Box 4.1

POPULATION PROJECTIONS FOR SPAIN: COMPARISONS AND UNCERTAINTIES

In October 2018, the INE published the latest population projections for the period 2018-2068.[1] The starting point for these projections are the provisional population figures at 1 January 2018, which reflect an increase of almost 220,000 persons on the figure projected for that year in October 2016. In the new projections, the INE estimates continued growth of the total population, to a record high bordering on 50 million inhabitants in 2048, after which moderate declines are expected. The new projections represent a strong upward revision vis-à-vis the INE's estimates for 2016, with around seven million more inhabitants at the end of the projection horizon (see Chart 1). In the shorter term, the INE estimates an increase in the total population of almost 4% between 2018 and 2028, which is also well above the previously projected figures. This upward revision also applies to the working-age population (see Chart 2).

Other organisations, such as Eurostat or the Independent Authority for Fiscal Responsibility (AIReF), prepare their own population projections.[2] A comparison of these projections reveals that the INE projections are very similar to those of the AIReF in the first ten years, but then drop below them, as the projection horizon progresses. The difference in population in 2050 is of almost six million inhabitants. Compared with Eurostat, although the INE's population projections are higher over most of the projection horizon, its estimates are somewhat more pessimistic at the end of the horizon, with around 1.5 million fewer inhabitants.

These differences are mainly due to the disparities between the initial underlying assumptions (specifically, those referring to migratory flows and fertility rates, since those relating to mortality rates are very similar) (see Charts 3 to 6). As regards migration, the INE envisages net positive migratory flows over the entire projection horizon, well above the assumptions made in 2016 and in keeping with the recently observed trend in these flows, and also above those projected in the short run by the AIReF, which would be clearly below the most recently published data.[3] In contrast, in the long run, while the INE projects that migration will gradually move towards a net inflow of around 200,000 persons per year, the net migratory flows envisaged by the AIReF[4] are much higher (more than 400,000 persons in 2050). A comparison of Eurostat and INE projections shows that the differences are concentrated in the first 15 years, subsequently converging towards very similar levels.

The INE projects that fertility rates will rise very modestly, from 1.3 children per woman in 2018 to close to 1.5 children which, albeit a slight improvement, is not an abrupt change with respect to the levels observed in Spain in recent years. Both Eurostat and the AIReF make a more optimistic fertility assumption, estimating the average number of children per woman at very close to 2, assuming convergence towards the European average.

Despite the differences in the total population estimates in the various projections analysed, they all envisage gradual and substantial population ageing, which will entail an ongoing increase in the dependency ratio, which is expected to at least double between 2018 and 2050 (see Chart 7). The dependency ratios estimated by the INE and the AIReF are similar for 2050, despite the different fertility and immigration assumptions used. This is explained by the fact that the AIReF assumes a substantially older age distribution of net migration inflows than that underlying the INE projection, which offsets the increase in the working-age population as a result of higher fertility. These differences and similarities indicate that, although long-term population projections are subject to a high degree of uncertainty (in 2050, the 95% confidence bands may widen to nearly 20 pp of the median value, according to

1 The methodology used in this projection exercise assumes a continuation of current demographic trends in fertility and mortality rates and migratory flows. However, some methodological changes have been introduced with a view to obtaining reference values, in the medium and long run, for the relevant demographic parameters (birth rate, mortality rate and migratory flows), on the basis of a survey of a group of experts in demography.

2 The latest Eurostat projections, from February 2017, serve as the basis for *"The 2018 Ageing Report"*, and those of the AIReF were published on 4 October 2018.

3 Corresponding to the first half of 2018, revealing a net positive balance of 121,564.

4 According to the AIReF, its immigration forecasts are based on a gravity model developed by J. Fernández-Huertas Moraga and G. López-Molina (2018), *Predicting Spanish Emigration and Immigration,* AIReF Working Papers, which estimates bilateral migration flows for all countries in the world in the very long run.

Box 4.1

POPULATION PROJECTIONS FOR SPAIN: COMPARISONS AND UNCERTAINTIES (cont'd)

Chart 1
TOTAL POPULATION

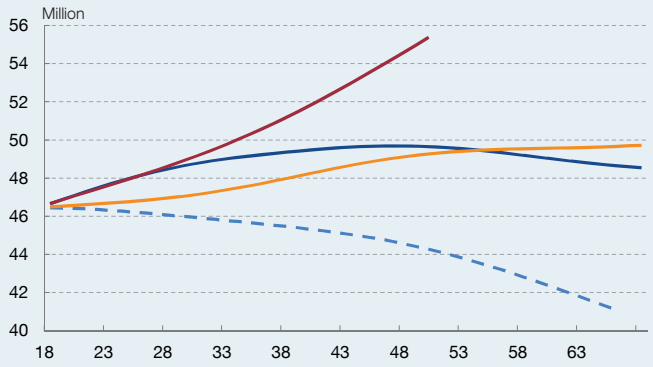


Chart 2
POPULATION AGED 16 TO 66

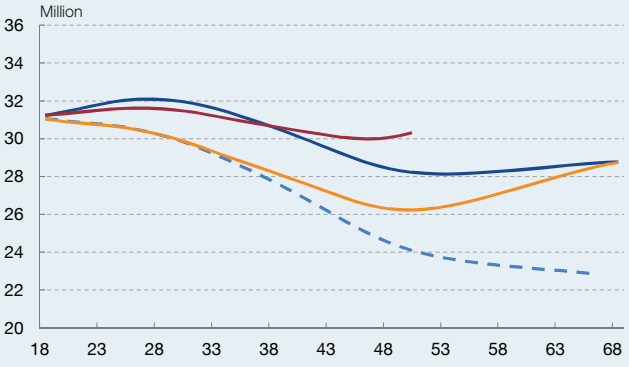


Chart 3
NET MIGRANT INFLOWS

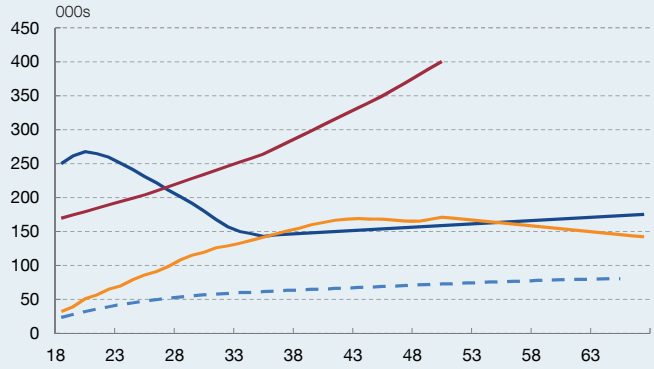


Chart 4
FERTILITY RATE

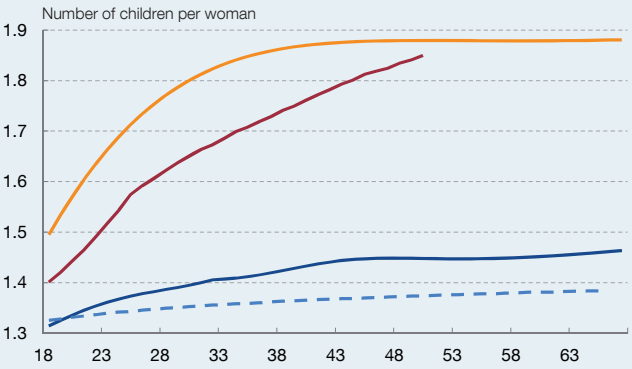


Chart 5
LIFE EXPECTANCY AT BIRTH (MEN)

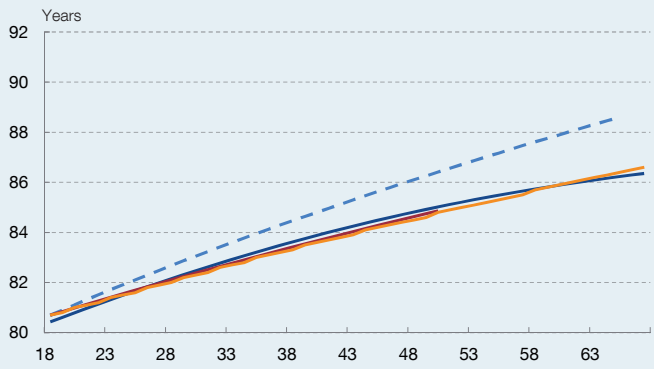
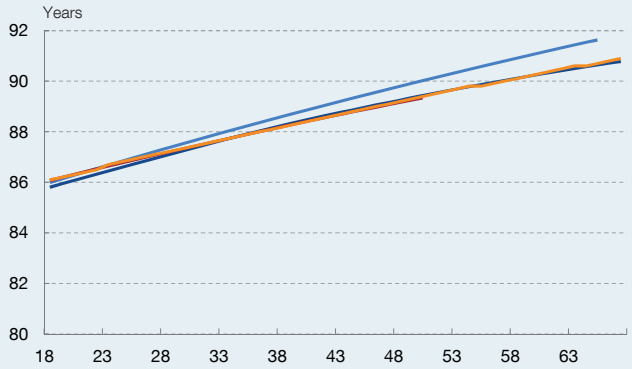


Chart 6
LIFE EXPECTANCY AT BIRTH (WOMEN)



SOURCES: Eurostat, AIReF, INE and Banco de España.

the World Population Prospects of the United Nations) (see Chart 8), the envisaged demographic trends based on a broad range of assumptions all clearly point to substantial population ageing in the medium and long run.

Chart 7
DEPENDENCY RATIO (a)

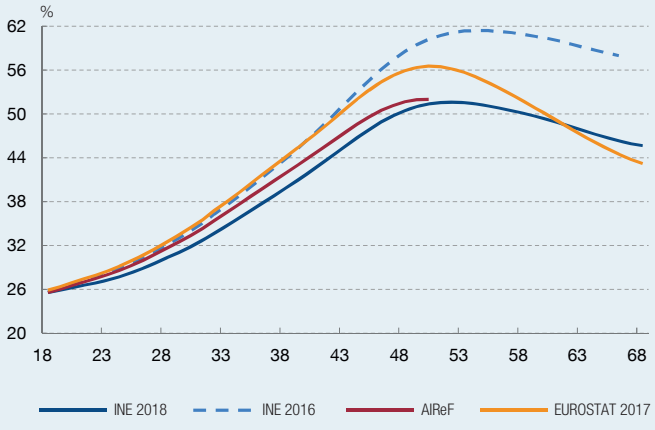
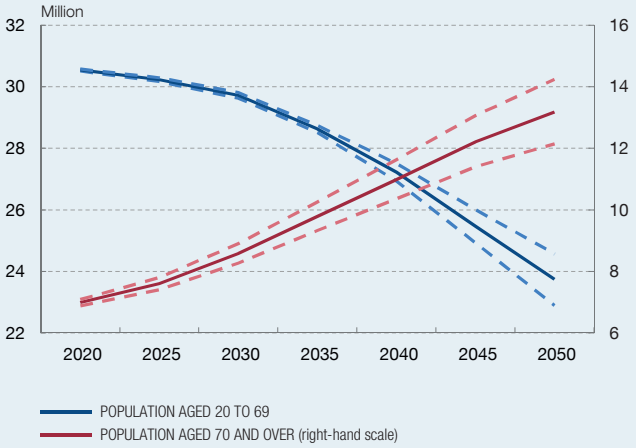


Chart 8
UNCERTAINTY ASSOCIATED WITH POPULATION PROJECTIONS (b)



SOURCES: Eurostat, AIReF, INE, UN and Banco de España.

a Defined as the ratio of the population aged over 66 to the population aged 16 to 66. The 2011 pension system reform established a gradual increase in the statutory retirement age, from 65 to 67 in 2027, at the rate of one month per year between 2013 and 2018, and of two months per year from 2018 to 2027. Given that this box contains projections beyond 2027, the dependency ratio used is consistent with that change.
b The chart depicts the median population projection for each population group. The dotted lines represent the respective 95% confidence intervals.