AN EMPIRICAL ANALYSIS TO DERIVE THE ESSENTIAL ELASTICITIES FOR ENERGY DEMAND: A CASE IN SABAH AND SARAWAK

YII KWANG JING

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PERPUSTAKAAN

araline

(Assoc. Prof. Dr. Caroline Geetha) Penyelia



Tarikh: 8 Jun 2016

DECLARATION

I hereby declare that the material in this thesis is my own except for quotations, excepts, equations, summaries and references, which have been duly acknowledged.

6 June 2016

Yii Kwang Jing PE20109086



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ABSTRACT

Up to date the Malaysian government has been providing subsidy for various products like energy sources, health, food, education and so on. Among the subsidy given by the government, the most significant amount goes to energy subsidy. Misallocation of resources may lead to over consumption and high national deficit which eventually may lead the country to bankruptcy. However, subsidy cannot be eliminated as long as there is government and the existence of democracy political system. Therefore, the issue that needs to be addressed is to create a mechanism to distribute energy subsidy to the deserving subsidy beneficiaries and not in a blanket basis. This study looks into the impact of subsidy on energy demand in Sabah and Sarawak. Sabah and Sarawak are chosen as the scope of the study due to its difference with Peninsular Malaysia in terms of geographical location, economic activities, affordability, demographic structure and infrastructure. When assessing issues on who are the subsidy beneficiaries, the analysis should be carried out by analyzing the demand for each type of energy based on income groups and location. The demand function was established based on the Linear Approximate Almost Ideal Demand System (LA-AIDS) model. With this, the essential elasticities of demand such as own price elasticity, cross price elasticity and expenditure elasticity was derived. The study found that the energy consumption pattern in Sabah and Sarawak referred to multiple fuel model where all income groups preferred to use combination of energy. Besides, the findings of descriptive analysis showed that largely over consumption of electricity was found among low income group in Sabah meanwhile the over consumption of diesel was highly caused by high income group in Sarawak. The own price elasticity indicated that petrol was price elastic among low income and middle income groups in Sabah meanwhile middle income and high income groups in Sarawak. Besides, diesel was found to be price elastic among high income group in Sabah and Sarawak. For electricity, high income group in Sabah was found to be responsive to the changes to its own price on the over consumption of electricity meanwhile the responsiveness was found among low income and middle groups in Sarawak. In addition, LPG was price elastic for low income group in Sabah and Sarawak. The findings of cross price elasticities ascertained that electricity was a substitution for LPG and diesel. On the other hand, diesel was a complementary for petrol. Furthermore, the integrated expenditure elasticities indicated that petrol was luxury good for low income group meanwhile high income and middle income groups treated petrol as necessity good. Diesel was apparently a luxury good for high income and middle groups meanwhile it was a necessity for low income group. Moreover, electricity and LPG was mostly a necessity good for households in Sabah. In Sarawak, only rural low income and middle income groups treated electricity as necessity meanwhile LPG was a necessity good only for middle income group in urban area. This will help the policy makers to effectively distribute energy subsidy without wastage.



ABSTRAK

SATU ANALYSIS EMPIRIKAL UNTUK MENDAPAT KEANJALAN-KEANJALAN PENTING PERMINTAAN TENAGA: SATU KAJIAN KES DI SABAH DAN SARAWAK.

Sehingga kini, kerajaan Malaysia sedang memberi subsidi untuk pelbagai produk seperti sumber-sumber tenaga, kesihatan, makanan, pendidikan dan sebagainya. Antara subsidi vang diberi oleh kerajaan, jumlah yang paling signifikant diberi kepada subsidi tenaga. Pengalokasian sumber yang salah boleh membawa kepada penggunaan berlebihan dan defisit nasional yang tinggi yang boleh membawa negara kepada keadaan muflis. Walau bagaimanapun, subsidi tidak boleh dihapuskan selagi ada kerajaan dan wujudnya sistem politik yang berdemokrasi. Oleh itu, isu yang perlu diutarakan ialah untuk membentuk satu mekanisma mengalokasi subsidi tenaga kepada penerima subsidi yang layak sahaja dan bukan kepada semua rakyat. Kajian ini menitikberatkan impak subsidi terhadap permintaan tenaga di Sabah dan Sarawak. Sabah dan Sarawak dipilih sebagai skop kajian kerana perbezaannya dengan Semenanjung Malaysia dari segi lokasi geografi, aktiviti ekonomi, kemampuan, struktur demografi dan infrastruktur. Apabila menilai isuisu ke atas siapakan layak menerima subsidi, analysis perlu dijalankan dengan menganalisa permintaan untuk setiap jenis tenaga berdasarkan kumpulan pendapatan dan lokasi. Fungsi permintaan akan dibentuk berdasarkan "Linear Approximate-Almost Ideal Demand System" (LA-AIDS) model. Dengan ini, keanjalan permintaan yang penting seperti keanjalan permintaan harga, keanjalan permintaan silang dan keanjalan permintaan perbelanjaan (pendapatan) dibentuk. Selain itu, hasil kajian deskriptif menunjukkan penggunaan berlebihan elektrik didapati di antara kumpulan berpendapatan rendah di Sabah sementara penggunaan berlebihan untuk diesel disebabkan oleh kumpulan berpendapatan tinggi di Sarawak. Keanjalan permintaan harga menunjukkan petrol itu anjal harga di antara yang berpendapatan rendah dan pertengahan di Sabah sementara kumpulan pendapatan pertengahan dan tinggi di Sarawak. Di samping itu, diesel didapati anjal harga di antara kumpulan berpendapatan tinggi di Sabah dan Sarawak. Untuk elektrik, kumpulan berpendapatan tinggi di Sabah didapati lebih bertindakbalas kepada perubahan kepada keanjalan harga terhadap penagunaan berlebihan di dalam elektrik sementara tindak balas yang lebih didapati di antara yang berpendapatan rendah dan pertengahan di Sarawak. Tambahan lagi, LPG lebih anjal harga di dalam kumpulan berpendapatan rendah di Sabah dan Sarawak. Hasil kajian keanjalan silang membuktikan elektrik ialah pengganti untuk LPG dan diesel. Selain itu, diesel ialah penggenap untik petrol. Tambahan lagi, keanjalan perbelanjaan integrasi menunjukkan petrol ialah barang mewah untuk kumpulan berpendapatan rendah sementara kumpulan berpendapatan pertengahan dan tinggi menganggap petrol sebagai barang normal atau keperluan asas. Diesel dianggap sebagai barang mewah untuk kumpulan berpendapatan tinggi dan pertengahan sementara merupakan barang keperluan asas untuk kumpulan berpendapatan rendah. Tambahan lagi, elektrik dan LPG biasanya barang keperluan asas untuk isi rumah di Sabah. Di Sarawak, hanya kumpulan berpendapatan rendah dan pertengahan yang menganggap elektrik sebagai barang keperluan asas sementara LPG hanya merupakan barang keperluan asas untuk kumpulan berpendapatan pertengahan di kawasan bandar. Ini akan menolong pembuat dasar untuk mengagihkan subsidi tenaga secara efektif tanpa pembaziran.



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