

Interactive comment on “Climate of migration? How climate triggered migration from Southwest Germany into North America during the 19th century” by Rüdiger Glaser et al.

Anonymous Referee #2

Received and published: 2 September 2017

Review on “Climate of migration? How climate triggered migration from Southwest Germany into North America during the 19th century” by R. Glaser, I. Himmelsbach, A. Boesmeier

General Comments

A very rich, interesting and novel study on the factors, in particular climatological influencing emigration from the south of Germany in the 19th century. Some striking correlations between grain prices and emigration are shown and examples given not only of direct climatic triggers but also of economic factors (speculations in the grain market, financial incentives).

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The methodology is sound as applied to cereal prices and climatic conditions, revealing some interesting political, agricultural and climatic constellations. Sometimes it is difficult to distinguish whether the interpretations are the result of the authors own research, or whether this is derived from existing publications. It would be helpful to add more citations or indicate clearly whether this is your own work.

It would also be useful to mention differentiate more between negative climatic and hydrologic factors such as droughts, as opposed to ice-floods, if present. Also, after having carried out this study, do you presume for the climatic factors that severe winters or cold and wet summers as opposed to summer droughts are stronger triggering factors for emigration?

A shortcoming of the paper is its structure, with parts of the methodology appearing in a piecemeal fashion throughout the paper and as late as the last section before the conclusions. This leaves the reader unaware of the approach applied (and slightly frustrated) until the end. It is advisable to put all methodological descriptions into the methodology (section 3) at the beginning of the paper and put more emphasis on the results and discussion of the results in section 4,5 and 6.

In addition, it would be interesting to find out whether there were any personal diaries or books of migrants detailing their personal reasons for migration, since these may include other socio-economical motivations not listed in the paper that may apply to other sectors apart from “the poor” (e.g. bankruptcy?)

Specific comments

p.1 The introduction is rather short and missing a balanced overview of climatic and migration issues. A discussion of climate issues, in particular what you understand by “Climate and climate variability” should be introduced in the first sentence, then taken up in detail later on. Not all climate variability is negative, from which threshold onwards do you consider them to be negative? Climatic conditions are mentioned only in the last sentence of the introduction without explaining their context. It is essential

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that the reader learns more about which extremes you are dealing with and whether there is an expected difference between “dry, hot” and “wet, cold” (drought, heatwave, frost, excess humidity?). Can you distinguish between climatological and hydrological phenomena e.g. severe winters, as opposed to frozen or flooded rivers?

p. 2 “Climate and climatic variability have been discussed and presented as crucial environmental factors influencing human migration in diverse scientific studies (e.g. Hugo, 1996; Lutz et al., 2002; Hunter, 2005; McLeman, 2013)”. Could you explain in more detail which meteorological phenomena these are related to?

p. 2 “The effect of climatic conditions on population dynamics and societal success and/or failure at different scales during ancient and prehistoric times, including settlement patterns and migration processes”. Can you explain how this influenced settlement patterns? Can you explain which climatic conditions you are considering? Storms? Droughts? Floods? p. 2 Here you mention climatic change for the first time, before you only mention climate variability. Both terms should be introduced at the beginning of the introduction and their differences explained. Please justify why you chose the given term.

Study Area The description of the study area lacks a list of dominant vegetation types and land-use, in particular that related to agriculture.

p. 2 The hypothesis formulated is rather general and logical. “The underlying hypothesis was that emigration in the 19th century was a function of climate and other environmental, as well as economic and socio-political factors.” Would it be possible to weight or differentiate these somewhat?

p. 2 Could you be more precise on what you mean by “The main drivers were considered to be population development itself. . .”?

p. 2 Section 3. It would be advisable to separate the “Working hypothesis” from the “methodological concept”, place the working hypothesis in the introduction and enlarge

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the scope of the methodological concept dedicated only to section 3, mentioning the type of analyses to be undertaken and problems of data availability encountered. Many parts of the methodology are dispersed throughout the paper (in particular section 4) but there are major methodological descriptions as late as section 6 on the second last page of the paper. All of these should be included under section 3.

p. 3 I recommend restructuring sections 4.1 – 4.3. The descriptions of methodology and data sources (migration sources, newspapers etc) in sections 4.1 -4.3 should be placed in section 3. “Methodological Concept”. Even parts of section 5 are methodological (description of data analysis and sources) and should be transferred to section 3. All sentences that should appear earlier in the methodology have been underlined in the pdf.

p. 3 4. The long-term development of population, migration, harvest yields, pricing and climate. This is a purely methodological section and could be placed into Section 3 Methodological Concept as a subsection.

p. 3. Section 4.1 should be re-organised, bringing the methodology and data sources first, then the results.

p. 5 Section 5.1 The first few sentences in this section are methodological and should be transferred to section 3 methodology.

p. 6 It would be useful to outline in more details what exactly was considered in order to standardize the precipitation variable and how the results would have varied if other indicators for temperature and precipitation would have been used.

p. 6 “The positive z-scores in Fig. 7 indicate ‘warmer temperatures’, ‘higher precipitation’, ‘higher crop yields’ and ‘higher prices’ whereas negative values by analogy indicate ‘lower temperatures’, ‘less precipitation’, ‘lower crop yields’ and ‘lower prices’.” How do you cope with the discrepancy between warmer temperatures and higher precipitation as opposed to lower precipitation in the same season in view of heat waves

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and droughts?

p. 6 Did you consider the threshold temperature for the growth of certain cereal crops?

p. 6 Why was the time period from 1804 -1886 chosen? Solely because of emigration?

p. 7 In the very interesting discussion in the second last paragraph on harvest yields in 1816 please add citations and indicate whether the interpretation is derived from Stieffel and Dürr, or the result of your own research.

p. 8 First paragraph. Did you try correlating debts and migration?

p. 8 line 21 Please indicate what the “additional stressors” were in 1816.

Apart from Fig. 7 with the case studies, it would have been interesting to show a graph with the long-term variability of the PSI and STI, distinguishing cold and wet against dry and hot and how the peak emigration years are correlated (or not).

p.10 In general, in how far were famines influential on emigration as compared to grain prices and regulations or financial incentives for emigration?

p. 12 It would be useful to illustrate the above and below average fluctuations for each of the periods analysed in a chronological, annual sequence. As mentioned earlier, Fig. 7 is rather confusing when it comes to combined events (hot and dry), (cold and wet).

p. 13-14, section 6. This section is dedicated primarily to the methodology of statistical analysis and modelling and should be put into the section 3 on methodology. Section 6 can then concentrate on the results and discussion. At the moment the results and discussion of results are very short compared to the methodology.

The English is rather basic and is riddled with errors that require numerous refinements. I have added many linguistic corrections with continuous tracking directly into the text, please read carefully.

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Take care with your figure numbering. It does not correspond to the figure numbers in the text: Fig. 12 instead of Fig. 1, Fig. 13 instead of 2 etc.

I recommend publishing after revision

Please also note the supplement to this comment:

<https://www.clim-past-discuss.net/cp-2017-72/cp-2017-72-RC2-supplement.pdf>

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2017-72>, 2017.

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