

# RECENT SOCIAL UPHEAVALS AGAINST FUEL PRICE INCREASES: CASE STUDIES AND KEY FACTORS

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## Overview

Over the last three years, spikes in motor fuel prices originated social upheavals in democratic nations revealing a further hindrance to proceed with energy policies. Despite countries' diversity and different pricing policy background, the upheavals have been effective in avoiding the policy aims in the short term. The policy frustration reveals further obstacles that were not previously identified. The traditional regulatory cost-benefit analysis has been proving a net benefit to reduce the high carbon fuel consumption in the transport, sector as a mechanism to avoid climate change troubles. However, it is unable to identify that the price increase also intensifies other short term societal concerns.

Thus, this study investigates the dynamics of selected countries through an evolutionary methodology to shed light on additional risks in the motor fuel price case. On the one hand, the adoption of the evolutionary methodology enlarges the analysis, encompassing broad economic and social indicators influencing in the economic dynamics instead of the final equilibrium as the traditional methodology adopted by the cost-benefit analysis. On the other hand, the investigators' subjectivity influences this methodology since it is impossible to observe all the social and economic indicators. In this case, to avoid subjectivity, it is relevant to highlight that our perspective is strictly economic, an element that avoid this analysis to cover other social or cultural elements influencing the risks in this case.

We chose five countries (France, Brazil, Mexico, Chile, and India) as examples of social upheavals triggered by motor fuel price spikes, to some extent related to political decisions made by local governments or their controlled companies. While France, Chile and Mexico participate in the Organisation for Economic Co-operation and Development (OECD), the other two, Brazil and India represent the emerging countries participating in the BRICS. Additionally, the objectives with the motor fuel prices increase are different among the countries. In France, the increase represents an energy policy aiming to reduce the consumption of hydrocarbons to accelerate an energy transition, clearly connected with an active policy to accelerate the energy transition through price mechanisms. In India and Mexico, the increase is a reduction in the fuel's subsidy, bringing the fuel's prices to parity with the international prices and reducing the subsidy negative impacts in the government budget. Finally, in Chile and Brazil, the increase is a consequence of keeping the international parity in face of the spike of the international fuel prices, associated with a devaluation of the national currency. Despite the difference between the objectives with the increase in the fuel's motor prices, all these countries observed social upheavals based on the price increase.

Finally, we suggest for the regulatory cost-benefit analysis the incorporation of an availability heuristics perspective as a mechanism to evaluate the perception of risk in the society. While the cost-benefit ponders different risks basing on scientific methods, the availability heuristics measures the social perception of risks as well as the discount rate between actual and future risks. In this perspective, as demonstrated by Sunstein (2006), the complex links between the social process associated with the spreading of information ensure that some risks stand out. Additionally, the bounded rationality of the agents also reflects this stand out risks, avoiding rational decision making in the light of the cost-benefit analysis balancing the different risks. Thus, in our view, these countries managed an energy policy increasing the hydrocarbons' prices disregarding the redistributive effects associated with the long and short term risks.

## Methods

We briefly overview the country's energy policy and its historical background, proceeding with a contextualization to introduce the circumstances before the social upheavals. In this case, we utilize a broad source of information like news, expert articles, as well as scientific articles. For the analysis of the key factors, we obtain data from specific sources, mainly the United Nations, the OECD, the International Organization of Motor Vehicle Manufacturers, Bloomberg as well as other specialized literature.

The core analysis consists basically of case studies taking as approach the evolutionary methodology to proceed with this broad exam. According to Witt (1992) and Nelson and Winter (1982) the evolutionary approach is an

opposition to the equilibrium analysis, emphasizing the dynamics' exam encompassing a diversity of determinants influencing the results. Instead of analyzing the long-term equilibrium in the light of the traditional cost-benefit analysis, the evolutionary methodology allows us to exam several indicators amid the selected countries to identify points disregarded by the traditional exam. Observed the historical background among the countries, we discuss their energy policy background as well as their economic conjuncture to delineate the conclusions.

## Results

The analysis of the several data countries following an evolutionary approach demonstrates a converging point among the countries that increased the motor fuel price in these years: a disregard with the redistributive effects of the measure associated with the affordability in the fuel's price.

The key factor values for the selected countries are expressed schematically in Table 1.

	France	Brazil	Mexico	Chile	India
Population (2018)	64.990.511	209.469.323	126.190.788	18.729.160	1.352.642.280
Population (2017)	64.842.509	207.833.823	124.777.324	18.470.439	1.338.676.785
GDP, million, current US\$ (2017)	2.582.501	2.053.595	1.150.888	277.076	2.650.725
GDP per capita (2017)	39.827	9.881	9.224	15.001	1.980
Gini Index	32,7	53,3	48,3	46,6	35,7
Passengers vehicles fleet (2015)	32.000.000	35.471.423	26.937.356	3.125.047	22.468.000
Commercial vehicles fleet (2015)	6.652.000	7.271.901	10.416.238	1.319.894	6.392.000
Carbon intensity of road transport energy consumption, gCO <sub>2</sub> /MJ	67,5	56,3	70,3	71,6	71,7
Gasoline Average Price, current US\$ (Q1 2017)	1,49	1,17	0,96	1,14	1,14
Gasoline Average Price, current US\$ (Q1 2018)	1,85	1,23	1,10	1,33	1,18
Affordability (Q1 2017)	1,43%	4,23%	4,03%	2,96%	21,29%
Affordability (Q1 2018)	1,50%	4,62%	3,92%	2,77%	20,11%
Income Spent (Q1 2017)	0,53%	2,54%	3,86%	1,89%	1,13%
Income Spent (Q1 2018)	0,57%	2,58%	3,82%	1,80%	1,24%
Gasoline Consumption per year per driver, liters (1Q17)	136,2	219,6	350,4	232,2	19,4
Gasoline Consumption per year per driver, liters (1Q18)	137,9	204,0	356,5	238,0	22,6
Last year of regulated gasoline retail prices	1981	2001	2016	1978	2010

Table 1 - Key factor values for the selected countries

Findings suggest that a converging point among the countries is the society incapacity, in the short term, to replace the hydrocarbons, mainly in the lower household revenues. Without any other policy to redistribute the revenue and to reduce the negative influences of the price increase in the households' purchasing power, the net effects have been demonstrating to be regressive. In this case, from the lower households' point of view, the previous investment in technologies locked-in their fuel consumption in hydrocarbons, generating inflexibility in the short term. The historical investigation among the different countries demonstrates a net reduction in the hydrocarbons' fuel affordability, pressing the households' budget and signaling the necessity to change the fuels. However, as they are locked-in, the price increase in carbon fuel is absorbed by the families deteriorating the income distribution, outbreaking a social upheaval.

## Conclusions

Despite the society's concern with climate change, other problems as the revenue distribution and the fuel affordability have to be pondered in an energy policy application. In this context, the access of the energy and the society dependency also have to be combined in the cost-benefit analysis. Finally, considering the necessity to manage an energy policy focusing on reducing the carbon emissions to avoid climate change troubles, it has to ponder the side effects, as the redistributive one. In these circumstances, an improvement in the traditional cost-benefit analysis is the incorporation of the availability heuristics to deal with the eventual risks that the society perceives as higher or more critical.