

ENCONTRO SPE-CIM

DEMOGRAFIA DEMOGRAPHICS

30 de Outubro de 2009

Organizador:

Jorge Miguel Bravo
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Discussant :

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Oradores :

Maria da Graça Magalhães – INE (Statistics Portugal)
Edviges Coelho – INE (Statistics Portugal)
Joana Malta – INE (Statistics Portugal)
António Caleiro – University of Évora, Department of Economics

Local:

Quinta das Lágrimas, Coimbra

PROGRAMA

14H30	Methods and Techniques to Construct Projections of Resident Population: Portugal Maria da Graça Magalhães – Statistics Portugal Edviges Coelho - Statistics Portugal Jorge Miguel Bravo - Universidade de Évora / CEFAGE-UE João Peixoto - ISEG, Universidade Técnica de Lisboa
15H15	Graduation of Mortality Statistics Joana Malta - Instituto Nacional de Estatística Jorge Miguel Bravo - Univ. Évora - Dep. Economia; CEFAGE-UE
16H00	COFFEE-BREAK
16H20	Birth Seasonality in Portugal António Caleiro – Univ. Évora – Dep. Economia
17H05	DISCUSSÃO

Abstracts

Methods and techniques to construct projections of Resident Population: Portugal

Maria da Graça Magalhães – Statistics Portugal

Edviges Coelho – Statistics Portugal

Jorge Miguel Bravo – Universidade de Évora / CEFAGE-UE

João Peixoto - ISEG, Universidade Técnica de Lisboa

Abstract

The purpose of this communication is to present the methodology adopted in the last exercise of resident population projections in Portugal, carried out by the Statistics Portugal.

These population projections are based on the concept of resident population and adopt the cohort-component method, where the initial population is grouped into cohorts defined by age and sex, and continuously updated, according to the assumptions of future development set for each of the components of population change - fertility, mortality and migration - that is, by adding the natural balance and net migration, in addition to the natural aging process. This method, widely used in the elaboration of population projections at national level, allows the development of different scenarios of demographic evolution based on different combinations of likely developments of the components.

The results are conditioned, on the one hand by the structure and composition of the initial population, and on the other, by the different behaviour patterns of fertility, mortality and migration in each set of assumptions about the evolution over the projection period, so it should be emphasize the conditional nature of the results, since it is a method of scenarios of "if ... then ..." in that each combines differently the assumptions outlined for the components.

Given the importance of the projections of individual components to the outcome of the exercise, we proceed to the presentation of the methodologies used in the projection of each of these. The projection of components is carried out using a set of statistical methods, adequate to the background information and the proposed target. Thus in the case of fertility we have modelled the fertility rates using the method proposed by Schmertmann (2003), for mortality we have used the Poisson-Lee-Carter with limit life table proposed by Bravo (2007) and for migration, given the increased fragility of the data and consequently the difficulties regarding the practical application of methods for statistical modelling, was adopted as a initial reference the average of the estimated flows in the last 15 years. Finally, we will present the main results of this exercise, both in regard to components and to the future population.

Graduation of Mortality Statistics

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Abstract

Graduation is an actuarial term that refers to the smoothing of the mortality curve, based on the assumption that mortality evolution obeys to a mortality law. Graduation of gross probabilities of death, obtained through the relation between the number of deaths and the risk exposure, is a consequence of the relative regularity of mortality observed in the population. More generally, graduation procedures include a vast group of methods through which it is possible to adjust an estimated mortality curve to the gross probabilities of death, rendering possible to make statistical inference and applied procedures. We will discuss parametric and non parametric methods for smoothing gross probabilities of death. Special attention will be given to the methodology developed by the Continuous Mortality Investigation Bureau (CMIB) and adopted by Statistics Portugal. This parametric methodology applies a family of functions called Gompertz-Makeham with parameters (r,s) , or GM (r,s) , for graduating the gross probabilities of death. Since the GM (r,s) function is a non linear function, estimation has to be done using Generalised Linear Models (GLM), which are an extension of linear models for non normal distributions of the interest variable, and non linear transformations. Optimization procedures will also be discussed, namely methods of maximum likelihood and minimum Chi-Square. Also statistical tests and procedures to evaluate the quality of estimated solutions will be introduced and discussed. Finally, a brief introduction of methods used for estimating mortality rates at older ages, and the criteria used for deciding the age at which a life table should be closed, will be given.

Birth Seasonality in Portugal

António Caleiro

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Abstract

Portugal is characterised by a noteworthy decline in fertility: a phenomenon that requires some intervention given the costs, namely economic and social, associated with it. Notwithstanding the downward trend in fertility, a careful observation of the data on the number of births in Portugal indicates that there are months where the number of births is clearly higher, as well as others where it seems to be lower. This impression is confirmed by a time series analysis of the data, which shows that, in general, May and September are months where more births take place and that December and February are the months with the lowest figures. This fact is also evident from a prevision of the number of births throughout a whole year, which also shows those two peaks in births. It is particularly important to detect the factors which explain this seasonality in births as demographic policy may manipulate them, leading to an increase in fertility. In particular, the September peak in births, which is the most remarkable result, is shown to be related to end-of-year (economic) expectations.