

Simulating the Impact of Climate Mitigation Policies on Social Unrest in Rentier States

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Climate change is widely accepted as a global security topic with strong links to past, present, and future energy use. There is an extensive body of literature on effects of climate change and climate policies. The indirect effects of climate policies, for example on state stability of traditional oil and gas exporting countries, also known as rentier states, has received less attention. We present in this paper how we used System Dynamics models to explore the consequences of uncertainty related to climate and energy policies on the complex global energy system. We, therefore, generated policy related energy price scenarios which we fed into a country stability model, parameterised for Algeria, Azerbaijan, Kazakhstan, Qatar, Russia, and Saudi Arabia. We found that periods with high oil prices may become impossible in the long-term if climate mitigation policies are effective. Lower energy price levels originate in structural system changes caused by climate mitigation policies, and secondarily by the accumulation of over-production of fossil fuels due to declining demand. Buffers in the form of sovereign wealth funds are insufficient to overcome these issues, making all rentier states, but especially the most resource dependent country, Saudi Arabia, vulnerable to climate policies.

Keywords: Climate mitigation policies, Geopolitics, Resource rents, Social unrest, Uncertainty analysis, System Dynamics

1 Introduction

[...]

Climate mitigation policies can be classified into three main strategies for greenhouse gas reduction: increasing the energy efficiency of the economy, increasing the share of renewable energy sources in the energy mix, and capturing and sequestration of greenhouse gas emissions. These strategies, especially the first two, are aimed at structurally changing the global energy system (Van Vuuren et al., 2003). Policy makers and politicians already acknowledged in early climate agreements that these structural changes could have undesirable consequences for traditional oil and natural gas producing countries, sometimes also referred to as 'rentier states' (Mahdavy, 1970).

[...]

In this paper, we try to connect the aforementioned security issues using a modelling and simulation approach in which the proposed policies are treated as uncertainties. First, we want to explore the bandwidth of the impact of climate mitigation policies on oil and natural gas prices. Second, we want to explore how these price dynamics can affect the economies of rentier states. As reduced economic prospects have been linked to increased chances for civil war (Collier & Hoeffler, 2004), we also want to find out under which circumstances climate mitigation policies can lead to increased social unrest. To this purpose, we make use of two System Dynamics (SD) (Forrester, 1961; Sterman, 2000) models, one for exploring the impact of climate mitigation policies on the global energy system, and one for exploring the impact of energy price dynamics on interstate social unrest. This approach builds on research by Auping, Jong, Pruyt, and Kwakkel (2014).

The setup of this paper is as follows. First, we present the general research methodology and explain how we generated price scenarios by exploring the consequences of climate mitigation policies. Second, we provide a concise description of both models used. Third, we present the most important results from our exploration. Finally, we discuss and conclude how climate mitigation policies may impact social unrest and state stability of rentier states.

For the full version of this paper, please contact the first author

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