

Do Households Choose Energy-Efficient Air-Conditioners?: Findings from Manila, Cebu and Davao

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1. Introduction

Energy efficiency has emerged as the focal point of climate policies in developing countries, reflecting their rapid economic expansion and population growth. Notably, it is expected to rise in electricity demand within the residential sector (IEA, 2019). Given the increasing demand for electrical appliances, the widespread adoption of energy-efficient appliances becomes crucial.

Among electrical appliances, the demand for room air-conditioners is on the rise in developing countries like China, India, and the Philippines (Salleh et al., 2019; Nakai et al., 2023). However, limited research exists on consumer adoption patterns and their willingness to pay (WTP) for energy-efficient appliances in developing countries.

In this study, with a specific focus on the case of the Philippines, we aim to identify the key attributes that influence consumers' purchasing decisions regarding air conditioners. By utilizing data from a choice experiment conducted in 2022, we estimate the WTP for different attributes of air conditioners. In particular, we emphasize the effectiveness of eco-labels, such as energy efficiency ratings.

2. Methodology and Data

We conducted a face-to-face survey utilizing a choice experiment in three metropolitan areas, namely Manila, Cebu, and Davao, from September 28th to October 7th, 2022. The sample size in each metropolitan area was 150, resulting in a total of 450 respondents.

In the choice experiment, we have incorporated the following four attributes of the air conditioner: the price of the AC (PHP25,000, 30,000, 35,000, 40,000, and 45,000), the country of manufacture (Japan, Korea, China, the US, and the Philippines), additional functions ('no additional function', 'auto-cleaning', 'air purification', and 'smart function'), and energy efficiency rating (a range of one to five stars such as ★, ★★★★★).

3. Results and Conclusion

Using the mixed logit model, we computed the WTPs for each of attributes. Table 1 summarize the main result of our estimation. The brief interpretation are as follows. Regarding the country of manufacturer, we find that all WTPs are negative or not significant, compared to the Philippines manufacturer. This result indicates that respondents strongly prefer domestic products. Moreover, we find that all additional functions have positive and statistically significant WTPs, compared to AC with no additional functions. This result may reflect high

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preferences of cleaning indoor air to prevent COVID-19 infection.

Finally, we find that the energy star ratings have also positive and statistically significant WTPs, compared to the lowest energy efficiency level (★). Moreover, as the energy efficiency level rises, there is a tendency for the WTP to increase. This suggests that despite the higher cost associated with energy-efficient air conditioners, there is still a possibility that they will be selected in the Philippines.

Table 1 The WTPs from the main result (Unit: PHP)

	(1)
Japan	-3109.97
Korea	-13193.66***
US	-4885.42***
Air purification	11637.42***
Auto cleaning	13812.18***
Smart function	11274.55***
★★	6903.73***
★★★	16054.86***
★★★★	25040.17***
★★★★★	33668.15***

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, N=10,800

Furthermore, we investigated which types of respondents has higher WTPs for energy efficient air conditioners. This analysis involved incorporating interactions between the continuous energy star rating variable and various socio-economic variables. Our findings indicate that respondents who completed college, currently own air conditioners, reside with younger children, or have higher household incomes exhibit a greater appreciation for energy-efficient ACs. We also computed WTPs by regions (Manila, Cebu, and Davao), however, there are no significant differences among them.

Reference

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