

FRUGALS, MILITANTS AND THE OIL MARKET

Etienne Billette de Villemeur, University of Lille, etienne.de-villemeur@univ-lille.fr
Pierre-Olivier Pineau, Chair in Energy Sector Management, HEC Montréal, pierre-olivier.pineau@hec.ca

Overview

The oil market has often been modeled as an oligopoly where the strategic players are producers. With climate change, a new sort of game appeared, where environmental militants play a significant role by opposing some projects, to contain oil production. At the same time, consumers continue to use increasing amounts of oil, independently of oil price fluctuations. Should we oppose oil projects, reduce demand or both? We investigate in this paper the double prisoner's dilemma in which individuals find themselves, with respect to oil consumption and their environmental stance towards the oil industry.

Methods

In many cases, when environmental militants oppose oil projects, they do not directly call for a lower oil consumption from individuals. Greenpeace International, for instance, asks its website visitors to “Join the wave of resistance against pipelines”, but does not advice to use less oil products, to question friends about their vehicle choice or to adopt a frugal energy consumption level (see Greenpeace International, 2019). Maybe they assume that displaying “resistance” is more self-satisfying than not, while reducing oil consumption is too individually demanding. Could it therefore be a better strategy to be an environmental militant than to adopt (and possibly promote) a frugal lifestyle? Of course, the two are separate decisions and can be done simultaneously. But given the price inelasticity of oil demand, supply side strategies of environmental militants may not have the intended results.

This paper attempts to disentangle the different aspects related to the situation. Given the two sets of choices mentioned above, being an environmental militant or not and adopting a frugal level of energy consumption or not, what are the individual and collective outcomes? What are the environmental impacts of these choices, but also the price and welfare impacts?

We offer some answers to these questions, by studying the strategic situations related to the two sets of choices. In both cases, individuals face a prisoner's dilemma: they would be better off with a lower consumption level (because of the global environmental impact) and no opposition to oil projects (because of the lower prices), only if all did the same. But gratification from higher consumption and adopting a militant environmental stance creates incentives to defect.

We develop a simple model, characterize the individual strategies and the market equilibrium. Then we investigate the four polar collective outcomes of the game, and compare their price, quantity (equivalent to the environmental impact) and welfare levels.

Results

While we make some simplifying assumptions, notably that oil demand is strictly price-inelastic (which is not far from the empirical evidence, see Labandeira et al., 2017), our analysis shows that welfare gains come from lower consumption levels. Militancy can be costly and benefit the oil industry in ways that may not be fully understood by oil projects opponents. An assumption on price-elasticity is made for the sake of clarity in the exposition, but would not change the main results if relaxed.

We find that the collective outcome of such game is clearly better when a frugal behavior is adopted, without being militant. The Nash equilibrium, resulting from the individual strategies, leads by contrast to the worst possible outcome: high prices, high consumption and high environmental impact. An effective environmental action should avoid opposing oil supply sources (a costly militant act) and help consumers becoming more frugal..

Conclusions

The double prisoner's dilemma leads, unsurprisingly, to the worst welfare outcome. Demand policies, targeting individual behaviours, or simply individual action to reduce demand, are more effective than supply strategies to improve environmental outcomes. Supply strategies are not only ineffective but are beneficial to the industry by raising its revenues. This is definitely something most environmental militants do not intend.

This paper is a first step toward the analysis of the effects of militancy on oil markets. Further developments could include the assessment of the impact of some elasticity in oil demand on these results and the study of distributional effects of oil price increases induced by militancy. Indeed, many lower income oil consumers already spend a higher percentage of their income on energy, despite using less of it, than higher income ones. They bear a greater cost when oil becomes more expensive and could be collateral victims of environmental militancy. On the other hand, if higher income consumers became more frugal, it would provide both financial and environmental relief to everyone - but especially for the poorest, who are often, also, the most exposed to environmental problems..

References

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