

# Modeling the Dynamics of Petroleum Price Fluctuations using the System Dynamics Approach

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## Abstract

Despite the introduction of alternative fuel policies to reduce dependency on oil products, petroleum still plays a vital role in global economy with the transportation sector being resilient in shifting away. Fluctuations in the global oil market has been a crucial subject matter where forecasting models have been formulated and analyzed for the global economy. With the rise of petroleum pump price in the last three years, this study aims to formulate a system dynamics model to investigate the global trend of petroleum pump price. The proposed model was developed to provide a framework in understanding the effects of COVID-19 disruption with the decisions of the Organization of the Petroleum Exporting Countries (OPEC) in the production capacity. In addition, the model also seeks to understand the feedback structure regarding the impact of Russia's invasion to Ukraine on the petroleum fluctuation. Three scenarios that depict the least, base, and best cases are examined to investigate the major variable affecting the feedback structures. Although in theory banning oil exports would reduce petroleum pump price in a country, the result suggests that limiting oil exports reduces global supply and, thus, shooting up the pump prices. The results indicates that policies involving global petroleum price cap, alternative resource shifting, and demand curbing from behavioral change are more effective pump price controlling measures.

## Key words

Petroleum , Price Fluctuation model, alternative resource , shifting , feed back structure ,