



## A DEMOGRAPHIC MODEL WITH MIGRATION FOR A PAYG PENSION SYSTEM

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### ABSTRACT

In the analysis of economic and social issues of a country (or any larger or smaller socio-economic unit) the demographic dynamics of the considered population often plays a crucial role. Actual emergencies in this aspect are e.g. pay-as-you-go pension systems, unemployment and state-run healthcare. Over the last decade migration between EU countries also became an important issue, and in recent years the uncontrolled migration into the EU also is a major concern. Therefore, the analysis and better theoretical understanding of the mechanism of development of the age composition of populations interacting via migration is a timely modelling-methodological task. The present paper is a methodological contribution to the support of socio-economic decision making concerning migration issues. It is known that in the framework of the classical age-specific Leslie model, under simple demographic conditions, a closed population in the long term tends to an equilibrium age distribution. In the paper a similar convergence is proved for a system of several populations with migration between them, and this long-term behaviour (convergence theorem) is extended to system of sex-structured populations.

Based on the latter model, medium term projections are also analysed concerning the effect of migration between countries on the development of the old-age dependency ratio (the proportion of pensioners to actives), which is a crucial issue for the sustainability of the pay-as-you-go pension systems in most European countries. Illustrative simulation analysis is carried out with data of three European countries.

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