79%). This gap is attributable to the more accurate ability of the potential ratio to count for the simultaneous decrease of years in working age and increase of years in retirement age observed as regards Spain.

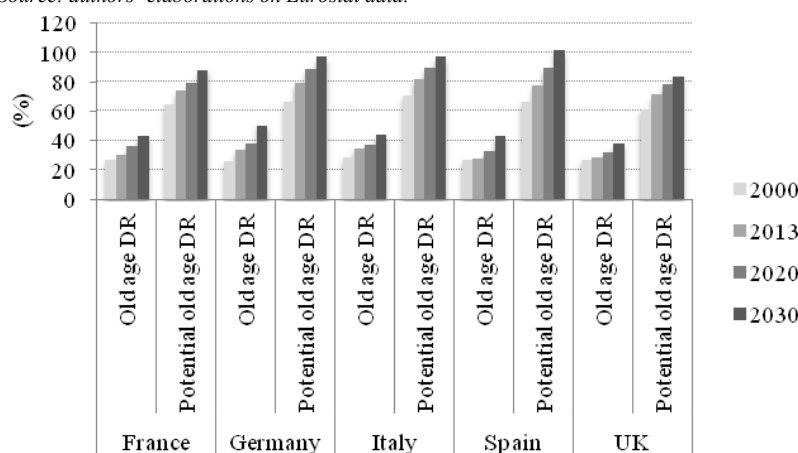
Finally, as regards 2030, while the highest value of the dependency ratio is foreseen for Germany (51%), the highest potential index is expected for Spain, where the index is supposed to overcome 100% (i.e. 102 expected potential years of retirement for each 100 expected potential years of work). The outstanding growth of old dependency in Spain is largely attributable to the strong decrease of

working age population, as two simultaneous events combine to bring it about: the shrinkage occurred in the past of the cohorts involved (1996-1998) and the persisting negative net migration in Spain until the 1980s, when the trend inverted (Arango, 2009).

Figure 4 - Classic old age dependency ratio compared to potential old age dependency ratio^a. 2000-2030.

Notes: (a) Age of entrance in working age = 20; age of exit = 65.

Source: authors' elaborations on Eurostat data.



5. Facing the debt with the DA

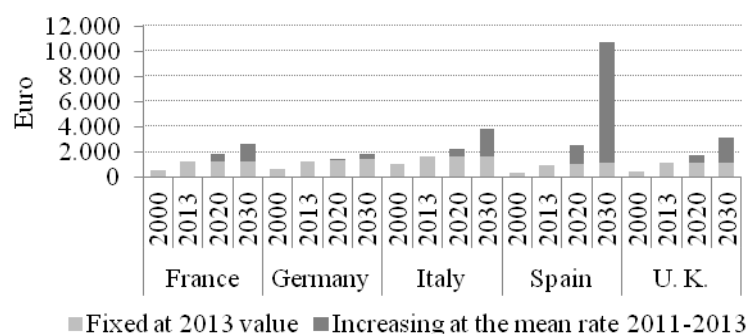
By means of the ratio between the General Government Consolidated Gross Debt and the working-age-DA, it is possible to compute the per potential-working-year (PWY) debt. Keeping the current (2013) debt constant, some interesting features can be expected by 2030 (Figure 5). In this borderline case, the current per PWY debt is expected to reduce within 2020 by 26 Euros for an English person, by 20 Euros for an Italian and by 12 Euros for a French. On the contrary, it is expected to increase by 98 Euros for a German and by 87 Euros for a Spaniard. Ten years after, only France and the UK can take advantage from a reduction of per PWY debt (-24 and -33 Euro, respectively). In 2020-2030 no substantial changes are expected for Italy, while Germany and Spain would still show an increase of per PWY debt: +78 Euro for Germany, + 138 Euro for Spain.

Under the hypothesis of an increasing debt at the average two-year-period rate 2011-2013, a worrying scenario is envisioned. In the first period, 2013-2020, all the countries considered would experience a substantial increase of per PWY debt

(about 550 Euros for France, Italy and United Kingdom, 1,650 Euros for Spain), except for Germany (+ 230 Euros).

Figure 5 – General Government Consolidated Gross Debt per potential-working-year. Minimum and maximum scenarios. 2000-2030.

Source: authors' elaborations on Eurostat data.



The following decade would produce a further increase up to redoubling the Italian per PWY debt (up to 3,840 Euro) and nearly tripling the English one (up to 3,122 Euro). The most striking result would affect Spain, for which the per PWY debt would exceed 10,800 Euros. Therefore, in light of what emerged, one can ask what would be the current total debt compatible with the 2000 per PWY, or what would be the future debt compatible with the current PWY, in order to isolate the effect of variation of working age population on debt.

Table 1 – Current debt, actual and compatible with the 2000 per potential-working-year, and future debt compatible with the current per potential-working-year.

Notes: (a) Countries are ordered by actual 2013 debt; (b) potential-working-year.

Source: authors' elaborations on Eurostat data.

Countries ^a	(1) Current debt compatible with the 2000 per PWY ^b	(2) Actual 2013 debt	[(2) – (1)]	2020 debt compatible with the current per PWY	2030 debt compatible with the current per PWY
Italy	1,259,636	2,069,216	809,579	2,094,658	2,086,662
France	846,366	1,925,292	1,078,926	1,944,212	1,981,718
UK	675,697	1,752,399	1,076,702	1,792,230	1,844,920
Germany	1,120,916	2,147,028	1,026,112	1,999,018	1,890,056
Spain	407,844	960,676	552,832	877,474	774,171

Comparing the present debt with the hypothetical one compatible with the 2000 per PWY, the greatest increase during 2000-2013 must be ascribed to the

UK (+160%), Spain (+136%) and France (+128%). Germany and Italy, on the contrary, show the lowest increase with +64% and +92% respectively (Table 1).

Keeping constant the amount of per potential-working-years at the current level, the compatible amount of debt in the next years (2020) should increase very little or, in the case of Germany and Spain, even reduce. The hypothetical picture for 2030 appears even more dramatic (for Germany and Spain, above all) in case of unchanged productive population potential.

6. Conclusions

Potential demography helps to highlight the worrying scenarios which all the countries taken into consideration are going to face in the next years. Research findings come out in favour of the definition of a more realistic parameter to judge the ability of a country to face its financial commitments. In short, reasonable limits of growth for debt should take into account each country's productive population potential. Otherwise, also the countries, like Germany, that are profiting from a favourable circumstance at the moment, will suffer in the next years from a decrease in their productive population potential.

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SUMMARY

This paper suggests potential demography as a tool to highlight the need to take account for the productive population potential in order to judge its ability to face its financial commitments.

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