

Fuel Panics

insights from spatial agent-based simulation

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Abstract

The United Kingdom has twice suffered major disruption as a result of fuel panics first in September 2000 coincident with a wave of fuel protests and more recently in March 2012 following political warnings of possible future supply chain disruption. In each case the disruption and economic consequences were serious. Fuel distribution is an example of a supply chain. Approaches to supply-chain planning based on linear programming are poorly suited to modelling non-equilibrium effects, while coarse-grained system dynamics models often fail to capture local phenomena which contribute to the evolution of global demand. In this Paper, we demonstrate that agent-based techniques offer a powerful framework for co-simulation of supply chains and consumers under conditions of transient demand. In the case of fuel panic crisis, we show that even a highly abstract model can reproduce a range of transient phenomena seen in the real world, and present a set of practical recommendations for policymakers faced with panic-buying.

Keywords Fuel Panics, Agent Based Simulation, Supply Chain

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