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The Wellbeing-Consumption Paradox: A Panel Data Analysis in ASEAN Countries

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ABSTRACT

The Esterlin paradox observation shows that income and subjective well-being are correlated at a certain point in time. However, happiness does not increase over a long period of time. On the other hand, income growth is closely associated with an increase in carbon emissions. This leads to risks that drive the climate system to conditions that have consequences for society. This study aims to estimate the relationship between carbon consumption and dimensions of human well-being in ASEAN member states over the period 2014-2021. The relationship between variables is estimated using panel data regression, which shows that carbon consumption has a positive effect on life satisfaction. Meanwhile, GDP per capita is negatively related to life satisfaction. Thus, the Esterlin paradox is still evident to explain the relationship between income and life satisfaction at the country level. The OLS method was run separately to see the influence between variables in a country. Increased carbon consumption in Singapore, Philippines, Laos and Thailand shows a negative relationship with life satisfaction. Meanwhile, the Esterlin paradox is not proven for Singapore and the Philippines.

Keywords: Consumption, CO2, Easterlin Paradox, Life Satisfaction, Well-Being

INTRODUCTION

A person's well-being is measured by the fulfillment of needs in daily life with various determining factors (Pratama, Tamara, & Wahyuni, 2019). These factors can be psychological, social, environmental, emotional, and spiritual (Jowell & Eva, 2009). Actually, aggregate welfare can be measured using the Gross Domestic Product (GDP) approach (Fleurbaey, 2009). Realizing that WHO in 2019 stated that the significance of mental health to the individual's well-being and sustainability has been recognized and part of SDGs (Ng, Ng, Ng, & Ng, 2023). However, Easterlin mentions that income and subjective well-being are correlated at a certain point in time. Happiness does not increase with an increase in income over a long period of time (Esterlin & O'connor, 2020) (Coppola, 2013). This statement is often referred to as the "happiness-income paradox" or the "Easterlin Paradox".

So far, Fanning & O'Neill (2018) said that not many have stated that income growth has a close relationship with an increase in carbon emissions (CO2) (Fanning & O'Neill, 2018). In fact, carbon emissions are an important environmental issue because they have the potential to be a source of the greenhouse effect and depletion of natural resources (Yoro & Daramola, 2020). Nonetheless, there are a number of studies that analyze the relationship between carbon emissions and a number of indicators in objective well-being such as life expectancy (Erdoğan, Yıldırım, & Gedikli, 2019; Yang & Liu, 2018; Matthew, Osabohien, Fagbeminiyi, & Fasina, 2018).

Life satisfaction is a complex term and is used interchangeably with happiness, but both have different concepts (Suganya, 2020). The approach of using life satisfaction measures to see the level of well-being was also carried out by (Fanning & O'Neill, 2018; Sugiawan, Kurniawan, & Managi, 2019; LI & Chen, 2022). Thus, the relationship between life satisfaction and CO2 consumption per capita over time was analyzed. The value of CO2 consumption and national income per capita become alternative proxies for improving welfare based on different characteristics. Hence, the inclusion of income in the analysis as a comparison of results related to the happiness-income paradox.

(Cozzi, Chen, & Kim, 2023) The bottom 10% of global emitters are located in Africa and Asia, which are dominated by developing countries. They consume relatively small amounts of goods and services, and in many cases, access to electricity and clean water is difficult to obtain. (World Resource Institute, 2019), reports that ASEAN countries contribute 7.35% of the total CO2 emissions from around the world with Indonesia contributing 5%. The increase in CO2 emissions increases because countries in ASEAN are in the process of industrialization which requires a lot of energy for the process.

The relationship between happiness and consumption is particularly interesting to study in developing countries. This is because there are changes in consumption patterns due to demographic and lifestyle changes (Jaunky, Jeetoo, & Rampersad, 2019). The increase in the young and productive population adds to the increase in energy consumption (Chen & Mu, 2023; Cong, Zhao, & Li, 2015; Zhu & Peng, 2012; Xiang, Zeng, Han, & An, 2023). It is noted that the population in the Southeast Asian region contributes to 8.09% of the total world population and more than half of them are under 30 years old (Kominfo T. M., 2023). The similarity of community characteristics, on the socio-cultural pillar, shows that ASEAN members have a goal to achieve social welfare (Kominfo, 2023). Social support is an important part of this goal.

Social support can be understood as the subjective perception of emotional, practical, and informational support received through interactions with others (Burešová, Jelínek, Dosedlová, & Klimusová, 2020). In addition, social support is part of subjective well-being (Blasco-Belled, Rogoza, Torrelles-Nadal, & Alsinet, 2020) and can reduce the impact of stressful situations (Khatiwada, Muzembo, Wada, & Iked, 2021). The results of social support affect the sense of happiness and satisfaction with the life lived. However, the contribution of each support provided is different from one another (Bi et al., 2021; Sitte, Huebner, & Hills, 2021; Azpiazu, Agirre, Zabala, & Escalante, 2023).

Price is an important consideration in determining the purchase of a product or service because it is considered an indicator of value. The Consumer Price Index (CPI) is a measurement tool to see changes in the prices of goods and services purchased by households (Niu, 2014). In recent years, the CPI in ASEAN member countries have increased but people's ability to pay is limited. As a result, purchasing power has decreased, which is a factor that causes people to reduce their happiness (Nordheim & Martinussen, 2020). A general increase in the price level causes uncertainty, distress, and fear at the individual level which negatively affects individual life satisfaction (Tella, MacCulloch, & Oswald, 2003; Tella, MacCulloch, & Oswald, 2001; Frey & Stutzer, 2003). Thus, people become concerned about the possibility of increased living costs and the potential for economic and political chaos.

Based on this description, this study aims to estimate the relationship between CO2, GDP per capita, population, social support and consumer price index on life satisfaction in ASEAN member countries. Data limitations in Brunei Darussalam are an obstacle in analyzing the entire ASEAN member countries. Nonetheless, this study makes several contributions. First, it expands the existing literature on the relationship between life satisfaction, CO2, GDP per capita, population, social support and consumer price index in ASEAN member countries. Second, the analysis in one region is novel because of the importance of comparing CO2 to people's life satisfaction and determining its effect on each country.

LITERATURE REVIEW

Well-Being and Consumption

From the beginning, economics understood the relationship between utility or overall welfare and consumption and income (Carver & Grimes, 2016). Adam Smith stated that consumption is the sole and ultimate goal of production. Generally, utility becomes part of the consumption function (direct utility function) or income (indirect utility function). Both require information on prices and income over time as well as wealth. Ultimately, both consumption and income become tools to predict subjective well-being.

The life-cycle hypothesis postulates that consumption at a point in time is not only determined by current income, but also by current wealth and expected future income. This explains that current consumption levels can be used as a better indicator of life satisfaction than current income. (Guven, 2009) Individuals feel happier when they save more, spend less, and are less likely to go into debt. (Alem & Kohlin, 2012) stated that economic status measured using the real per capita consumption expenditure approach significantly increases the level of life satisfaction. Life satisfaction from consumption activities is a subjective assessment of the experience of consuming or managing daily life. This is commonly referred to as consumer life satisfaction, also defined as satisfaction with life as a consumer (Nam, 2019; Nam, 2021; Grzeskowiak, Lichtle, Plichon, & Sirgy, 2015).

Life satisfaction as a consumer in consuming everyday products can have positive and negative impacts depending on the type of goods and brands used. Lifestyle also influence a person's behavior which ultimately determine a person consumption pattern (Siregar & Simatupang, 2022). (Roach, Goodwin, & Nelson, 2019) concluded that high income can buy life satisfaction but not happiness. Life satisfaction is applied by shopping to reduce stress and negative emotions (Kim & Rucker, 2012), buying products that can provide hedonic or luxury encouragement (Clark & Calleja, 2009), and other consumption that encourages increased life satisfaction (Venhoeven, Bolderdijk, & Steg, 2013).

Life Satisfaction and Carbon Emissions

Life satisfaction is meaningful as an assessment of life and feelings in general (Amati, Meggiolaro, Rivellini, & Zaccarin, 2018), being an important aspect of subjective well-being (Fastame, 2021), and refers to the cognitive and overall evaluation of one's life (Meule & Voderholzer, 2020). The theoretical basis for examining the relationship between happiness and well-being was carried out by (Easterlin, 1995), according to which wealth plays an important role in achieving people's life satisfaction. Achieving life satisfaction also includes the environment, energy use, health, subjective factors, and others (Betti, Neri, Lonzi, & Lemmi, 2020) (Apergis & Majeed, 2021) (Kumari, Kumar, & Sahu, 2021).

Most previous studies have focused on western countries, but (Zhang, Pei, Wang, Rokpelnis, & Yu, 2022; Zhu, Ma, Leng, & Nie, 2021; Cheng, Prakash, Smyth, & Wang, 2020; Zhang, Zhang, & Chen, 2017) focused on China and found that life satisfaction is influenced by family factors such as household income, consumption, housing ownership, and air pollution as part of environmental factors. (Zhang, Zhang, & Chen, 2017) emphasized that life satisfaction is reduced through a decrease in happiness status and an increase in depressive symptoms due to increased air pollution, noise, and climate change. However, (Li & Chen, 2022) found that the impact of carbon emissions is directly proportional to life satisfaction. Especially among older people with low education and income levels. This suggests that when the benefits outweigh the costs, using carbon-based energy sources will increase people's life satisfaction despite producing higher CO2 emissions (Piao & Managi, 2023).

Life Satisfaction and GDP

The relationship between happiness and income has been a topic of debate over time. In general, (Easterlin, 1974). Easterlin's (1974) findings suggest that happiness does not increase as income increases. Thus, people tend to compare their income with others or with themselves in the past (Dufhues, Möllers, Jantsch, Buchenrieder, & Camfield, 2023). This means that the happiness gained from an increase in income can be offset if others have also gained a larger increase in income, or if the income received is smaller than expected. Therefore, the national happiness level does not change even if income increases continuously (Easterlin, McVey, Switek, Sawangfa, & Zweig, 2010).

Economic theory supports that money makes people happier. A higher income will increase one's happiness compared to a lower income. As a result, a person will increase his life satisfaction by increasing his income. On the other hand, if public policy aims to increase people's income, then an increase in welfare will follow. (Esmail & Shili, 2017) mentioned, in the context of developed and developing countries and even countries in transition, the positive relationship between happiness and income occurs in the short term. Thus, people with more stable economic conditions have higher levels of happiness.

Possibly aiming to expand the needs of society, economic growth is in fact considered as a means to improve quality of life. A comparison of GDP per capita trends with other objectives such as depression and anxiety, however, revealed that economic growth does not necessarily indicate a better life (Brinton & Mun, 2016) (Sarracino, O'Connor, & Ono, 2021). Countries' well-being is indirectly measured through GDP, which is used as a value of aggregate development. Although there is debate on the use of GDP to measure life satisfaction, it is considered important for scientific and policy-making reasons (Proto & Rustichini, 2012).

RESEARCH METHOD

The use of secondary data in this study comes from various sources. Data on life satisfaction, CO2 and social support were obtained from Our World in Data and the World Happiness Report. GDP and population data were obtained from Worldometer, while the Consumer Price Index (CPI) was obtained from the World Bank. The time period used is from 2014-2021 in 9 ASEAN member countries, which is adjusted to the availability of data in each country. The analysis was carried out using descriptive quantitative using the panel data regression method. The regression model serves to examine the relationship or influence of two or more independent variables on the dependent variable (Gujarati & Porter, 2008). The regression equation in this study is as follows:

$$LS_{it} = \alpha_{0i} + \beta_1 CO2_{it} + ln\beta_2 GDP_{it} + ln\beta_3 Populution_{it} + \beta_4 SocSup_{it} + \beta_5 CPI_{it} + \epsilon_{it}$$

The equation states the model for the relationship between the variables in the study. Life satisfaction was measured using a 0-10 scale, CO2 measured in tonnes per person, GDP per capita measured in dollars, population measured in lives, social support measured in percent, and CPI measured in percent.

If all individual, time, and random noise disturbances are combined into one and follow all the initial assumptions of normally-free and identically distributed random noise, then the use of the GLS method will produce estimates that are best linear and unbiased. This method is known as the Random Effect Model or Error Components Model. However, if all assumptions on the disturbance are not stated to follow the assumption of random noise, then the use of OLS and GLS methods will not provide results that meet the best linear and unbiased properties (Baltagi, 2005). In this way, the inter-temporal disturbances and inter-individual components will be incorporated into the intercept constant of the model. This is what is referred to as the Fixed Effect Model.

Based on this, the best model selection is done by conducting the Chow Test and Hausman Test. The Chow test is used to see the comparison between the Common Effect Model (CEM) and the Fixed Effect Model (FEM). Meanwhile, the Hausman Test looks at the comparison between the Random Effect Model (REM) and the Fixed Effect Model. Furthermore, classical assumption tests in the form of multicollinearity and heteroscedasticity are carried out to fulfill the requirements of regression analysis in the form of best linear and unbiased.

Theoretically, the advantage of using panel data is that the greater the number of observations will provide positive population parameter estimates and increase degrees of freedom, as well as reduce the possibility of collinearity between independent variables. In the linear regression equation model, the error disturbance is always stated to be homoscedastic and serially uncorrelated. Thus, the use of the Ordinary Least Square (OLS) method will produce estimates that are best linear and unbiased. However, these assumptions cannot be applied in panel data. Therefore, the OLS method is used separately to estimate each variable on life satisfaction in each country.

RESULTS

Table 1. Descriptive Statistics (*N* =72)

Construct	Min.	Max.	M	SD
Life Satisfaction	3.819	6.798	5.355	0.729
CO2 per Capita	0.310	9.993	3.196	2.597
GDP per Capita	1109	6166	9975.1	17217.3
Population	5570	2.740	7.240	7.730
Social Support	0.649	0.946	0.806	0.0700
Consumer Price Index	-1.138	9.454	2.655	2.165

Note: M = Mean, *SD* = Standard Deviation.

Table 1 shows that the maximum score for life satisfaction is 6.79 for Singapore and the minimum score is 3.81 for Cambodia. In general, the average life satisfaction in ASEAN countries is 5.35 on a scale of 0-10. Cambodia is the country with the smallest per capita CO2 emission of 0.310, while Singapore produces the most CO2 per capita with a value of 9.99. The average CO2 produced by ASEAN member countries is 3.19 tonnes per person. Singapore's GDP per capita is the largest among other Southeast Asian countries, at 6.166 dollars. While Cambodia only has a GDP per capita of 1.109 dollars.

Indonesia ranks first for its population of 270 million. On the other hand, Singapore only has a total population of 5.5 million. In the social support variable, Laos has the lowest social support among all countries at 0.64 percent. Singapore ranked first with a value of 0.94 percent. Social support indicates the percentage of people who responded that there is someone they can turn to for help in times of need. CPI shows a measure of the average price of goods and services consumed by households. It is usually used to measure the inflation rate in a country. Malaysia became the first country to have a CPI of -1.138 percent or deflation. The highest CPI value of 9.45 occurred in Myanmar.

Table 2. Regression Results

Construct	Coef.	Standar Error	Prob > |t|
Life Satisfaction	-56.11	22.44	0.015
CO2 per Capita	0.093	0.042	0.030
GDP per Capita	-0.525	0.330	0.117
Population	3.749	1.364	0.008
Social Support	-0.097	0.891	0.913
Consumer Price Index	0.045	0.020	0.034

Note: R^2 = .2330 (p < .05).

Table 2 shows the regression results of the best model selection, namely the Fixed Effect Model (FEM). The model was obtained after conducting the Chow Test and Hausman Test with the results of each choosing FEM as the best model. Simultaneously, the variables used have a significant relationship. Meanwhile, partially the variables CO2 per capita, population, and CPI are significant to life satisfaction with a significance level of 5%. The coefficient of determination (R2) value is 0.2330, meaning that the independent variables used can explain the dependent variable by 23.30 percent. The remaining 76.70 percent is influenced by other variables not included in the model.

The relationship between CO2 per capita and life satisfaction is positive. An increase in CO2 produced by countries in Southeast Asia by 1 tonnes per person will increase life satisfaction by 0.093 points. GDP per capita has a negative influence on life satisfaction. Increasing a country's GDP by 1 dollar decreases life satisfaction by 0.525 points. Population has a positive effect on life satisfaction. An increase of 1 person will increase life satisfaction by 3.749 points. Social support has a negative effect on life satisfaction. Which when there is an increase in social support between people in a country, it decreases life satisfaction by 0.0974 points. CPI as a description of price changes shows a positive relationship to life satisfaction. a 1 percent increase in CPI will increase life satisfaction by 0.452 points.

DISCUSSION

In the time period used, when countries are compared, welfare and consumption seem to be related. However, it is only up to a certain point that more consumption makes only a small contribution to welfare. (Fanning & O'Neill, 2018) (Kerschner, 2010) (Raworth, 2017) argue that rich countries are past the point where significant resource use has led to a decline in welfare. Thus, it now provides space for countries classified as poor to increase consumption to meet basic needs. Most countries with rising incomes and CO2 emitters are relatively low-welfare countries. In addition, it can be said that these countries benefit the most from increased consumption.

In the case of ASEAN countries, the increase in CO2 in some countries has an influence on life satisfaction. Such as in Indonesia, Vietnam, Myanmar, Cambodia, and Malaysia where these countries show positive results. This means that increasing CO2 consumption is directly proportional to the life satisfaction felt by its people. (Rao & Bear, 2012) found a positive relationship between life satisfaction and CO2, which concretely shows that increased energy use and emissions are necessary to provide a decent standard of living for people in the country. On the other hand, Singapore, the Philippines, Laos, and Thailand show inverse results. The increase in CO2 in fact results in a decrease in life satisfaction. In line with this, (Betti, Neri, Lonzi, & Lemmi, 2020) (Zhang, Zhang, & Chen, 2017) (Li & Chen, 2022) state that increased energy use and emissions result in decreased life satisfaction and happiness. The cause is increased anxiety and concern about the possibility of not being able to adapt or take refuge in the climate crisis due to carbon emissions.

The Easterlin Paradox in this study is evident in 7 out of 9 ASEAN member countries. The increase in GDP per capita was not followed by an increase in the welfare of the people. Throughout the study period, only Singapore and the Philippines showed no Easterlin Paradox. This is in accordance with classical economic theory and research (Putri & Prasetyani, 2021) (Nursyiana & Badriyah, 2022) (Rahayu, 2016) which states that an increase in income earned by a person will increase the chances of his subjective welfare level.

Population indicates the density of people who inhabit a place. In general, population density is negatively related to life satisfaction (Brown, Fonberg, Schellenberg, & Yang, 2021). Estimation results for Myanmar, Thailand, Cambodia, and Malaysia show that population is negatively related to life satisfaction. In line with these results, (Berry & Okulicz-Kozaryn, 2009) found that life satisfaction is lower in big cities than in rural areas. (Li & Kanazawa, 2016) (Cao, 2016) (Ala-Mantila, Heinonen, Junnila, & Saarsalmi, 2018) found a negative relationship between population and life satisfaction caused by the environment.

Social support has a negative effect on life satisfaction in Singapore, Vietnam, Laos, and Malaysia. The high level of social support from the closest person actually reduces the level of life satisfaction. This is due to the individual attitude that began to develop among the community. Lack of socializing and decreasing levels of trust make individuals feel less trust in the people around them. In the CPI variable, Indonesia, Singapore, the Philippines, and Thailand have a negative relationship with life satisfaction. An increase in the price of goods will reduce life satisfaction. This is because people's purchasing power has decreased due to price increases. Thus, life needs cannot be met optimally and reduce life satisfaction.

CONCLUSION

The Esterlin paradox observation shows that income and subjective well-being are correlated at a certain point in time. However, happiness does not increase over a long period of time. On the other hand, income growth is closely associated with an increase in carbon emissions. This leads to risks that drive the climate system to conditions that have consequences for society. This study aims to estimate the relationship between carbon consumption and dimensions of human well-being in ASEAN member states over the period 2014-2021. The relationship between variables is estimated using panel data regression, which shows that carbon consumption has a positive effect on life satisfaction. Meanwhile, GDP per capita is negatively related to life satisfaction. Thus, the Esterlin paradox is still evident to explain the relationship between income and life satisfaction at the country level. The OLS method was run separately to see the influence between variables in a country. Increased carbon consumption in Singapore, Philippines, Laos and Thailand shows a negative relationship with life satisfaction. Meanwhile, the Esterlin paradox is not proven for Singapore and the Philippines.

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