



## Does the Weather matter for Economic Growth? Evidence on Weather Shocks and Anomalies in European Regions

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Climate change is widely perceived as a severe future challenge and has made its way onto many policy agendas. For developing strategies, it is crucial to understand and predict the economic impacts of climate change. In our study we attempt to fill a gap in the literature by performing an aggregate approach with regard to impacts on a subnational level. We empirically investigate whether yearly temperature and precipitation anomalies have affected the economic performance in EU-15 countries on NUTS2-level during 1980-2012. The advantage of this approach is that locally different weather impacts are not smoothed out by spatial aggregation, which might be the reason why several national studies do not find any effects. By analyzing the total effect on regional GDP, we do not require any prior assumptions regarding transmission channels and do not neglect general equilibrium effects and inherent adaptations.

For the sake of comparability, we first use yearly averages of temperature and precipitation as common in other studies and thereby analyze the impact of shocks. However, because of the high spatial and temporal heterogeneity of temperature and above all precipitation we also make use of specific indices that aim to take these variabilities into account. In this way, we focus on anomalies rather than small shocks. By separating contemporary and delayed effects, we examine whether level or growth rates of GDP are affected. Due to the high spatial correlation of economic and weather variables on the NUTS2-level, we employ a SARAR Durbin Panel Model that considers spatial dependences. With this model it is also possible to analyze spillover-effects on unaffected neighboring regions, which might be affected indirectly by suffering regions.

Further steps include the differentiation of effects in rich vs poor and rural vs predominantly urban regions. These investigations might offer hints on potential channels and specific vulnerabilities.