

Effects of Market Conditions, Environmental Regulations and Regulatory Uncertainty on Investment and Exit *

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Abstract

The coal-fired power plant industry, once representing more than half of the U.S. electricity generation, is a major polluting source of various emissions. Since around 2010, more than one-third of the capacity has retired. The underlying reasons may include both market conditions and government regulations. However, the existing empirical studies have diverse conclusions regarding the relative impact. My study aims to better understand the relative impact of market conditions and government regulations, possibly with uncertainty, on coal-fired power plants' retirement decisions. This study can help guide the government in designing environmental regulations to reduce emissions efficiently. I use a dynamic exit and abatement technology investment model to study coal-fired power plants' retirement decisions. Specifically, my empirical approach consists of a static dispatch model to estimate the annual variable profit for each coal power plant and a single agent dynamic model to estimate the exit costs. With this model, I conduct the following counterfactual analyses to compare the relative impact of each factor on coal-fired power plant retirement decisions: 1) removing certain environmental regulations such as the Mercury Air Toxics Standard; 2) sustaining high natural gas prices; 3) introducing certain new environmental regulations. In addition, the model can predict decisions for each coal-fired power plant, with which we can examine if the responses are spatially heterogeneous.

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1 Introduction

Coming Soon.