

# **FUEL SUBSIDY REFORM IN MALAYSIA: AN ASSESSMENT ON THE DIRECT WELFARE IMPACT ON CONSUMERS**

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## **ABSTRACT**

*This paper investigates the issue of fuel subsidy reform in Malaysia by analysing the direct welfare impact resulting from fuel subsidy removal. Using the Household Expenditure Survey 2004/2005 with a sample of 4227 households, the analysis is carried out by segregating households into 3 different income groups and the welfare impact due to subsidy cut is measured. The results show that the reduction in welfare due to higher price is larger for the middle 40% compared to the top and the bottom 40%. This is due to the fact that the middle 40% has a larger budget share on fuel. Fuel subsidies are found to be costly in protecting poor households due to substantial leakage of benefits to higher income group but the welfare loss for the lower income group due to subsidy cut is somewhat higher in relative term due to the smaller size of their income. Thus, while subsidy reform is undeniably necessary, our findings suggest that it must be carried out cautiously. Our study suggests that the reform must be accompanied with strategies and programs to mitigate the welfare loss, not only for the lower income but also the middle income group as well.*

**Keywords:** fuel subsidy, direct welfare impact, welfare loss

## **1.0 INTRODUCTION**

Fuel subsidies have long been used in many countries, both developed and developing, to encourage the production of goods and services through lowering the cost of production and in certain cases to lighten the burden of rising prices on consumers. As in other countries, the Malaysian government has been subsidizing fuel products where they are sold below the market price. Evidently, fuel subsidy has made a hole in the country's budget, contributing to the fiscal deficit, which stood at 3.2% of gross domestic product (GDP) in 2007 when the price of petrol was at less than one-half of what it is today. In 2010 alone, the subsidies cost the government nothing less than RM9 billion, equivalent to 4.4% of the total budget.

Due to high cost of subsidies, fuel subsidy reform is on the top agendas of many countries all over the world. Malaysia is among the countries that are implementing such a policy reform. In theory, it is thus proved that, rationalizing fuel subsidies could remove market distortions, improve efficiency in the oil market and relieve the government from its financial burden and fiscal problems. In 2008, the Malaysian Government had decided to reduce the subsidy on petrol due to price hike in the world market which caused pump prices to jump by 40%. Another phase of subsidy reductions for petrol, diesel, and liquefied petroleum gas (LPG) came into effect on 16<sup>th</sup> July, 2010. In a statement, country's Prime Minister's Office said, subsidies for RON95<sup>1</sup> petrol and diesel will be reduced by five cent per liter and LPG by 10 cent a kilogram. RON97 petrol will no longer be subsidized. It will be subjected to a managed float under which the price will be determined by the automatic pricing mechanism. Malaysia also found it necessary to embark on subsidy reform in order for the country to overcome its fiscal challenges and substantiate its support for environmental policies. Perhaps, the Prime Minister has reaffirmed the position of his government on fuel subsidy reforms; though he said the reform will take a gradual process to avoid adverse effects.

The move undertaken by the government to rationalize fuel subsidy has sparked mixed reactions from various segments of the society. Basically the reactions fall under two opposing views. The proponents of fuel subsidy reduction basically argue on the premise of efficiency, i.e. fuel subsidy removal will remove market distortions and thus consumption and investment decisions will be made based on true price signal. On the other hand, the opponents of fuel subsidy removal basically argue on the basis of equity, i.e. the removal of subsidy may adversely affect the lower income groups. Both arguments have their own merits. Nevertheless the appropriate action to be taken entails an in-depth investigation on the impact of phasing out fuel subsidy on the overall welfare of the society. Based on this line of arguments this paper investigates the distributional welfare impact through the direct measure of welfare impact on household resulting from subsidy rationalization. Following the introduction in the first section, section 2 will look at the empirical evidence on fuel subsidy removal. Section 3 will discuss the method and data used in the study followed by analysis of the welfare impact in section 4. Section 5 concludes the study and provides some policy recommendation.

## **2.0 EMPIRICAL EVIDENCES ON FUEL SUBSIDIES REMOVAL**

There are economic arguments for removing fuel subsidies. Some said fuel subsidies are not efficient as they result to distortions in the economy; and also inequitable as the rich people

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<sup>1</sup> The difference between Ron97 and Ron95 is the chemical composition in terms of octane level. The former has higher octane rating which helps engines with higher compression ratios to run very fast.

receive more of the benefits than the poor. Studies have shown that fuel subsidies are ineffective in fuelling economic growth or in ensuring equitable distribution of income. In fact, most of the studies suggest that fuel subsidies hamper economic growth and undermine the principle of equity, therefore should be reduced if not wash out completely. A study on Gabon, by El Said Leigh (2006) revealed that, the richest 10% of the individuals receive about one-third of the total subsidy. Meanwhile, the poorest 30% of individuals receive only 13% of all the subsidies. This shows that the benefit of maintaining low prices is captured mostly by higher income groups, reflecting their large share in total income and consumption. Therefore, fuel subsidy becomes an inefficient instrument for protecting the poor households and ascertaining equity.

Experiences from the countries that implemented the reform have shown a remarkable improvement in social services delivery. For example, Beers and Moor (2001) based on simulation analysis, reported an increase in global welfare of \$35 billion if consumer subsidies in non-OECD countries are removed. Real income for the world as a whole would increase by 0.7% annually while the terms of trade would improve by 0.5% per year. Furthermore, in most countries where energy price reform had taken place, such as in Colombia, Ghana, Indonesia, Turkey and Zimbabwe, GDP growth has been higher than before the reform.

Removing consumer subsidies in eight large non-OECD countries produces efficiency gains and economic growth of 0.7% GDP. In 1998, Russia experienced efficiency gain of 1.5% in GDP and 17% of CO<sub>2</sub> emissions as a result of 33% reduction in fuel subsidies. Similarly, Indonesia had experienced 0.2% efficiency gain in real GDP and 11% reduction in CO<sub>2</sub> emissions due to 28% increase in fuel prices. Venezuela reduced fuel subsidies by 58% and recorded 1.2% efficiency gain in GDP and 26% fall in CO<sub>2</sub> emissions, (Beers and Moor, 2001).

A number of studies confirmed that benefits of fuel subsidies are regressively distributed. Coady et al. (2010) discovered that over 80% of the total benefits on gasoline subsidies go to the richest 40% of households. For diesel and liquefied petroleum gas, respectively, over 65% and 70% of benefits go to these income groups. Evidence has shown that, subsidies, particularly fuel subsidies, are costly when compared to other alternative policies. A recent study on developing countries, conducted by Granado, Coady and Gillingham (2010), shows that, the cost of transferring one dollar to the 20% poorest households via gasoline subsidy is around 33 dollars. They further argued that, if 15 dollars out of every 100 dollars which is allocated to a safety net program is absorbed by administrative costs and 80% of the remaining 85 dollars in beneficiary transfers reaches the poor (or 68% of the total budget), then the cost-benefit ratio for such a program is 1.5 dollars (i.e., \$1/0.68). This shows that the opportunity cost of subsidizing fuel is high and costly. This justifies the subsidy reform embark upon by many countries including Malaysia.

On the other hand, recent experiences in Colombia, Ghana, Indonesia, Turkey and Zimbabwe have shown that, rich households spend a lower proportion of their income on energy than poor income households do. The maximum loss in income for the rich was very small, ranging from 1% to slightly over 3%. In all cases, the biggest losers were poor urban households – the largest users of commercial fuels. Oktaviani et al. (2007) use a CGE model to analyze the elimination of fuel subsidies in Indonesia, for the increased prices of 12% in 2000, 30% in 2001 and 29% in 2005. They concluded that the short to medium-term macroeconomic performance of the economy was impaired by the removal of the subsidies,

due to a reduction in household incomes and increase in domestic prices. Furthermore, the reduction of fuel subsidies increased the overall incidence of poverty in the Indonesian economy from 8.9% to 12.9% of the population, with rural areas worst affected. On the other hand, the authors note that there is little difference in terms of inequality over the period, and declines in household incomes were fairly uniform across income groups (World Bank, 2010a).

Abouleinein et al. (2009) studied the impact of phasing out fuel subsidies in Egypt over a five-year period. Using a CGE model, it shows that the elimination of energy subsidies, without any offsetting policy actions, would reduce average annual GDP growth by 1.4 percentage points over the reference period and depress the welfare levels of households at all levels of the income distribution. However in terms of income inequality, the study also revealed a reduction in the level of inequality among the income groups. This reflects the larger welfare impact on households in the richest quintile of the distribution (World Bank, 2010b).

### 3.0 METHODOLOGY

This study evaluates only the direct welfare effect using partial equilibrium approaches on the assumption that consumers do not shift their demand from fuel despite the price change. This assumption is important because in reality, the fuel price elasticity of demand is very low (inelastic). To determine the welfare effect, households are divided into different income groups and their (groups) shares of expenditure on fuel consumption to their total expenditure are obtained. For each group, the budget share is calculated by dividing the group's fuel expenditure by total group expenditure. Multiplying budget shares by the percentage increase in fuel price gives a first-order estimate of the real income effect of the reform. The equation for calculating the direct effect is given as:

$$D_{eff} = \sum_i \sum_g \frac{\alpha_{ig}}{\varepsilon_{ig}} * \% \Delta P_i^c \dots \dots \text{for the } i^{\text{th}} \text{ refined petroleum product and } g^{\text{th}} \text{ income group.}$$

Where:

- (D<sub>eff</sub>) = the direct effect
- α = household expenditure on fuel (RM)
- ε = total household expenditure (RM)
- %ΔP<sub>i</sub><sup>c</sup> = percentage change in price

The distribution of the welfare impact from a price increase is classified as progressive, regressive or neutral. If the percentage welfare loss increases with household income then it is said to be progressive, but if it decreases with income it is said to be regressive. If it somewhat equals across income group, then it is neutral.

This study uses secondary data which were collected from various sources. Mainly the data came from Malaysian Department of Statistics, as well as ministry of finance. These include; (i) Report on Household Expenditure Survey, Department of Statistic; (ii) Household Income Survey, Department of Statistics; iii) Economic Report, Ministry of Finance.

A sample of 4227 households was considered as the representative of the larger population (i.e. all households in Malaysia). The relevant demographic information of this sample was

used for the analysis. However, the data was from a survey of 2004/2005 which is used as a proxy to evaluate the welfare impact of the present reform. This is because the survey is normally conducted after every five years, at the time of writing; the 2010/2011 survey was not available.

#### 4.0 ANALYSIS OF THE MAGNITUDE OF THE WELFARE IMPACT

The sample used in this study (i.e. 4227 households) is divided into three groups based on the size of their monthly income; i.e. Top 20 percent, Middle 40 percent, and the Bottom 40 percent. The first group has an average monthly income of RM7,328 and RM 3,850 as monthly average expenditure; the second group has an average monthly income of RM2,633 and RM 1,905 as monthly average expenditure; while the bottom 40 percent has an average monthly income of RM1,080 and RM 931 as monthly average expenditure. Table 1 provides more illustrations on the average income and monthly average expenditure of the different income groups. From the table it is showed that the richest 20 percent have the average monthly fuel expenditure of RM306 compared to RM167 for the middle 40% and RM70.5 for the bottom 40 percent. This shows that, the top 20 percent of households in Malaysia received more than 4 times the subsidy received by the bottom 40 percent. This goes in line with the findings of a study conducted by Coady et al. (2006) that the share of the poorest 40 percent of households in the total benefits from fuel subsidies ranges from 15.3 percent for Bolivia to 25.1 percent for Sri Lanka.

Table 1

*Average income and monthly expenditure per group*

<i>Income groups</i>	<i>Average income (RM)</i>	<i>Group Average exp. (RM)</i>	<i>Average fuel consumption per month (RM)</i>	<i>Average general exp. for fuel consumers (RM)</i>
<i>Top 20%</i>	<i>7328</i>	<i>3850</i>	<i>306</i>	<i>4,370</i>
<i>Middle 40%</i>	<i>2633</i>	<i>1905</i>	<i>167</i>	<i>1,976</i>
<i>Bottom 40%</i>	<i>1080</i>	<i>931</i>	<i>70.5</i>	<i>1,004</i>

The information on Table 2 shows that, the household budget share for fuel is 7.5 percent on average. Upon this, the Ron 97 took the highest budget share of 6.9 percent, followed by Ron 95 with 4.8 percent and 2.3 percent for diesel. Table 2 also shows their respective (fuel products) welfare impact from assimilated price increase of 20 percent, 30 percent and 50 percent accordingly.

Table 2

*Budget shares and direct welfare Impacts of fuel price increases  
(In percent of total household consumption)*

<i>Expenditure on fuel item by all households</i>	<i>Budget Share as % of total exp.</i>	<i>Welfare impact on all households from price increase (%)</i>		
		<i>20% price increase</i>	<i>30% price increase</i>	<i>50% price increase</i>
<i>RON 97</i>	<i>6.9</i>	<i>1.40</i>	<i>2.0</i>	<i>3.5</i>
<i>RON 95</i>	<i>4.8</i>	<i>0.96</i>	<i>1.4</i>	<i>2.4</i>
<i>Diesel</i>	<i>2.3</i>	<i>0.48</i>	<i>0.69</i>	<i>1.2</i>
<i>Fuel</i>	<i>7.5</i>	<i>1.5</i>	<i>2.2</i>	<i>3.8</i>

The direct impact of fuel price increase on households' real income depends on the total budget share for fuel products as well as the distribution of expenditure across individual products. Direct fuel products consumption by the households implies consuming fuel for personal end use- which involves, in most cases, for the use of personal vehicle. The data show that diesel is seldom used by the households (only 0.3% of the households studied have expenditure on diesel). This shows that diesel is mainly consumed in production rather than direct consumption. The budget share for RON 97 is about 7 percent of the total expenditure of the households, which is the highest among the fuel products. Increasing the price of this product by 50 percent will negate households' real income by about 3.5 percent. Accordingly, if fuel products' prices are increased collectively by 50 percent, households' real income will fall by about 3.8 percent.

Table 3 presents estimated budget shares on product by income group. The budget shares for fuel as a whole are almost the same for both the top 20 percent and the bottom 40 percent groups (i.e. 0.065 for top 20% and 0.068 for bottom 20%). So, the percentage welfare impact (direct) resulting from fuel price change is almost the same. This implies that the direct impact on households' real incomes of the price increase is the same for both the high and low income groups. From this analysis, it can be seen that hypothetical fuel price increase of 50 percent will equally negate the incomes of both the high and low income groups by the same amount (i.e. 3.5%). What is interesting from the analysis is that it shows for both RON 97 and RON 95 and fuel as a total, the percentage decrease in real income is somewhat higher for the middle quintile compared to the top and bottom quintile. From this, the middle income group is more vulnerable to the effects of the reform than any other group. This is because the budget share of the group on fuel is relatively higher; therefore any price increase will affect their real income most.

In terms of whether the distributional impact of price increase is regressive, progressive or neutral, it shows that the distributional impact of price increase on Ron 95 is regressive; taking away 2.5 percent of real income from the lower income group, but only 2.0 percent from the higher income group (for 50% price increase). This is because the households of the top quintile have a lower budget share on Ron 95. In other words, Ron 95 attracts lower demand from the higher income group. For Ron 97 and diesel, the distribution of the direct impact is slightly regressive as well (3.3 and 3.4) and (1.3 and 1.4) respectively, for an assimilated price increase of 50 percent.

Overall the middle income and the low income group is bound to suffer more if the percentage change in the price is very high ( like 100%), as their income is lower, any reduction in the income will be felt more than does the high income group. For example, taking 100 percent price increase in fuel products and giving same budget share of 7.0 percent; the top 20 percent group with an average expenditure of RM 3,849.8 will lose RM 269.5 of its real income, while the bottom 40 percent group, having RM 931 of average expenditure, will lose RM 65.2 of its real income. For the high income group, the amount represents only 3.7 percent of the group average income, while for the lower income group is 6.0 percent. Given the groups average income of RM 7328 and RM 1080 for the highest and lowest income groups respectively, clearly the lowest income household will obviously have more substantial difficulties absorbing such a large welfare loss given their low initial level of consumption.

Table 3

*Fuel Budget shares and welfare impact by product and income group*

<i>Income groups</i>	<i>Average Expenditure RM</i>	<i>RON 97</i>			<i>RON 95</i>			<i>DIESEL</i>			<i>FUEL</i>						
		<i>Budget share</i>	<i>Direct Welfare impact resulting from price change (%)</i>			<i>Budget share</i>	<i>Direct Welfare impact resulting from price change (%)</i>			<i>Budget share</i>	<i>Direct Welfare impact resulting from price change (%)</i>			<i>Budget share</i>	<i>Direct Welfare impact resulting from price change (%)</i>		
			<i>20% price increase</i>	<i>30% price increase</i>	<i>50% price increase</i>		<i>20% price increase</i>	<i>30% price increase</i>	<i>50% price increase</i>		<i>20% price increase</i>	<i>30% price increase</i>	<i>50% price increase</i>		<i>20% price increase</i>	<i>30% price increase</i>	<i>50% price increase</i>
<i>Top 20%</i>	3,849.8	0.065	1.3	1.9	3.3	0.040	0.8	1.2	2.0	0.025	0.5	0.8	1.3	0.069	1.4	2.1	3.5
<i>Middle 40%</i>	1,905	0.079	1.6	2.4	3.9	0.065	1.3	1.9	3.3	0.016	0.33	0.5	0.8	0.084	1.7	2.5	4.2
<i>Bottom 40%</i>	931	0.068	1.4	2.0	3.4	0.050	1.0	1.5	2.5	0.028	0.56	0.8	1.4	0.070	1.4	2.1	3.5



## 5.0 CONCLUSION

The issue of fuel subsidy rationalisation in Malaysia raises the need to investigate the impact of reducing fuel subsidy on household welfare. While the rationale for reducing subsidy is to ease the financial burden of the government is commonly understood, its consequences on the welfare of the society however remain to be discovered. Here, we investigate the direct impact of fuel subsidy reduction on the welfare of consumers (households). We examine the direct impact of fuel price increase on households' real income based on the total budget share of household on fuel products as well as the distribution of their expenditure across individual products. Besides we also investigate the impact of fuel subsidy removal to different household income group.

Our analysis shows expenditure on fuel took about 7.5 percent of total household expenditure. Disaggregating expenditure by fuel products shows that the Ron 97 took the highest budget share of the consumer expenditure (6.9 percent), followed by Ron 95 (4.8 percent) and diesel (2.3 percent). Our study reveals that the highest proportion of fuel subsidies' benefits goes to the highest top 20% of the income group. Our analysis shows that this group receives more than four times higher in terms of the benefit from subsidy due to higher average monthly expenditure on fuel. Overall, we found that if there is a 50 percent increase of fuel per liter in Malaysia, it will decrease households' welfare directly by about 3.8 percent. Furthermore, we also discover that the Ron 97 has the highest impact of price increase on the household's income. Doubling the price of Ron 97 will negate household's income by an average of 7.0 percent. Interestingly the analysis provides evidence that for both RON 97 and RON 95 and fuel as a total, the percentage decrease in real income is somewhat higher for the middle quintile compared to the top and bottom quintile. It thus proved that the middle income group is more vulnerable to the effects of the reform than any other group.

While our study appears to provide justification for the removal of existing fuel subsidies based on the benefits received from subsidy (where the top 20% benefits more), it thus however shows that the distributional welfare impact on the different segments of the society needs to be tackled accordingly. Our study reveals that the removal of fuel subsidy will hurt the middle income group the most, compared to the lower or the upper income groups. This implies that, while it is important to provide the poorest (or the lower income group) with various types of support to help them maintain a decent standard of living, equally important is for the policy makers to consider strategies and programs to ease the likely burden facing the middle class (middle income group). Besides the rising costs of access to quality education and health that already hurt the middle class (middle income group) in Malaysia, the removal of fuel subsidy will reduce further their standard of living. Hence, our study provides the evidence that the removal of fuel subsidy would likely result in the "middle class squeeze" in Malaysia.

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