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REVIEW ON DOCTORAL THESIS

Author: **Cristina Avram**

Title: **Demographic transition, population growth, demographic ageing – interrelations and development contexts at the regional level**

Opinion on the objectives set, the research questions and the overall research draft:

The author has set herself relatively ambitious objectives that are a challenge from the viewpoint of demography and geodemography. The objectives are defined unambiguously and the dissertation clearly poses research questions and hypotheses as well as the working procedure through which the author intends to get answers. Data limitations and the relevance of the research are clearly given in the work. At the same time, the general objective of the work can be denoted as broadly conceived, therefore more difficult to be achieved. The goal of the dissertation is to describe and explain the process of demographic transition (moreover at a regional level), its correlation (and causality?) with demographic ageing. With regard to the required work with data and their calculations, this is undoubtedly a very tough and ambitious goal, which may even exceed the scope common for a dissertation. I would add that there is still much to be examined within the regional analyses of demographic transition. Therefore, I positively assess the focus and objectives of the work.

As far as research hypotheses are concerned, I miss a little their substantiation. Did they build on any empirical knowledge, results of other studies? Perhaps, it would be more suitable to propose the hypotheses at the end of the Literature review - in literature-based discussion. In this way, the hypotheses are presented directly in the introduction, somewhat "separated" from the reality and factual knowledge of older and recent demographic research. For example, if it is assumed that "there is a close link in the fertility decline of populations located in the same geographical region", the foundation for such a hypothesis, either own or that based on previously published studies, should be explained at least briefly. It could equally be proposed an inverse hypothesis about non-relation in local populations. The last remark pertains to hypothesis No. 4 that is partly incomplete. What is the geographic position? From a geographical viewpoint, it is a too vague term.

Opinion on the work structure, interconnectedness, content and quantitative balance of the chapters:

I consider the extent of the dissertation to be adequate as regards its goals. The structure of the work is logical and transparent. I consider the extents of the theoretical, methodological and empirical parts of the work to be accurate and balanced. Three minor critical remarks: two small

subchapters 2.1.3.1 and 2.1.3.2 did not appear in the content of the work. Then, the title of Chapter 2.2 is indefinite; it could be more specified. And finally, Chapter 6.3 should have had also a time specification in its title. But more important is my remark to Chapter "Theoretical framework". I understand the insertion of this chapter in the dissertation, as well as its separation from "Literature review". However, the "Basic concepts" subchapter is essentially only a set of definitions of some known indicators. But natality or elderly population are not "concepts", they are trivial demographic entities. This subchapter can rather be entitled "Basic definitions" or similarly. Moreover, it is unclear whether it is a selection or a complete list of indicators used in the work. For example, life expectancy, ageing from the bottom, ageing from the top and some others are not given here, though they are certainly important for this work. Subchapter 3.2 "Relevant theories" largely repeats the information from the Literature review. There was room enough to extend this chapter, maybe also for some classification of theories, discussing their overlaps and differences.

Work with literature and theoretical background:

As far as the evaluation of the literature devoted to demographic transition (Chapter 2) is concerned, this overview can basically be considered satisfactory. A substantial part of the relevant authors are mentioned here and the assessment is methodical. The total number of titles, their geographical and thematic variabilities are definitely sufficient for a dissertation of this kind. The author quotes correctly and citations from the works are mostly appropriately incorporated into the text. In the analytical-empirical chapters, the discussion and utilisation of literature is more sporadic.

I also have some minor critical remarks, as the theoretical insight is very significant and crucial for interpretations and explanations in the empirical part.

- a) Although one dissertation cannot bring an absolute and complete evaluation, there exist other authors who might have been mentioned - for example, C. P. Blacker, who, like Chesnais, defined five stages of demographic transition.
- b) vôbec nie je spomenutý nárast pôrodnosti v istej skupine rozvojových krajín v začiatkovej fáze demografickej revolúcie, ktoré predznamovali následnú populačnú explóziu. Adequate attention is also paid to developing countries in terms of the types of mortality decline, the rate of decline in fertility and mutual timing of decline in fertility and mortality. However, it is surprising that there is no mention at all of increase in natality in a certain group of developing countries in the initial stage of demographic revolution, which heralded the subsequent population explosion.
- c) More attention should have been paid to such concepts as transition, cycle, revolution in terms of their use and whether or not they can be used as synonyms. The terms "revolution" and "transition" are used in the Czech language too; at least a smaller paragraph could be devoted to them.
- d) In Chapter 2.1.1, four main factors why fertility is "moderately high" in pre-modern societies are listed. Who is the author of these factors? It is not fairly clear whether these factors caused that fertility was not even higher and closer to natural value. What is exactly meant by "moderately high"? After all, this subchapter deals with the period prior to decline in fertility.

- e) The last minor remark concerns otherwise well-elaborated Chapter 2.1.3. The factors of decline in fertility in the 18th or 19th centuries are different from those in the 1970s, and simultaneously different in diverse geographical conditions. When outlining the factors, a clear distinction must be made between those that directly affected the decline of fertility during demographic revolution and those that influenced its further decrease, for example, in NW Europe since the 1960s or in transition countries after 1989. Do all the works mentioned in this chapter relate to the historical decline in the 18th, 19th and early 20th centuries (if speaking of the European context)?

Data, methods, their adequacy and suitability with respect to the objectives set:

Summarily, the dissertation adequately uses sufficiently scientific and sufficiently demanding methodological procedures; moreover they are described in a suitable and extensive manner, especially in Chapters 4 and 5. I appreciate that the author as a foreign student had to deal with the fact that Czech statistical, geographical and demographic realities did not have to be so close to her as to Czech students - particularly in such a conceived work going through centuries and various political and administrative systems. The author immersed herself well in older sources too. The description of data sources, such as censuses, is sufficiently detailed, in some cases perhaps even oversized, but this is not a direct criticism: it depends on the point of view. Analogically, administrative changes in the whole analysed period are processed in a detailed to precise way in Chapter 4.2.

I exceptionally appreciate works on map reconstruction, data-recalculation and data estimation. The author had to handle these purely geographical practices and procedures, and it is an added value for the demographically oriented work. In addition, the recalculation process is well-documented in the appendix with the help of maps. Of course, there also exist various alternative procedures of data estimation applicable in geography, but those used by the author are fully appropriate. If I mentioned that Chapters 4 and 5.1 to 5.3 are very detailed, this does not apply to Chapter 5.4 – Data Analysis. Here, for instance, disadvantages of crude rates, the substantiation of using linear regression rather than other types of regression, the determination of confidence intervals, F-test significance etc. could be mentioned. The author at least presents these aspects directly in the empirical evaluation. Finally, there is a question of the potential utilisation of other statistical methods – such as the factor and cluster analysis or some methods of geostatistics (Theil index, etc.) – and the utilisation of moving averages within the evaluation of time series.

Analytical level, the interpretation of results, their confrontation with literature:

Chapters 6 and 7, included as analytical-empirical, have an adequate extent – they represent approximately half of the work. The series of maps in Chapter 6.3 well illustrate the changes in time. Unfortunately, in the maps there is no frequency of representation of the individual intervals or a population-weighted average. Likewise, the maps depicting the index of growth/decrease of values between individual evaluated years (data are at least in appendices numbered 6..) might be suitable too. Notably in the case of the crude death rate analysed over such a long period of time, also impacts of the age structure as well as the varying intensity of changes in the age structures across the regions have to be taken into account. On the whole, Chapters 6.3 and 6.4 have (expectedly) a

descriptive character, the explanatory element is absent in the text, but objectively this is a very difficult task although it would have the highest added value. However, it would require a detailed knowledge of the historic specificities of regions, regional and cultural disparities, and the excerption of relevant literary sources.

It is appropriate that the author also included Chapter 6.5 dedicated to migration. However, there is missing a more detailed discussion on the impact of migration on natural movement processes and demographic ageing. Net migration informs exclusively about changes in the number of inhabitants, their spatial redistribution, but basically not about changes in the age or educational structures and their subsequent effects on birth and death rates. There are no data on it, of course, but it could at least be discussed. In its current form, Chapter 6.5 is just a simple description of migration balances.

The relative simplicity and descriptive character of Chapters 6.3, 6.4 and 6.5 is compensated by valuable Chapter 6.6 and particularly 6.6.1 within it. Here, the author presents a simple but rational regional classification of districts according to the onset and speed of transition, based on well-known and recognised studies by Chesnais. Perhaps other subtypes could be identified too, but the spatial image in its current form is practically “ideal” and the individual types form almost perfect (ideal) spatially compact regions. Here I have a question - what, according to the author, is the reason that Prague and three North Bohemian regions meet together within Type two? The second question is, how does the author explain the late onset in NW Bohemia? Generally, the issue why the types were formed as shown in the map could have been more discussed. A little more attention could also be paid to confirming the three hypotheses. For Hypothesis 3 (proposed on page 60), the method of measuring spatial autocorrelation could be used. Hypothesis 2 is partly simplified, I suppose that the Czech lands consist not only of Prague, the northern industrial regions and then peripheries.

The evaluation of the age structure of regional populations is precise and detailed. However, when it comes to the period after 1950 and especially after 1989, it would be worth mentioning that changes in the age structure and ageing proper may not be directly related to demographic transition. Socialist and post-socialist development is marked by pro-population measures and then by sharp changes during post-socialist transformation. Demographic transition indubitably affected the initial age-structural momentum in 1950, but further developments were already influenced by other factors than demographic transition. Therefore, if this newer period is also evaluated in the work, current ageing factors should be mentioned as well.

The outcome of empirical endeavour is finding relationships within demographic transition, more specifically between its onset and speed, although statistical dependence is studied in the simplest way possible. The exclusion of populations with dramatic changes because of the German population was a very good step, though the author could have stated whether there were no other significant outliers in the set. I believe that, altogether, more attention could have been paid to the statistical analysis and explanation of findings; for example, at the expense of the described development of ageing indicators above. Then, the demanding preparation of the large demographic database may have deserved the utilisation of other geostatistical methods too. Likewise, from a demographic perspective, perhaps more attention should have been paid to the impact of demographic transition on three individual components of ageing – from the bottom, from the top, and later from the middle of the age pyramid. The various timing and intensity of

decline in fertility and mortality affected the three components to a different extent, which could be discussed more.

Formal level, the level of appendices, language:

The formal aspect of the dissertation is very good without any major shortcomings. The level of appendices, maps and graphs is excellent. The overall layout of the work gives evidence of the author's precision in its preparation. Nor can the language quality be disputed. I noticed only one small thing – if the author uses English names e.g. for Silesia, she could use them also for cities.

Accomplishment of goals and the contribution of the work:

On the whole, I evaluate the dissertation positively despite the above remarks. First of all, I appreciate that the author did not neglect a single important aspect, and she consistently devoted herself to working out hypotheses, data, empirical analysis, synthesis of knowledge. In some parts of the work, she somewhat remained at the level of description; a higher level of explanation would be required here. In any case, she interpreted the acquired data thoroughly and correctly. From the viewpoint of working with literature and the methods applied, the scientific character of the dissertation is certainly at the level required for the Ph.D. thesis, though it may have gone further in the area of statistical analysis. In my opinion, the author fulfilled the set goals and brought new insights into the regional aspects of demographic transition in the Czech Republic. This was also achieved thanks to the laborious processing of large amounts of data from various historical periods and administrative divisions.

In the light of the above-mentioned facts, I highly recommend the submitted work for defense and, after its successful fulfilment, the award of the philosophiae doctor (Ph.D) title.

In Bratislava, August 19th, 2019

Branislav Bleha

Signature: