

Climate variation and tourism flows to Tuscany

Mattia Cai*, Roberto Ferrise †, Marco Moriondo†, Paulo Nunes‡

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Abstract

The suitability of a location for a number of tourist activities is largely determined by its climate (snow and skiing, sun and sea,...). Not only does good or bad weather by itself make a location more or less attractive ('direct effects'). Changes in climate affects the quality of the amenities available (e.g. through beach erosion, changes agricultural landscapes, biodiversity loss,...), which in turn impacts the location's appeal as a tourist destination (indirect effects). Regions where tourism and related activities represent a very important source of income can suffer potentially large economic damages as a result of climate change.

This paper presents a fine-scale investigation of the impact of climate on tourist flows to the municipalities – i.e. the smallest administrative units – of Tuscany, one of Italy's 20 administrative regions. With annual tourist arrivals in excess of 10 million in each year after 2005 and growing, Tuscany accounts for about one tenth of Italy's total. While its most celebrated spots are a handful of world-renowned arts-and-culture destinations such as Firenze, Pisa and Siena, the region is quite varied in terms of tourist attractions, as it also hosts popular sea and mountain resorts. Tourism flows to hilly and rural areas are also significant.

The dataset used in the analysis is a panel of Tuscany's municipalities observed annually over the period 2000-2007, amounting to a total of 2,032 observations. It combines information on tourist inflows from official statistics with a rich climate dataset collected in the context of agronomic research within the Ensembles project.

Using a standard panel data framework, we analyze the response of demand for tourism at a given location to variation in climate. Separate analyses are conducted for domestic and foreign tourists, using both static and dynamic specifications. We perform two types of analyses. In the first, the dependent variable is the natural logarithm of tourist arrivals. Yet, tourists can respond to variation in climate not only by deciding whether or not to visit a given location,

*Università di Padova - Dipartimento TeSAF

†CNR-IBIMET, Firenze

‡Fondazione Eni Enrico Mattei, Venezia

but also by choosing how long to stay. In the second analysis, the tourism outcome we study is the (log of) average length of stay. In fact, changed climatic conditions can prompt tourists not only to switch to a different destination or to adjust the length of their stay, but also to shift their vacations in time. While a detailed analysis of seasonality patterns would require data at a greater detail of temporal resolution than those available to us, we try to account for seasonality patterns by including seasonal measurements of key climatic variables (e.g. average winter, spring, summer, and fall temperatures) among the explanatory variables.

Our results indicates that climate variables are significant determinants of tourist inflows both in statistical and practical terms. In general, demand for tourism at a given destination appears to be positively associated with higher spring and fall temperatures, and negatively with winter and summer temperatures. While broadly similar, the results for domestic tourist arrivals and for foreign tourist arrivals do differ in some respects. Notably, the associations between temperatures and tourist arrivals tend to be weaker for foreigners. Also, the effect of the climate on tourist arrivals appears to vary remarkably among destinations offering different types of tourism resources. For example, domestic arrivals respond positively to higher spring temperatures, but the effect is smaller at sea destinations. Similarly, higher summer temperatures reduce arrivals of domestic tourists in art-and-culture, hill and countryside destinations, but have essentially no effect on the costal and mountain areas.

Realistically, what our approach can hope to measure is the direct effects of the climate on tourism. With 8 years of data, it is unlikely that any indirect effects can be detected, let alone separately measured. Furthermore, such long term changes would probably trigger some kind of adaptation on behalf of the tourism sector, and taking that into account would require a more elaborate analysis.