

## **Research on Dynamic Price Model Based on Transmission Delay-- taking the petroleum price fluctuation for example**

Topic: Input-output and the network theory

Author: yifang liu

Co-Authors: YUE WANG

Petroleum is a fundamental energy resource. Its price fluctuation is transmitted from the upper-stream to lower-stream industrial chain in the form of price change of production factors, thus causing the price change of final consumption products. Meanwhile, the price fluctuation will be reflected in the price change of the production factors in the upstream industry due to the circulation of the industrial chain. The price transmission path is very complicated because not only it contains both direct and indirect transmission, but also the transmission is always accompanied by various degrees of delay. The input-output price model based on the cost-push theory can efficiently solve the first problem when estimating the impact of price fluctuation on the whole price system. However, the traditional input-output price model cannot reflect the impact of transmission delay, leading to deviation in description of the dynamic relationship between the price and time. To solve this problem, this paper uses the directed weighted network to describe the price transmission among industrial departments and creates a dynamic price transmission model by taking the time dimension into account. This model not only more accurately describes the transmission delay, but also can dynamically calculate the price fluctuation at any time point. On this basis, this paper conducts empirical analysis on the impact of petroleum price fluctuation on the price change of the products of other industrial departments by using the 2007 China input-output data.