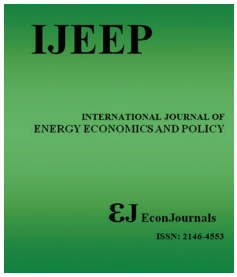

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A Tale of Income and Energy in Rural Areas: What Contributes to People's Happiness? Evidence from Eastern Indonesia

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ABSTRACT

Cash transfers and energy subsidies are two striking programs of the Indonesian government to improve the welfare of poor people. These programs have been in effect for years and altered over time. However, it is unclear that the alterations end up having utility at least at the same level as pre-alteration level. Without a good knowledge on the relative importance of the programs, one may find difficulties in assessing the utility level before and after the alteration. To my knowledge this is the first study to describe the relative importance of income and energy spending where the change may be affected by cash transfers and energy subsidies. The relative importance is anchored at the individual's happiness level as the proxy of the utility level. This study relies on a survey covering 345 respondents residing in rural areas of North Sulawesi Province, Indonesia and cross-section regression models. The findings suggest that every rupiah spent on energy has bigger impacts on happiness improvement than every rupiah received as income. Programs that increase energy consumption may be more important than programs that boost income of people living in rural areas where most poor people are located. Therefore, alteration in one program that can create loss in utility must be compensated by another program that can create gain in utility at least at equal amount, otherwise the alteration is not a pro-poor.

Keywords: Cash Transfers, Energy Subsidy, Rural Individuals, Happiness
JEL Classifications: I32, H53

1. INTRODUCTION

Indonesian poverty rate had gradually declined and reached the lowest rate of 10.12% in September 2017.[1] Among others, cash transfer had been one of two prominent programs of the Indonesian government that contributed to this reduction. Since the initiation in 1999 with the name of social safety-net programs, the cash transfer (CT) programs had evolved from one to another form. Subsequently, it transformed to so-called unconditional cash transfer (UCT) and conditional cash transfer (CCT) programs in 2005 and 2007, respectively. In October 2005, the government provided monthly grants of Rp. 100,000 to households of poor and near-poor families. Initially, the program targeted 60 million people in 15.5 million households, which then covered more than 70 million people in 19.2 million households. However, UCT was seen unsuccessful as the UCT could lead to an increase in unnecessary consumption such as smoking and leisure consumption. Regardless of the level of wealth, the poor individuals spent a substantial amount of money to consume cigarette which made them poorer and unhealthier. In July 2007, the government introduced CCT to cover 500,000 very poor households from 49 districts in 7 provinces. The provinces were West Sumatra, Jakarta, West Java, East Java, Gorontalo, North Sulawesi, and East Nusa Tenggara. It was expected that, by 2015, the CCT could reach 6.5 million very poor households and the cash transfer of Rp. 400,000 would be provided for 4 years for elementary school level and Rp. 800,000 for junior high school level per year. Among others, CCT aims to improve the socio-economic conditions of very poor households and the education

1 http://www.thejakartapost.com/news/2018/01/04/govt-to-strive-for-poverty-rate-below-10-percent.html

level of children from very poor households and to increase access to and quality of education and health services, especially for the very poor households.

The other program of the government was an energy subsidy that had been in effect for decades and increasing in the past year. From 2017 to 2018, the government had allocated an increase in energy subsidy from Rp. 77.3 trillion to Rp. 94.52 trillion, which was a combination of fuel, LPG and electricity subsidies. The fuel subsidy aimed to support the one price policy of the government, while the LPG subsidy aimed to support cooking, lighting and small business purposes replacing the consumption of highly subsidized kerosene. As for the electricity, in 2017, the government subsidized the 900 VA class with a subsidized rate of Rp. 605/kWh for poor households and the 450 VA class with a subsidized rate of Rp. 415/kWh (Frizal, 2017).

A combination of these two programs led to an increase in the welfare of the poor and, at the same time, an increase in national spending. However, the relative importance of these programs was still in debate in the literature and, to my knowledge, there was no study had attempted to examine the relative importance in Indonesia. Instead, energy subsidy was seen as an ineffective program which motivated the idea of using another alternative. Oschinski (2008) argued that CCT could be an alternative to subsidies and be more efficient for four reasons. First, if structural poverty is, at least in part, due to a lack of demand. Second, administrative capacity for proper targeting and the means to monitor and enforce the conditionalities are required. Third, there must have a viable exit strategy to prevent families from falling back into poverty once they become ineligible to participate. Fourth, political will and public acceptance are essential for successful implementation. Salehi-Isfahani (2017) also added that energy subsidies were very costly and could create distortions in the economy of Iran caused by cheap energy. Therefore, maintaining basic income could be an alternative without harming the work incentives. In the implementation, the benefit distribution of energy subsidy was viewed regressive as the program many times benefited the high-income households more than the poor therefore some countries saved the energy subsidy and allocate the savings for cash transfer expansion (Bergaoui, 2016; ESMAP, 2017; The World Bank, 2010; Yemstov, 2010; Younger, 2016). Despite the arguments about whether energy subsidy program is an effective program, the energy studies mostly focus on the distribution and targeting of the energy subsidies, not on the importance of the benefits the poor individuals receive and the relative importance of benefits resulting from the cash transfer and the energy subsidy programs. The knowledge of the relative importance is required when one decides to alter two or more different public programs which in this case are the energy subsidy and/or cash transfer programs. Reduction in energy subsidy must be compensated by other policy that should bring the utility back to the initial level of utility before the subsidy reduction. In other words, the utility earned from a new policy must equal the utility lost due to the subsidy reduction. In addition to equal utility requirement, it is also required that the compensation must be targeted at the right individuals who have suffered the loss in utility. The subsidy reduction affects everyone including the poor. Therefore, there has to be a good assessment on the amount of loss in utility of the poor that is foregone and other policy should be able to compensate the loss in order to make the policies pro-poor.

That said, this study attempts to investigate this relative importance of the benefits generated from having energy and income that go to the individuals residing in rural areas where most poor people live. To my knowledge this is the first study to describe this relative importance. This study focuses on the values that the individuals place on the benefits so the relative importance may be discovered. The relative importance is anchored at the individual's happiness level as the proxy of the utility level. Practically, one way to do it is assessing how individuals value the increase in purchasing power and energy availability using the data of income and energy usage, and examine how income and energy affect the happiness levels of the individuals.

2. LITERATURE REVIEW

One of the Sustainable Development Goals is to end poverty in all its form everywhere (The United Nations, 2018). Among other countries, Indonesia has been seriously dealing with the poverty alleviation. Currently, Indonesia is implementing five programs that directly target the poor. The programs include Program Keluarga Harapan (CCT), Raskin Program (subsidized rice delivery for the poor), free health protection program, financial assistance in education for the poor, and Kelompok Usaha Bersama (social welfare microenterprise group) (Eko et al., 2015). In addition to these five programs, Indonesia runs a UCT program (The World Bank, 2017). The challenge of the UCT program is targeting the right people. In developed countries, the targeted recipients of social programs are frequently accomplished through means-testing or only those with income below certain level categorize as eligible. In developing countries, however, where most potential recipients work in the informal sector and lack verifiable records of their earnings, credibly implementing a conventional means test is challenging (Alatas et al., 2014). Mistargeting of cash transfer program can lead to negative social consequences. Among other consequences, Cameron and Shah (2014) point out that poorly administered cash transfer program increases the prevalence of crime and reduces the participation in community groups in the area where mistargeting takes place. The negative consequences arise after the non-poor receive the benefits of the program.

Despite the challenge, the Indonesian government worked hard to alleviate the poverty by increasing the benefits for the low-income families. For UCT itself, the Indonesian government spent Rp. 9.3 trillion in 2013, Rp. 6.2 trillion in 2014, and Rp. 9.47 in 2015 (The World Bank, 2017) because it believed that UCT packed many benefits. Not only monetary cost, opportunity cost also arises as a large cost for government budget reduces the ability of the government to supply other services such as school and health services (Mccawley, 2010). Literatures have shown that UCT program increases enrollments and reduces dropouts of the low-income family's children for a short-term period (Kilburn et al., 2017). Hjelm et al. (2017) find that cash transfer improves the economic security of the poor. UCT may increase the

happiness of the recipients especially women and their satisfaction regarding their children's well-being (Natali et al., 2018). In some cases, UCT is distributed by the government to reduce the impact of energy subsidy removal (Younger, 2016). In short, UCT aims to compensate the subsidy removal although whether the compensation is enough is still in question. The removal is undertaken because the subsidy takes a large part of government expenditure.

Before the subsidy reform in 2015, the Indonesian government spending for energy subsidy was Rp. 246.5 trillion for fuel and LPG and Rp. 103.8 trillion for electricity (Lontoh et al., 2015; Younger, 2016) in 2014. In 2015, the amount of spending allocated to subsidy decreased to Rp. 81.8 trillion for fuel and LPG and Rp. 76.6 for electricity (IISD, 2018). Align with the energy subsidy reform, Indonesia started to switch the subsidy spending to other type of spending like infrastructure spending. Spending in infrastructure or other productive programs is good for a country but some researchers have shown the negative impacts of the energy subsidy removal. The removal especially in fuel price increases the cost of living and transportation cost (Temidayo et al., 2016). The removal may also increase poverty as the poor also acquires the benefits from the subsidy (Younger, 2016). There is one thing that the government needs to be aware of: Subsidy reform was not an easy program. Countries like Bolivia, Nigeria, and Pakistan did not successfully implement the energy subsidy reform (Salehi-Isfahani et al., 2015).

The energy itself is important and vital for economic growth. Gbadebo et al., (2009) show that the energy consumption has a positive influence on the economic growth, while the consumption has an implicit effect in lagged periods. The consumption also has implicit and explicit effects in the present period of Nigeria's economic growth. While energy is important for growth, energy poverty is the barrier and limitation to the country's ability to be in the path of rapid and sustainable development (Ogwumike and Ozughalu, 2016). The availability of energy may improve the living conditions of the people (Hussein and Filho, 2012). The literatures imply that the benefits decline as the energy consumption decreases. Replacing the energy subsidy with any forms that may increase income or purchasing power needs to assess the loss in happiness resulting from the energy subsidy reduction and the gain in happiness resulting from the rise of the purchasing power.

A large literature has demonstrated the association between the happiness and the rise of income. Happiness becomes one's concern for many reasons where one of which is that happiness has strong correlation with perceived good health (Sabatini, 2014). Different from Natali et al. (2018) that support the positive effect of cash transfer on happiness, Hjelm et al. (2017) find no evidence of cash transfer associated with the reduction of perceived stress by the recipients. Dean (2007) argues that absolute income is not the only determinant of national welfare and individual happiness, relative income is also crucial for happiness.

On the other hand, Ahuvia (2008) argues that many people pursue happiness by earning higher income but there are people that are looking for higher income for something other than the pursuit of happiness. Ahuvia also argues that three motivations behind increased income include (1) to store resources, (2) to be sexually attractive, and (3) to manage our social relationships and our personal identity within those relationships. According to him, the third motivation is the most important influence on desire for increased income past the point where it ceases to increase personal happiness. This argument leads to a thought that if money does not lead people to happiness, there has to be something else. One striking explanation is that not everyone only cares about the increase in absolute income if the increased income is unable to create better social value for the income earner. This is the reason why the expected income and relative income thus the society average income together plays an important role in pursuing happiness (Tsui, 2014). Adler et al. (2017) point out that it is evident that individuals trade-off levels of happiness with levels of income, physical health, family, career success and education in a large sample of UK and US individuals. Additionally, all types of happiness are preferred to other attributes except health and people prefer affective happiness (feeling good) over evaluative (life satisfaction) and eudaimonic (worthwhileness) components.

To sum, increased income does not always lead to increased level of happiness. Some attributes of life can be the reason of the pursuit of increased income. In other words, the happiness gap that individuals experience may not always require an increase in income. Likewise, increased income may not be able to recover the reduction in happiness due to any negative experience of individuals. A switch from energy subsidy to cash transfer or any other welfare benefits may not be a good solution for the low-income families. A study on the relative happiness generated from increased income and energy consumption is necessary. It is unfortunate that no study has ever investigated the association of energy consumption and happiness level nor the relative happiness.

3. DATA, MODEL AND RESULTS

To examine the contribution of income and energy availability on individual's happiness, this study selected 345 representative respondents residing in rural areas of North Sulawesi Province, Eastern Indonesia through a random sampling method. I surveyed any individuals available in a village, the bigger the village the more individuals likely to be available for a survey. The questionnaire that was used for the survey included focused on the demographic characteristics, energy consumption, the access to energy, and market variables. The questionnaire is freely available upon request from the authors.

The respondents include 108 females, 213 males and 24 have no gender information. The respondents' ages range from 15 to 69 years old. There are 13 respondents age from 15 to 24 years old, 52 respondents age from 25 to 34 years old, 90 respondents age from 35 to 44 years old, 104 respondents age from 45 to 54 years old, and 62 respondents age from 55 to 69 years old. There are 294 respondents are married, 20 are not married, while 31 are not responding. Of all, 49.28% work in agricultural-fishery sectors, and 50.72 work in non-agricultural-fishery sectors.

This study groups the variables into four categories, namely, energy variables, pecuniary variables, demographic characteristics, and market variable. The energy variables include energy spending in nominal and percentage of total spending, the energy issue, and distance to access the energy. Pecuniary variables include income in the interval of 1 million rupiahs, monthly spending, and categorical variable of monthly income. The categorical variable defines the monthly income of respondents above mean as one and zero otherwise. The summary statistics in Table 1 presents the number of observation, mean, standard deviation, minimum and maximum values of the variables used in this study. Demographic variables include gender, age, whether living in a city or a regency, education level, marital status, whether working in agricultural-fishery sectors, and whether working in the agricultural sector.

The energy spending in the percentage of total spending is coded from 1 for 0% to 9 for 90% up to 99%, and 11 for 100%. Energy spending in nominal is coded from 1 for Rp. 0; 2 for Rp. 1-1,000,000; 3 for Rp. 1,000,001-Rp. 2,000,000 and all the way to 9 for Rp. 7,000,001-Rp. 8,000,000. Issues in energy is coded 1 if the respondents never experience lack of energy that disrupts the routines of primary job, 2 if once in a year, 3 if once in 6-months period, 4 if once in 3-months period, 5 if once in a month, and 6 if more than once a month the respondent. Gender is coded 1 if male and 0 otherwise. Agricultural-fishery-job is coded 1 when respondents work in agricultural or fishery sectors and 0 otherwise. The agricultural job is coded 1 if working in agricultural sector and 0 otherwise. City-regency is coded 1 if residing in city and 0 otherwise. Age ranges from 15 years old to 69 years old and is coded 1 if below 1-year-old, two if 1-year-old and the code continue accordingly. Education is coded 0 if unable to complete the elementary school or never been to any formal education, 1 if completing elementary school, 2 if completing middle school, 3 if completing high school, and 4 if completing college or university. Marital status is coded 1 if married and 0 otherwise. Income in 1 million intervals is coded from 1 if respondents do not have income; 2 if Rp. 1-Rp. 1,000,000; 3 if Rp. 1,000,001-Rp. 2,000,000; and so forth. Monthly spending is coded 1 if the spending is 0; 2 if Rp. 1-Rp. 1,000,000; 3 if Rp. 1,000,001-Rp. 2,000,000; and so forth. Distance to energy source and distance to market is coded 1 if shorter than 1 km, 2 if 1 km-3 km, 3 if 3 km-5 km, 4 if 5 km-7 km, 5 if 7 km-9 km, 6 if 9 km-11 km, 7 if 11 km-13 km, 8 if 13 km-15 km, and 9 if longer than 15 km from the respondent's home. Monthly income_01 is coded 1 if the income is above the mean and 0 otherwise. All happiness variables are coded from 1 if very unhappy to 9 if very happy.

To examine the relative importance of income and energy on an individual's happiness, I use cross-section regression models. Let the following equation be the structural model predicting the individual's happiness (*Happy*) for individual i = 1., N who is observed at one period.

$$Happy_i = \alpha + x'_i \beta + q_i' \gamma + u_i \quad (1)$$

Where $Happy_i$ is the dependent variable, x'_i is a K-dimensional row vector of income variable or energy variable and q'_i is an M-dimensional row vector of control variables, α is the intercept, β is a K-dimensional column vector of parameters, γ is an M-dimensional column vector of parameters, and μ_i is an idiosyncratic error term. In this study, there are 3 models, namely, happiness level in the family, happiness level with the current job, and happiness level with the current availability of energy. In each model, there are two specifications. Firstly, when x'_i is a K-dimensional row vector of income variable to find out the contribution of additional income on the happiness level of an individual. Secondly, when x'_i is a K-dimensional row vector of energy variable to find out the contribution of additional energy spending the happiness level. The inclusion of these models is to investigate the comparative importance of both variables of interests by subtracting the magnitudes of the parameters of both variables given the same control variables in both models. To find the comparative importance, this study takes the difference between the magnitudes of the energy variable and that of income variable. As mentioned before, while the income is measured by an interval of Rp. 1 million, energy is measured by the energy spending in the percentage of total spending. Multiplying the

Table 1: Summary statistics

Variables	Obs.	Mean	SD	Minimum	Maximum
Energy spending in the percentage of total spending	335	3.827	1.751	1	10
Energy spending in nominal	338	2.456	0.938	1	9
Issues in energy	332	3.943	1.962	1	6
Gender	321	0.664	0.473	0	1
Agricultural-fishery-job_01	345	0.493	0.501	0	1
Agricultultural job_01	345	0.104	0.306	0	1
City-regency	341	0.642	0.480	0	1
Age	321	45.312	11.012	16	70
Education	319	2.028	0.960	0	4
Marital status	314	0.936	0.245	0	1
Income_1 million interval	332	6.657	6.622	1	51
Monthly spending	343	4.367	3.495	2	51
Distance to energy source	340	1.988	1.936	1	9
Distance to market	340	5.132	3.329	1	9
Monthly income_01	332	0.304	0.461	0	1
Happiness in family	340	7.641	1.400	4	9
Happiness with the job	341	6.936	1.717	1	9
Happiness with the energy availability	342	6.597	1.696	2	9

Source: Author's calculation

percentage with the total spending will give monetary unit. Since the measurement units of both variables are relatively similar (i.e., monetary unit), this study does not need to take the difference in standardized coefficients (i.e., the magnitudes) of both variables.

Table 2 shows that the income_1 million interval is positively significant in affecting all happiness level across three types of happiness with magnitude ranging from 0.046 to 0.066. The biggest effect of income goes to the happiness level with the current job, while the lowest effect goes to the happiness level in the family.

The findings suggest that as income increases by 1 million rupiahs, the happiness level in being the family, with the job, and with the energy availability increases anywhere between points 1 to 9 by 0.046, 0.066, and 0.053 respectively. Meanwhile, when there is an increase in the level of energy issue (e.g., from never experience lack of energy which is coded 1 to experiences once a year which is coded 2), the happiness level of each type reduces by 0.095, 0.131, and 0.215 respectively. An increase in monthly spending by 1 level point reduces the happiness level of each type by 0.055, −0.093, and 0.093 respectively. However, when the distance to the energy source increases by 1 level point, the happiness level being in the family and with the job increases by 0.189, and 0.215 respectively. Indeed, the increase in the distance does not significantly affect the happiness level with the energy availability.

Analysing the effect of spending on energy on the happiness provides somewhat different results. Table 3 shows that for every percentage point increase in energy spending, the effect of energy spending on every type of happiness is bigger than its counterpart in Table 1. Unlike in Table 1, the biggest effect goes to the happiness with the current job, followed by happiness in the family and happiness with the energy availability.

After replacing the income variable with the energy variable as shown in Table 3, it turns out that the directions of effects (i.e., the sign of the magnitudes) are still similar to those in Table 2. Unlike the directions that are unaffected, some variables become insignificant in several specifications and are marked unknown in Table 4. Table 4 presents the difference in magnitude of all exogenous variables when income is the variable of interest and when energy is the variable of interest. The positive values below indicate that the magnitudes of the variables when energy is the variable of interest are higher than when income is the variable of interest. The negative values indicate the opposite. The positive difference between the magnitude of energy and income variables shows that the energy availability is more important in improving individual's happiness than income. That said, increasing spending on energy by one percentage point will result in a 0.12-0.144 happiness level higher than increasing income by 1 million rupiahs. Note that the effect on happiness will be a lot higher when energy spending increases by 1 million rupiahs assuming monotonicity preferences because one percentage point in energy spending is modest compared to 1 million rupiahs. Although the difference in magnitudes of income and energy spending is not completely accurate because the measurement unit of income is Rp. 1 million and the unit of energy spending is a lot smaller than Rp. 1 million dues to the percentage of total spending, this study aims to find out which of two variables has the largest magnitude. The accurate difference is not important in this initial study. Shortly speaking, while the measurement unit of energy spending is smaller than income, the magnitude of energy spending is greater than income. Therefore, it is clear that the energy spending has the biggest magnitude. Among all explanatory variables, the difference in magnitudes of income and energy variables is the highest in average while the difference in the magnitude of issues in energy displays the lowest value.

Table 2: Happiness model with income variable

Variables	(1)	(2)	(3)
	Happiness in the family	Happiness with the job	Happiness with the energy availability
Income_1 million intervals	0.046***	0.066***	0.053**
	(0.017)	(0.021)	(0.022)
Agricultural-fishery-job_01	−0.369*	−0.470*	−0.583**
	(0.200)	(0.244)	(0.262)
Gender	0.516**	0.677***	0.404
	(0.200)	(0.243)	(0.261)
Education	0.240***	0.219**	0.191*
	(0.081)	(0.098)	(0.106)
Issues in energy	−0.095**	−0.131***	−0.215***
	(0.040)	(0.048)	(0.052)
Monthly spending	−0.055*	−0.093***	−0.093**
	(0.029)	(0.035)	(0.038)
Distance to energy source	0.189***	0.215***	−0.018
	(0.038)	(0.046)	(0.050)
Distance to market	−0.060**	−0.121***	0.016
	(0.025)	(0.031)	(0.033)
Constant	7.305***	7.041***	7.093***
	(0.305)	(0.373)	(0.399)
Observations	295	295	296
R-squared	0.189	0.215	0.113

Standard errors in parentheses - ***P<0.01, **P<0.05, *P<0.1. Source: Author's calculation

Table 3: Happiness model with energy variable

Variables	(1)	(2)	(3)
	Happiness in the family	Happiness with the job	Happiness with the energy availability
Energy spending in percentage of total spending	0.190***	0.203***	0.173***
	(0.043)	(0.055)	(0.057)
Agricultural-fishery-job_01	−0.499**	−0.516**	−0.761***
	(0.199)	(0.248)	(0.259)
Gender	0.570***	0.715***	0.434*
	(0.194)	(0.244)	(0.254)
Education	0.188**	0.194*	0.147
	(0.079)	(0.099)	(0.103)
Issues in energy	−0.086**	−0.138***	−0.198***
	(0.039)	(0.049)	(0.051)
Monthly spending	−0.003	−0.015	−0.034
	(0.021)	(0.026)	(0.028)
Distance to energy source	0.199***	0.238***	−0.011
	(0.037)	(0.046)	(0.048)
Distance to market	−0.095***	−0.176***	−0.009
	(0.025)	(0.031)	(0.032)
Constant	6.862***	6.572***	6.669***
	(0.321)	(0.410)	(0.423)
Observations	297	297	298
R-squared	0.227	0.245	0.123

Standard errors in parentheses - ***P<0.01, **P<0.05, *P<0.1. Source: Author's calculation

Table 4: Magnitude comparison of happiness model with income and energy variables

Variables	Happiness in the family	Happiness with the job	Happiness with the energy availability
The magnitude of energy spending in percentage of total spending minus that of income_1 million intervals	0.144	0.137	0.12
Agricultural-fishery-job_01	0.13	0.046	0.178
Gender	0.054	0.038	Unknown
Education	−0.052	−0.025	Unknown
Issues in energy	−0.009	0.007	−0.017
Monthly spending	Unknown	Unknown	Unknown
Distance to an energy source	0.01	0.023	Unknown
Distance to market	0.035	0.055	Unknown
Constant	−0.443	−0.469	−0.424

Source: Author's calculation

4. CONCLUDING REMARKS AND POLICY IMPLICATIONS

Income and energy availability significantly affect the happiness level of individuals with the current job. The magnitude of the energy parameter is bigger than that of income. The findings suggest that, towards happiness, individual values the energy availability better than the additional income. In other words, every rupiah spent on energy has bigger impacts on happiness improvement than every rupiah received as income. The data used in this research are energy spending in the percentage of total spending and income in the interval of 1 million rupiahs. That said a 1 percent increase in energy spending is a lot less than an increase in income by 1 million rupiahs. Therefore, assuming that the individual has monotonicity preference over income and energy consumption and given that the energy spending has a bigger effect than income and the measurement unit of energy spending is a lot less than that of income, the energy spending is relatively more important than income in improving individual's happiness level.

The effectiveness of government programs to alleviate poverty is much affected by how individuals value the programs. If the individuals value the program meaningful to their lives, they may get the benefits of the program. Therefore, every rupiah spent in the program will be useful. Government programs include energy subsidy and cash transfer. Alteration in one program that can create loss in utility must be compensated by another program that can create gain in utility at least at equal amount, otherwise the alteration is not a pro-poor. For example, if government decides to reduce the energy subsidy that also reduces the poor's happiness level, there should be a government program that can return the happiness level at least at equal amount of the loss of happiness level. Providing UCT for the poor as the replacement of the energy subsidy may not work if the transfer is made based on the monetary amount.

On the other hand, the CCT is more effective than UCT. Because individuals value CCT better than UCT and spending on energy better than UCT, it can be argued that how individuals value the spending on energy is comparable to how they value CCT.

Government programs to subsidize the energy spending aims to increase the energy consumption by increasing energy spending. Likewise, the effect of energy subsidy on the energy consumption works similar to the effect of CCT that aims to increase the consumption of a particular good. In practice, what makes energy subsidy different from CCT is that the subsidy covers more population than CCT which may increase the likelihood of the non-poor to receive the benefits. Yet, the data of cash transfer and energy subsidies at the individual level is unavailable.

In conclusion, energy is still an important component of the life of the poor individuals, and in fact, increasing energy consumption improves the individuals' happiness level. Therefore, the government should maintain the energy subsidy program with some modifications to ensure that only the poor individuals receive the benefits. Instead of giving the energy subsidy by reducing the price of energy for unrestricted consumers, the government can provide the subsidy in forms of energy (digital or non-digital) vouchers to the recipients of CCT. Relying on CCT itself in helping the poor may be harmful to the individuals as CCT may lead to an increase in disutility due to excessive consumption of a particular good. This study is expected to open a new path on calculating the precise level of utility of individuals that the government needs to be increase to compensate the utility loss due to a reduction in benefit of one program. To do this, one needs to convert the different measurement units of income and energy spending to a similar unit and use the same scale of data, that is, both should be in same level of rupiahs. However, the relative importance is clear that although the energy spending is only a fraction of total spending which is the income, energy spending has bigger magnitude in increasing the happiness level of the individuals than that of income.

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