

# Economic and environmental impacts of energy subsidy reform and oil price shock on the Malaysian transport sector



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## ABSTRACT

This study employs a multi-sector computable general equilibrium model to investigate the long-run impacts of three scenarios, namely high prices of petroleum products, energy subsidy reform and the combine of both, on the Malaysian transport sector. The long-run simulation results suggest that all shocks are beneficial for the entire economy because of the increase in real GDP and investment. The shocks encourage the reallocation of resources and therefore induce disparities in sectoral adjustments. All transport sectors, except water transport, gain from high petroleum prices due to the increase in their domestic output, domestic sales and exports, while they lose from the energy subsidy reform and the combined scenario. The shocks lead to significant changes in travel behaviour of all household types through a change in their use of transport sub-sectors. The combined scenario followed by the high petroleum price shock greatly reduces energy consumption and emissions of all air pollutants in the transport sectors. These findings enhance our understanding of the transport impact of oil price shocks and energy subsidy reform and should be of much interest to scholars, corporate executives, travel agencies, regulators, and policy makers.

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## 1. Introduction

In Malaysia, although the exports of crude oil in compare to the last two decades have decreased significantly, this country still is a net exporter of crude oil (Fig. 1). In this country, the share of exports of crude oil to real GDP in recent years has increased by more than 5%. For example, in 2010, the shares of imports and exports of crude oil to real GDP were 3.3% and 5.5%. It means that a rise in global prices of oil, which increase the value of Malaysian crude oil exports, will increase its GDP as well. Therefore, Malaysia as a net oil exporter country will influence from an increase in world oil prices. With an increase in world oil prices the prices of other fuels such as petroleum products, motor petrol, diesel, and fuel will increase as well. This rise influences the production sector by an increase in the costs of production which leads to a decline in the overall demand for goods and services in the economy.

The Malaysian transportation is the greatest consumer of petroleum products that significantly influences by an increase in the fuel market. This sector approximately consumed over 60% of petroleum products since 1995 (Fig. 2). According to this, the Malaysian transportation sector is a key area of economic growth and development and requires a high level of fuels for future sustainability (Al-Mofleh et al., 2010; Ong et al., 2012). The impact of high oil prices on transport increases transport costs, which changes distribution systems and the ability of existing logistics chains to serve markets.

On the other hand, high oil prices increase government expenditure, especially in those countries that pay subsidies on the consumption of energy carriers. One of these countries is Malaysia that its subsidies began in 1957. Fig. 3 shows that by an increase in international fuel prices the government subsidies will increase. Therefore, the relationship between international energy prices and the amount of subsidy paid to energy consumers is positive and it is not depend on economic growth in this country (Solaymani and Kari, 2014). In 2011, the government subsidies, in compare to the year 2000, have increased dramatically by 541%, while fuel prices have increased by 290%. Increase of 34% in fuel prices in 2008 relative to the previous year led to a

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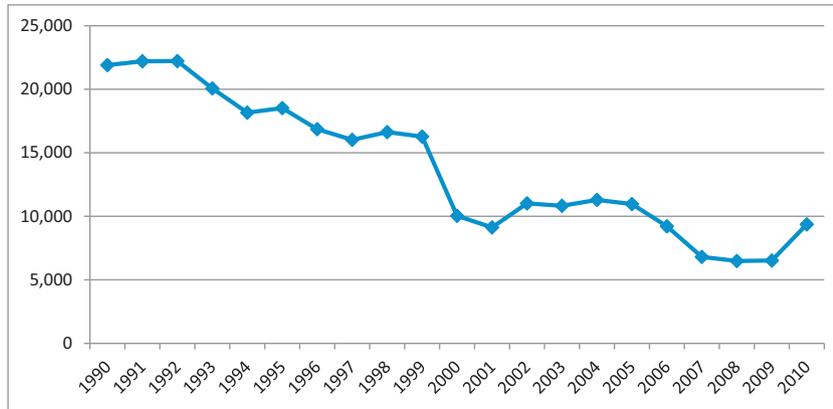


Fig. 1. Trend of net exports of crude oil in Malaysia. Source: National Energy Balance (2011).

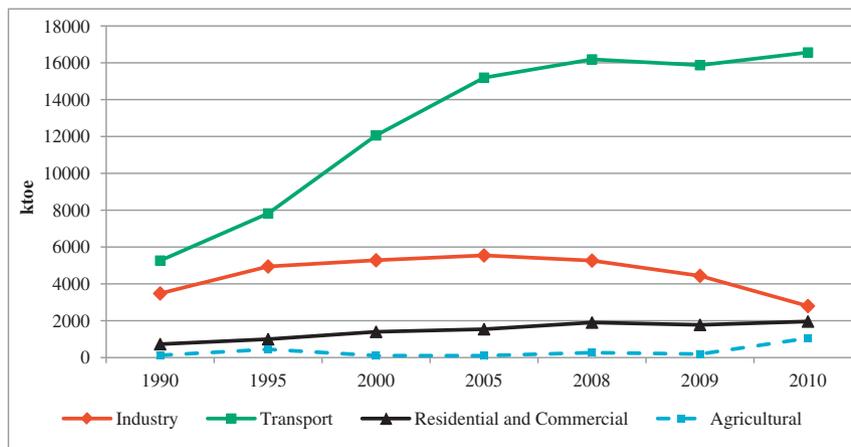


Fig. 2. Total consumption of petroleum products by economic sectors. Source: National Energy Balance (NEB) (2011).

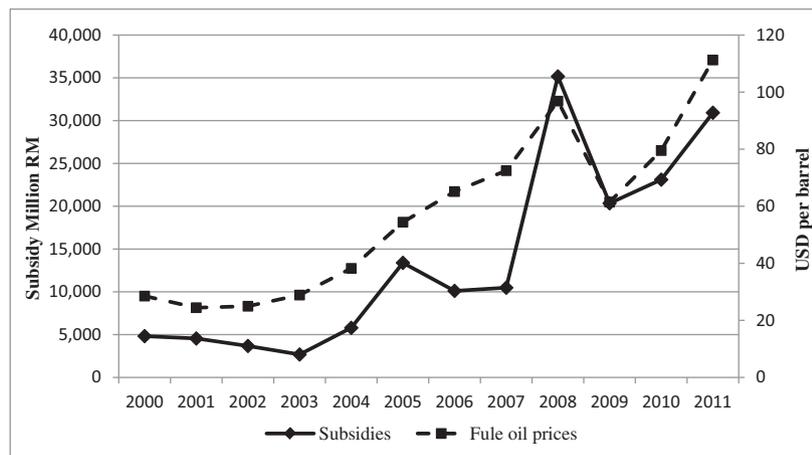


Fig. 3. Relationship between Malaysia's subsidies and international fuel oil prices. Source: EPU.

substantial increase in subsidies of about 235.5%. In the following year, the amount of government subsidies fell significantly by 42% following the dramatic fall (about –41%) in fuel prices. Moreover, in 2011 in compare to 2010, the price of oil increased by about 40% while the government in order to eliminate the negative impacts of this shock on the economy increased the subsidies by more than 57%. Therefore, a fluctuation in energy prices due to the above shocks would influence the fuel intensive sectors such as transport and industries. Moreover, these changes will influence

behaviour of consumers for using transport. Watcharasukarn et al. (2012) showed that high oil prices leads to a change in consumer behaviour resulting a shift on the modes of transport from energy intensive modes to less-energy intensive modes. Sreenivas and Sant (2008) also indicated that rational pricing of urban transport through subsidy reform not only moves people away from private modes to more desirable public modes in Indian cities, but also helps improve the access and mobility of the poorer sections of society and provides more funds for other social expenses.

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