Summary of replication project

Title :

An estimation of crude oil import demand in Turkey : Evidence from time-varying parameters approach

Goal and approach:The aim of this article is to model crude oil import demand and estimate the price and income elasticities of imported crude oil in Turkey based on a time-varying parameters (TVP) approach with the aim of obtaining accurate and more robust estimates of price and income elasticities.

Data:This article employs time series data of domestic oil consumption, real GDP, and oil price for the period 1966-2012.

Source: U.S. Energy Information Administration (EIA)

BP Statistical Review of World Energy

Turkish Statistical Institute (TUIK)

The empirical results indicate that both the income and price elasticities are in line with the theoretical expectations. However, the income elasticity is statistically significant while the price elasticity is statistically insignificant. The former shows that crude oil import in Turkey is more responsive to changes in income level and that the imported crude oil is a normal good and rising income levels will foster higher consumption of oil based equipments, vehicles and services by economic agents.

The estimated income elasticity of 1.182 suggests that imported crude oil consumption grows at a higher rate than income. This in turn reduces oil-intensity over time. Therefore, crude oil import during the estimation period is substantially driven by income.

Model and equations:  
time-varying parameters model within state-space model

Measurement equation:

State equation:

Yt: vector of 1\*1, dependent variable, the quantity of crude oil

import observed at time t.

: k\*1 vector, unobserved variables

Xt: k\*1 vector of explanatory variables (constant term, real price if crude oil and real income variable)

: k\*1 vector of constant coefficients to be estimated if any

: k\*k matrix of constant parameters

: error terms

To measure elasticity, we specify the import of crude oil demand of Turkey in logarithmic form: