

Altynay Jazybayeva: Regional population forecast for the Republic of Kazakhstan

Review of the supervisor

The PhD thesis elaborates on regional population forecast for the Republic of Kazakhstan. The results of the projection are projected to be used for territorial planning by local authorities. Therefore, the topic is relevant and beneficial for practical purposes. The objectives consist of analyzing demographic situation with relation to past and current fertility, mortality and migration developments in regions of Kazakhstan and in elaborating on two kinds of regional population projections.

The PhD thesis consists of 131 pages including the annex. The content of the thesis is reasonably designed. The dissertation comprises the analysis of demographic phenomena (mortality, fertility and migration) relevant for making population projections, the description of mathematical approaches needed for using more advanced methods for forecasting and the implementation of final results. It is divided into eight chapters, the introduction and the conclusion. The first chapter focuses on the description of a mathematical background (cohort-component method, multistate approach, and stable population modeling), the second chapter is related to the modeling of mortality, fertility, and migration. Special attention is paid to multiregional forecasting presented in chapter 3. Chapter 4 focuses on the population development of Kazakhstan regions and more specifically with the migration issue. Recent regional trends in fertility, mortality, and migration are presented in chapter 5. The results of multiregional projections are introduced twice (chapter 7 and 8) using two different approaches.

The author, Altynay Jazybayeva, showed the ability to seriously address the topic and to work autonomously. However, the text contains deficiencies, shortcomings and some plagiarisms. I am providing some examples: Subchapter 1.3 is titled "*Stable population theory and weak ergodicity*"; however, no explanation about weak ergodicity is mentioned. Figures 44, 50, 51 are unreadable. Some plagiarism can be detected on pages 26, 27 (the author is not correctly cited). To conclude, Altynay Jazybayeva, has showed during the preparation of her PhD thesis the ability to well delimit the study topics and to work independently. On the other hand, it is a pity that she has not avoided the shortcomings (some of them are listed above) that can be considered by the commission as insurmountable. Therefore, I leave the issue of the final decision in the hand of the whole commission.

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