ECONOMIC POLICY UNCERTAINTY AND RENEWABLE ENERGY INVESTMENT: A COUNTRY LEVEL ANALYSIS

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Overview

Global renewable energy investment continues to decline in real terms and threatens our capacity to achieve energy security and climate change objectives (I.E.A., 2018). While there exists some empirical evidence about the drivers of renewable energy supply (see, for instance, Bloch et al., 2015), inadequate renewable energy investment by the private sector is "a clear indication" that we do not fully understand what drives investors towards renewable investment (Masinia and Menichetti, 2013). However, the influence of policy uncertainty on private financial investment has been documented more generally (see, for instance, Bernanke, 1983). The aim of this study is to shed light on the influence of economic policy uncertainty on renewable energy investment, and why this may differ across countries.

In this study, we examine the impact of economic policy uncertainty on solar and wind investment across a range of countries, including: USA, UK, China, Canada, Australia, Japan, India, Germany, Italy, France, Spain, Mexico, Braxil and Korea. Using monthly data from January 2008 to December 2015, we examine the causal, contemporaneous and lag / lead associations between economic policy uncertainty and investment in solar and wind energy across these 14 countries. We reach the following conclusions. First, economic policy uncertainty generally exhibits an inverse and causal lag / lead association with renewable energy investment. Second, well designed renewable energy policies can mitigate the influence of economic policy uncertainty on renewable energy investment. The results make a valuable contribution to our growing understanding of the drivers of renewable energy investment and are particularly relevant for policy-making aimed at reducing greenhouse gas emissions, achieving energy supply security, decarbonising the value chain and transitioning to a low-carbon economy.

Methods

We first extract the monthly Economic Policy Uncertainty (EPU) index developed by Baker et al. (2016) for each of the sample countries and rebase each country's index to January 2009. Monthly data on investment in solar and wind are extracted from the Bloomberg New Energy Finance (BNEF) database. Nominal amounts (USD) are converted to real values using the U.S. Consumer Price Index (sourced from FRED database). As each time series exhibits a significant amount of volatility, we apply the Hodrick-Prescott filter to extract the trend component of each time series. Market analysis is used to examine the relationship between trends in economic policy uncertainty and solar and wind investment at the country level. We further substantiate these observations by examining the correlation in solar and wind investment against contemporaneous and lagged levels of economic policy uncertainty. Granger causality tests assess whether there exists causal relations between solar and wind investment and economic policy uncertainty at the country level. We fit a polynomial of order 4 to each time series and employ the Bai and Perron (1998) test for 1 to M multiple structural breaks. Finally, market analysis sheds light on the cause and effect of structural breaks in economic policy uncertainty on renewable energy investment, as well as differences in the country level results.

Results

A visual analysis of trends in economic policy uncertainty and investment in wind and solar indicates there is an inverse relationship between solar and wind investment and economic policy uncertainty at the country level. Furthermore, many countries exhibit a strong negative correlation between economic policy uncertainty and solar and wind investment. Granger causality test results also indicate a lag / lead relationship between uncertainty and investment in most countries for both wind and solar. We also find multiple breakpoints in each series and for each country. Interestingly, there is a striking similarity in structural break dates in economic policy uncertainty and wind

and solar investment for many countries. This further alludes to the presence of a lag / lead relationship between economic policy uncertainty and solar and wind investment.

Importantly, there are some notable outliers in the results. We find some countries exhibit a positive association between economic policy uncertainty and investment in wind and / or solar. That is, some countries continue to promote investment in solar and wind despite increasing economic policy uncertainty. This may suggest that well designed energy policy that is characterised by certainty and an intention to promote the transition to low carbon economy can overshadow the influence of economic policy uncertainty. The International Energy Agency's policy and measures database helps shed light on why renewable energy investment in some countries remains strong despite the influence of economic policy uncertainty.

Conclusions

The results generated by this study demonstrate there is an inverse association and causal lag / lead relationship between economic policy uncertainty and investment in wind and solar energy in many countries. However, for some countries we observe that investment in wind and solar energy is resilient to economic policy uncertainty. This suggests that the influence of sound and certain renewable energy policies designed to promote transition to a low-carbon economy can outstrip the influence of economic policy uncertainty. The findings shed light on how country level differences in energy policy design, implementation and certainty can mitigate the impact of economic policy uncertainty in some instances. These findings offer valuable lessons for policy makers attempting to promote the transition to a low carbon economy irrespective of economic policy conditions.

References

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