

ICHG
WARSAW
2018Climate and agricultural economy
in Early Modern Poland

Monika Kozłowska

kozlmonika@gmail.com Faculty of History and Sociology University of Bialystok, Poland

Introduction

In recent years, both historians and climatologists have drawn special attention to the issues of climate change impact in Central and Eastern Europe. In his famous book about Global Crisis in the 17th century, Geoffrey Parker indicated Polish-Lithuanian Commonwealth as the example of a country which was especially affected by the wars and Little Ice Age.

The Little Ice Age was a climatic period from about 1300 to 1850 during which the lower temperatures occurred in Europe (average annual temperatures fell about 1 degree Celsius). LIA included the least hospitable period for human activity. On the other hand, however, during the beginnings of Little Ice Age throughout Poland, an unprecedented economic and political development took place.

Methods and data

The analyses are based on crop yield ratio of rye, wheat, barley and oats. The data used in the study comes from the inventories of crown estates which embraced approximately 10% of land and at least 15% of total rural population in Early Modern Poland. Application of quantitative methods allowed me to calculate 6,200 rates of crop yields of four grains for around 1,000 granges.

Yield ratio of various crop types in Poland (A) rye, (B) wheat, (C) barley, (D) oats

Note: Coloured spots in the figure are the raw data of crop yield ratio. Black spots present the median, also with the range between the first and the third quartile marked with a black line.

Note: The black line represents the general trend of crop yields ratio (LOESS Regression). The coloured spots present the average crop. The size of the spots indicates whether the average is based on plenty of, or just a few observations.



Crop yield ratio was calculated as follows:

 $Yield \ ratio = \frac{grain \ harvest}{1}$ seed amount

Crop yield ratio is considered as one of the most important indicators of agricultural productivity and economic development in pre-industrial Europe. Yield ratio has been adopted for a number of reasons, mainly on account of the varying of local measures, which excludes an exact measurement in terms of grain output per unit area.

The results

The decline in size of all crop in the second half of the 17th century, and the stagnation in the 18th century was recorded in every figure. The drop was drastic in the 1660s. Only barley crop was higher after falling in the latter half of the 17th century. The yield of the other three types of crops in the 18th century was significantly lower than in the 16th century. Moreover, the oats crop is the smallest of all examined grains.

Map of Poland, with marked granges, for which the crop yield ratio was calculated



Source: own elaboration based on inventories of crown estates

Conclusion

The results of the analysis contradict the thesis that the Little Ice Age contributed to the economic crisis in Poland. The Polish–Lithuanian Commonwealth should have felt the impact of climate changes since the 16th century, which was golden age in the history of Poland.

Until the mid 17th century there is no sign of any impact of climate change on the economy of Poland. It might therefore mean that people could adjust to that. It was not until the second half of the 17th century that the Polish-Lithuanian Commonwealth was experiencing a series of wars, that the society lost its resistance to climate changes caused by the Little Ice Age.