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# The Urgency of Carbon Accounting Based on Willingness to Pay Carbon Tax

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**ABSTRACT**

The research aims to understand human behavior that plays an important role in reducing CO2 emissions through the concept of WTP which is based on psychological factors, that cover self-esteem, mortality salience, and health consciousness along with demographic factors including income level, knowledge, education, and gender. This study used a survey method, where data was collected through questionnaires that were distributed online to respondents with ages over 17 years. This study collected 150 respondents and data were analyzed using PLS-SEM. The results of the study show that the urgency to legitimize carbon taxes is seen as important by respondents. The average additional burden that respondents are willing to pay is Rp.25.000,- per month. Besides that, all psychological and demographic factors are proven can influence respondents' willingness to pay carbon taxes except for the relationship between income-WTP and self-esteem-health consciousness-WTP. The results of this analysis provide insight into the strong will of individuals that can encourage individuals to pay for losses due to carbon emissions based on TMT which will help the regulator to legitimize the implementation of carbon accounting followed by formulating the carbon tax regulations comprehensively as part of global climate governance. Moreover, regulators can focus on the principles of improving the quality of human life rather than just technical issues. This research helps to understand the WTP taxes associated with a psychological perspective within the TMT framework.

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## 1. INTRODUCTION

Recently, the demand to issue tax regulations for carbon emissions generated from many sectors has been increasing. To answer this demand, the government issued The Law on Harmonization of Tax Regulations Number 7 in 2021, even though the implementation is still limited only to steam power plants. OECD (2011) explains that there is a need to establish an environmental fee in the form of tax as a consequence of production activity that can harm the environment. Therefore, tax policy can be a tool to reduce negative externality (Beeks & Ziko, 2018). This policy is following the polluter-pay principle, in which only people who contribute to environmental damage must bear the cost of the negative externality (Soto-Oñate & Caballero, 2017). The polluter-pay principle can be a powerful tool to realize efficiency and justice to the environment in which polluters must pay the precautionary and control measure of the pollution that is managed by the government (European Union, 2021). This issue is also related to carbon accounting practices.

**Carbon accounting** is a system that gathers, records, and examines climate change-related data and then calculates and reports the findings to internal managers and external stakeholders using accounting methods (Tang, 2017). In the future, the importance of carbon accounting will be as important as financial accounting, because the stakeholders and government will care more about the environment. This condition will influence the company's action both to comply with regulations and satisfy the demand of shareholders (Kusumawati et al., 2020). Research by McLaughlin et al. (2019) which surveyed accountants, found that most of their respondents agree that carbon tax gives a positive impact to the environment, but the negative impact is that the end customer will bear more expensive products. Besides companies, individuals are also actors who produce carbon emissions from vehicles, etc so they are also responsible to pay the carbon tax. In our research, we want to investigate whether customers want to pay carbon tax and how much they are willing to pay (WTP).

Furthermore, excessive carbon emissions can cause climate change which harms health (Silva et al., 2017). Information about climate change risks that can lead to death can generate mortality salience (Wolfe & Tubi, 2019). This study is based on **Terror Management Theory (TMT)** which is found by Greenberg et al. (1986). TMT states that people are aware that death is inevitable (Solomon et al., 2015). Therefore, it is important to make policies regarding carbon control by the government to protect people's welfare such as carbon tax. This study is also motivated by social physiological perspectives such as Dang et al. (2021). The previous study conducted by Barus & Wijaya (2022), Irama (2019), and Sutartib (2021) only explored the potential implementation of a carbon tax in Indonesia and didn't explore people's WTP. The concept of WTP in this study is directly related to the size or value of an individual's WTP to increase his satisfaction so that the value of an environmental condition can be translated into economic language.

We investigate how rational decisions are made with adverse effects that are harmful to health because of carbon emissions. Will CO2 emissions cause deep anxiety about death? At the same time, does self-esteem encourage people to actively defend their lives? We also investigate if mortality salience and self-esteem are the antecedents of health consciousness and WTP for a carbon tax. In addition, we explore the relationship between demographic factors and WTP for a carbon tax. This study is an initial contribution for regulators and experts to see the urgency of carbon accounting and as input to understanding individual responses to tax reform which is set by the regulator through the expansion of carbon tax objects so carbon tax is not only billed to companies but also to individuals who have daily activities that contribute to carbon emission.

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## 2. METHODS

Data was collected using a survey method. Samples are taken using a purposive sampling method by distributing questionnaires with age criteria over 17 years old and residents in Indonesia. The questionnaires are distributed through social platforms such as Line, WhatsApp, Telegram, and Instagram. In this study, we collected 204 respondents, with valid data of 150 respondents.

The design of our questionnaires is inspired by Goh & Matthew (2021), Dang et al. (2021), and Kotchen et al. (2017). The questionnaire has four main sections. The first section is used to collect demographic data. The demographic factors that were used in this study are gender (GEN), income (ICM), and education (EDU). Gender is measured using a nominal scale by giving code 1 for males and code 2 for females. Income level is measured using an ordinal scale, where income with range ≤ Rp.1.000.000,- will be coded 1, Rp.1.000.001 - Rp.3.000.000,- will be coded 2, Rp.3.000.001 - Rp.5.000.000,- will be coded 3, Rp.5.000.001 - Rp.10.000.000,- will be coded 4, and >Rp.10.000.000,- will be coded 5. Education levels are divided into 5 groups: elementary school (1), junior high school (2), senior high school (3), diploma (4), bachelor (5), master (6), and doctor (7).

The second section was used to measure respondents' knowledge about global warming (KNOW). Respondents will be given 5 questions with 3 answer choices (yes, no, don't know). Every correct answer will be given 2 points, and a false answer will be given 1 point, whereas if the respondent doesn't know, it will be given 0 points. The maximum points are 10 points and the minimum is 0 points.

The third section contains 3 questions used to measure the WTP for carbon tax. In this section, we used the Contingent Valuation Method (CVM) and combined two types of questions, open-ended questions and double-bounded questions. In an open-ended question, we ask directly what amount of money the respondent wants to pay for carbon tax. Whereas, in double-bounded questions, we used a multilevel question model, wherein the first level question is provided with a nominal amount of money and the respondent will answer yes or no. If in the first level, the respondent answers "yes", the nominal of money will be doubled up, and if the respondent answers "no" the nominal of money will be doubled down. The nominal on the first level is Rp.476.500,- (approximately Rp.40.000,- per month) and Rp. Rp.953.000,- per year (approximately Rp.80.000,- per month) or Rp.238.000,- per year (approximately Rp.20.000,- per month) depending on the answers of respondents at the first level. Every "yes" will be given 1 point, and "no" will be given 0 points. The valuation schemes can be seen in Table 1.

The fourth section contains mortality salience (MORTAL), health consciousness (HEALTH), and self-esteem (SELF). This three-factor is measured using a 5-level Likert scale from 1 to 5 in order from strongly disagree, disagree, neutral, agree, and strongly agree. Mortality salience and health consciousness each have 5 indicators, whereas self-esteem has 6 question indicators. Specifically, the self-esteem variable is divided into two main parts, 3 questions for positive self-esteem and 3 questions for negative self-esteem. For negative self-esteem, measurement is done by reversing the Likert scale value so the assessment method will be in line with the positive self-esteem question.

Data is processed using Warp PLS ver. 8.0, using Partial Least Square (PLS)-SEM analysis. The advantage of using PLS-SEM analysis is that the data do not need to be normally distributed and can be used even with small sample sizes.

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Table 1. Valuation Schemes to Measure Willingness to Pay Carbon Tax.

| | Scheme 1 (Q1=Yes, Q2 = No) | Scheme 2 (Q1=Yes, Q2 =Yes) | Scheme 3 (Q1 = No, Q3 = No) | Scheme 4 (Q1 = No, Q3 = Yes) |
|---|---|---|---|---|
| **(Q1) Rp.476.500,- per year or approximately Rp.40.000,- per month** | 1 | 1 | 0 | 0 |
| **(Q2) Rp. 953.000,- per year or approximately Rp.80.000,- per month** | 0 | 1 | 0** | 0** |
| **(Q3) Rp. 238.000,- per year or approximately Rp.20.000,- per month** | 1* | 1* | 0 | 1 |

* Notes: In schemes 1 and 2, if respondents answer "Yes" in Q1, then they will be given 1 score and in Q3 will automatically be given 1 score. This is because if respondents want to pay a higher amount, then automatically they will be willing to pay for the lower amount.
** Notes: In schemes 3 and 4, if respondents answer "No" in Q1, then they will be given 0 scores for Q1 and Q2. This is because if respondents aren't willing to pay Rp.40.000,- then automatically they will not be willing to pay for the higher amount in Q2.

## 3. RESULTS AND DISCUSSION

In this part, we present the key findings of this research, validity and reliability have met the specified conditions. In general, the results met our expectations except for ICM-WTP and the relationship between SELF-HEALTH-WTP. Detailed results are presented in **Table 2**.

Table 2. Respondent Demographics

| Gender | Frequency | % |
|---|---|---|
| Male | 61 | 40,67% |
| Female | 89 | 59,33% |
| **Total** | 150 | 100,00% |

| Education | Frequency | % |
|---|---|---|
| Elementary School | 0 | 0,00% |
| Junior High School | 0 | 0,00% |
| Senior High School | 28 | 18,67% |
| Diploma | 7 | 4,67% |
| Bachelor | 112 | 74,67% |
| Master | 2 | 1,33% |
| Doctor | 1 | 0,67% |
| **Total** | 150 | 100,00% |

| Income | Frequency | % |
|---|---|---|
| ≤ Rp.1.000.000,- | 90 | 60,00% |
| Rp.1.000.001 - Rp.3.000.000,- | 33 | 22,00% |
| Rp.3.000.001 - Rp.5.000.000,- | 12 | 8,00% |
| Rp.5.000.001 - Rp.10.000.000,- | 11 | 7,33% |
| > Rp.10.000.000,- | 4 | 2,67% |
| **Total** | 150 | 100,00% |

Source: Primary Data Processed (2022)

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In this study, 59,3% of the respondents were women. In terms of education, 74,67% of 150 respondents have bachelor degrees, 18,67% are in senior high school, 4,67% have diploma degrees, only 1,33% have master degrees, and 0,67% have doctoral degrees. The average of respondent income in one month is ≤ Rp.1.000.000,- with percentage of 60%, then Rp.1.000.001 - Rp.3.000.000,- with percentage of 22%, Rp.3.000.001 - Rp.5.000.000,- with percentage of 8%, Rp.5.000.001 - Rp.10.000.000,- with percentage of 7,33%, and >Rp.10.000.000 have 2,67% percentage.

Knowledge about global warming is also one of the main indicators that have an influence on the WTP for a carbon tax. In this study, we used 5 questions to measure respondents' knowledge about global warming. The output indicates that most respondents have a good understanding of global warming can be seen in **Table 3**.

**Table 3**. Respondent's Knowledge About Global Warming

| Question | Frequency (Total = 150) | | | |
|---|---|---|---|---|
| | Yes | No | Don't Know | Answer Key |
| K1 | 143 | 4 | 3 | Yes |
| K2 | 145 | 2 | 3 | Yes |
| K3 | 26 | 109 | 15 | No |
| K4 | 131 | 5 | 14 | Yes |
| K5 | 130 | 6 | 14 | Yes |

Source: Primary Data Processed (2022)

In the third section, most of the respondents are willing to pay in the range of Rp.20.000,- to Rp.40.000,-. Based on Table 4, when the amount is increased to Rp.80.000,- the willingness dropped drastically to 35,3%. This may be possible because 60% of the respondents have an income level ≤ Rp.1.000.000,-. Whereas for the open-ended questions, the average carbon tax that respondents are willing to pay is Rp.299.654,- per year or approximately Rp.25.000,- per month. In research that has been done previously, the range of carbon taxes that people are willing to pay is CN201,86 or equivalent to Rp.399.774,- per year (Duan et al., 2014), US$3,66 or equivalent to Rp.48.964,- per year (B. A. Jones et al., 2017), CAD$84 - CAD$230 or equivalent to Rp.866.790 - 2.373.354,- per year (Benjamin et al., 2022), and US$177 or equivalent to Rp.2.367.908,- per year (Kotchen et al., 2017). The nominal difference in WTP can be caused by differences in the variables used to measure WTP, differences in research methods, or due to differences in the characteristics of respondents.

In the fourth section of the questionnaires, the measure of psychological factors including self-esteem (SELF), health consciousness (HEALTH), and mortality salience (MORTAL) produces the following results. For the SELF variable, from a total score of 30, the average score earned is 20,31 or equal to 67,71% which indicates that the respondent's self-esteem is high. For the HEALTH variable, from the total score of 25, the average earned is 17,27 or equal to 69,1% which indicates that respondents also care about their health. Whereas in the MORTAL variable, from the total score of 25, the average earned is 11,67 or equal to 46,7%.

Table 4. Willingness to Pay Carbon Tax

| WTP | 40.000 per month | | 80.000 per month | | 20.000 per month | |
|---|---|---|---|---|---|---|
| | Yes | No | Yes | No | Yes | No |
| **Frequency** | 99 | 51 | 53 | 97 | 126 | 24 |
| **%** | 66% | 34% | 35,3% | 64,7% | 84% | 16% |

Source: Primary Data Processed (2022)

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The outer model analysis is used to measure the validity and reliability values of the measuring instrument (in this case a questionnaire) can be seen in Table 5. Validity is used to test whether the measuring instrument used in the study is right. A reliable questionnaire indicates that the results obtained from the questionnaire are reliable and will remain consistent when repeated (Ghozali & Latan, 2015).

**Table 5**. Outer Model Analysis

| Variable | Indicator | | Loading Factor | CR* | CA** | AVE*** |
|---|---|---|---|---|---|---|
| | Original | Final | | | | |
| **GEN** | 1 | 1 | 1,000 | 1,000 | 1,000 | 1,000 |
| **EDU** | 1 | 1 | 1,000 | 1,000 | 1,000 | 1,000 |
| **ICM** | 1 | 1 | 1,000 | 1,000 | 1,000 | 1,000 |
| **KNOW** | 5 | 2 | 0,886 | 0,879 | 0,726 | 0,785 |
| | | | 0,886 | | | |
| **SELF** | 6 | 3 | 0,869 | 0,895 | 0,824 | 0,740 |
| | | | 0,839 | | | |
| | | | 0,871 | | | |
| **MORTAL** | 5 | 4 | 0,821 | 0,880 | 0,817 | 0,646 |
| | | | 0,760 | | | |
| | | | 0,837 | | | |
| | | | 0,797 | | | |
| **HEALTH** | 5 | 5 | 0,739 | 0,889 | 0,843 | 0,616 |
| | | | 0,741 | | | |
| | | | 0,812 | | | |
| | | | 0,796 | | | |
| | | | 0,831 | | | |
| **WTP** | 3 | 3 | 0,893 | 0,853 | 0,740 | 0,661 |
| | | | 0,796 | | | |
| | | | 0,743 | | | |

* Composite Reliability

** Cronbach's Alpha

*** Average Variance Extracted

Source: Primary Data Processed (2022)

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The validity test is divided into two types, convergent validity and discriminant validity. Convergent validity is indicated by the value of Average Variance Extracted (AVE) and loading factor, while discriminant validity is indicated by the value of cross-loadings and the square root AVE. The expected AVE value is above 0,5 because the value indicates that the indicator can explain more than 50% of the variance in the construct. Meanwhile, the loading factor must be above 0,7 to meet the requirements of convergent validity (Ghozali & Latan, 2015). To test the discriminant validity, the value of loadings is expected to be higher than the value of the cross-loadings of each indicator. In addition, the value of the square root AVE of a latent variable must be higher than the value of other latent variables in the same column (Sholihin & Ratmono, 2013). Reliability testing is performed using Cronbach's Alpha and composite reliability. According to Ghozali & Latan (2015), the value of Cronbach Alpha and composite reliability must be 0,7 or above to meet the reliability requirements.

The outer model analysis results can be seen in **Table 5** and **Table 6**. In the validity testing stage, some of the indicators that we used did not meet the requirements because they had a low loading factor value, so we had to remove them from this study. The indicators that we exclude were K1, K2, K5, SELF1, SELF2, SELF3, and MORTAL5 so the final results of the indicators used can be seen in Table 5. Overall, the questionnaire that we used after removing several indicators met the requirements of the validity test (AVE >0,5 and loading factor >0,7) and reliability test (Cronbach's Alpha >0,7 and composite reliability >0,7).

**Table 6**. Square Root AVE

| | GEN | EDU | ICM | KNOW | SELF | MORTAL | HEALTH | WTP |
|---|---|---|---|---|---|---|---|---|
| **GEN** | (1,000) | 0,115 | -0,075 | 0,010 | 0,122 | -0,014 | 0,048 | -0,073 |
| **EDU** | 0,115 | (1,000) | 0,097 | 0,155 | -0,088 | -0,129 | -0,002 | 0,187 |
| **ICM** | -0,075 | 0,097 | (1,000) | -0,017 | 0,110 | 0,013 | -0,069 | -0,118 |
| **KNOW** | 0,010 | 0,155 | -0,017 | (0,886) | 0,036 | -0,034 | 0,090 | 0,166 |
| **SELF** | 0,122 | -0,088 | 0,110 | 0,036 | (0,860) | -0,287 | 0,106 | 0,089 |
| **MORTAL** | -0,014 | -0,129 | 0,013 | -0,034 | -0,287 | (0,804) | 0,263 | 0,037 |
| **HEALTH** | 0,048 | -0,002 | -0,069 | 0,090 | 0,106 | 0,263 | (0,785) | 0,277 |
| **WTP** | -0,073 | 0,187 | -0,118 | 0,166 | 0,089 | 0,037 | 0,277 | (0,813) |

Source: Primary Data Processed (2022)

The inner model analysis is determined by the values of R-squared, Q-squared, Model fit, and quality indices. The R-squared (R2) values indicate the magnitude of the dependent variable that can be explained by the independent variable. Based on the R2 criteria by Falk & Miller (1992), the results of the R2 WTP and R2 HEALTH have met the requirements because both of them have a value greater than 10%. Referring to Ghozali & Latan (2015), Q-squared (Q2) must be more than 0 which indicates that the model has predictive relevance. The results of Q2 show a value of 0,217 (WTP) and 0,119 (HEALTH) which is greater than 0, so it can be said that the independent variable can predict the dependent variable well. Furthermore, to

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measure the suitability of the model used in this study, the value of the Average path coefficient (APC), Average R-squared (ARS), and Average adjusted R-squared (AARS) must meet the condition where the P value must be <0,05 (Kock, 2022; Sholihin & Ratmono, 2013). Meanwhile, Average block VIF (AVIF), Average full collinearity VIF (AFVIF), Tenenhaus GoF (GoF), Simpson's paradox ratio (SPR), R-squared contribution ratio (RSCR), Statistical suppression ratio (SSR), and Nonlinear bivariate causality direction ratio (NLBCDR) follows the criteria based on **Solimun et al. (2017)**. The results and criteria for inner model analysis are presented in Table 7.

**Table 7**. Inner Model Analysis

| | Index | P-value | Criteria | Explanation |
|---|---|---|---|---|
| **$R^2$ WTP** | 0,21 | | | Acceptable |
| **$R^2$ HEALTH** | 0,11 | | ≥0,1 | Acceptable |
| **$Q^2$ WTP** | 0,217 | | | Acceptable |
| **$Q^2$ HEALTH** | 0,119 | | >0 | Acceptable |
| **APC** | 0,175 | 0,007 | P < 0,05 | Acceptable |
| **ARS** | 0,163 | 0,010 | P < 0,05 | Acceptable |
| **AARS** | 0,137 | 0,021 | P < 0,05 | Acceptable |
| **AVIF** | 1,056 | | Acceptable ≤ 5<br>Ideally ≤ 3,3 | Ideal |
| **AFVIF** | 1,157 | | Acceptable ≤ 5<br>Ideally ≤ 3,3 | Ideal |
| **GoF** | 0,362 | | Small ≥ 0,1<br>Medium ≥ 0,25<br>Large ≥ 0,36 | Large |
| **SPR** | 1,000 | | Acceptable ≥ 0,7<br>Ideally = 1 | Ideal |
| **RSCR** | 1,000 | | Acceptable ≥ 0,9<br>Ideally = 1 | Ideal |
| **SSR** | 0,778 | | Acceptable ≥ 0,7 | Acceptable |
| **NLBCDR** | 1,000 | | Acceptable ≥ 0,7 | Acceptable |

Source: Primary Data Processed (2022)

The results of direct effect testing of self-esteem on WTP in Table 8 show a significant positive effect (p-value=0,04; β=0,14). These results confirm that a person's positive view of himself was affecting the WTP for a carbon tax as a consequence of the Polluter Pays Principle. **Rajan et al. (2019)** also explain that the self-esteem associated with the concept of materialism and strong status can affect a person's desire to pay a premium price. A person's self-esteem is also able to encourage consumers to reject unattractive products. Positive perceptions of consumers can make consumers choose good products (**Grewal et al., 2019**).

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Self-esteem has a positive relationship with health consciousness (p-value=0,01; β=0,19). Self-esteem is a person's assessment of himself (Schmeichel et al., 2009). Intimidation to one's self-esteem can change one's behavior (Molchanova & Sokolova, 2019). This result explains that someone with high self-esteem considers health problems are part of everyday life. Individuals who have high levels of self-esteem will avoid situations that can cause health problems so they are more likely to live healthily (Dang et al., 2021; Hong, 2011) and vice versa (Bornioli et al., 2019; A. Jones et al., 2018; Winter et al., 2017). These conditions can be explained by research conducted by Haltinner & Sarathchandra (2018) which said that self-esteem can influence sense and behavior about health which will increase the desire to diminish greenhouse emissions to increase their welfare (Hong, 2011). These results are basically in accordance with Kaloeti & Ardhiani (2020) who state that people with high self-esteem will make an assessment based on whether they are satisfied or dissatisfied with their physical appearance. They will focus on maintaining their physical appearance and body weight to remain ideal.

The results of health consciousness on WTP showed significant positive results (p-value<0,01; β=0,23). This shows that someone has the desire to pay a carbon tax with the influence of health consciousness. Health consciousness is a degree of a person's concern for his health as indicated by carrying out health-related activities in daily activities (Becker et al., 1977; Fleșeriu et al., 2020; Jayanti & Burns, 1998). Xie & Zhao (2018) stated that innovations that can improve public health will gain support from the public by paying more to improve their health. So, it can be said that individuals who have a high level of health consciousness tend to have higher WTP (Dang et al., 2021). Previous research has also stated that individuals with advanced health consciousness will give a positive response to eco-friendly products (Le Quéré et al., 2020). Therefore, carbon tax will be seen as a product that can reduce carbon pollution which is good for health. These results are consistent with research by Ali & Ali (2020) which state that health awareness is the main psychological factor that can affect buyers' willingness to purchase.

However, the mediation test revealed that health consciousness is not adequate to mediate the relationship between self-esteem and WTP carbon taxes with a p-value of 0,229. This means that self-esteem only affects WTP directly. The results of this study want to explain that WTP for a carbon tax is influenced by a person's psychological factors, namely how that person views himself and psychographic aspects related to a person's lifestyle and behavior. Although health consciousness cannot strengthen the relationship between self-esteem and WTP, self-esteem is still proven to have a direct influence on WTP because global warming is one of the things that threaten a person's self-esteem according to the TMT. The factors that affect WTP are also relevant to the characteristics of the carbon tax as a Pigouvian Tax which functions as a correction tool for negative externalities arising from the consumption of goods that cause carbon dioxide.

Mortality salience is a condition where people subconsciously change their attitude and behavior caused by fear of death to defend their cultural worldview (Sætrevik & Sjåstad, 2022). When this happens, a carbon tax can be seen as an effort that can be done to mitigate climate change so that the risk of disease is lower and can reduce fear of death so that people will be more supportive of carbon tax programs (Dang et al., 2021). This is proven through the direct effect testing of mortality salience on WTP which shows a significant positive result that means someone who has a higher fear of death will have higher desires to pay for a carbon tax. In this case, the concept of WTP is defined as a measure of the value that individuals want to pay to achieve their welfare. Consistent with our findings, research by Fa & Kugihara (2020) proposed

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that mortality salience is successfully managed by promoting larger donations to environmental charities, they view this as a way to suppress death anxiety.

Mortality salience has a significant positive effect on health consciousness (p-value<0,01; β=0,32). From a TMT perspective, humans feel threatened by their death and try to protect themselves from it (Burke et al., 2010), TMT also explains that people's behavior can change if someone's mind is dominated by mortality salience (Pyszczynski et al., 2021). The terror management health model (TMHM) proposed by Goldenberg & Arndt (2008) states that the fear of death can increase motivation to live healthily. Studies on TMHM by Li et al. (2020) and Fairlamb et al. (2022) suggest that death exposure can affect an individual's health behaviors and thus promote a healthy lifestyle to maintain their health, in other words, they are aware of their health. In accordance with that, the results of this study prove that the fear of one's death does influence one's health awareness. The indirect effect test results show that indirectly, people who are afraid of death will be wary of their health so they have the desire to pay carbon taxes. On the one hand, the health consciousness model can affect a person's WTP with the factor of the respondent's death dread, but on the other side, the fear of death can be directly related to the respondent's WTP for a carbon tax.

**Table 8**. Paths Testing Results

| Paths | Coefficients (β) | P-Values |
|---|---|---|
| SELF → HEALTH | 0,185 | 0,010*** |
| MORTAL → HEALTH | 0,319 | <0,001*** |
| HEALTH → WTP | 0,230 | 0,002*** |
| MORTAL → HEALTH → WTP (indirect effect) | 0,073 | 0,100* |
| SELF → HEALTH → WTP (indirect effect) | 0,043 | 0,229 |
| ICM → WTP | -0,112 | 0,082* |
| KNOW → WTP | 0,156 | 0,025** |
| EDU → WTP | 0,193 | 0,007*** |
| GEN → WTP | -0,112 | 0,080* |
| MORTAL → WTP (direct effect) | 0,132 | 0,048** |
| SELF → WTP (direct effect) | 0,136 | 0,044** |

* Significance at the 10%
** Significance at the 5%
*** Significance at the 1%

Source: Primary Data Processed, 2022

In demographic sectors, research conducted by Goh & Matthew (2021) suggests that demographic factors such as education, income, gender, age, household size, and marital status have a relation with a WTP for a carbon tax at a significant level. In addition, factors such as people's beliefs about humans as the cause of climate change, political affiliation (Rotaris & Danielis, 2019), level of household energy expenditure, and allocation of carbon tax revenues (Kotchen et al., 2017; Maestre-Andrés et al., 2021) also affect the public WTP. But uniquely, a variable does not always have the same effect across countries in the world. One example is

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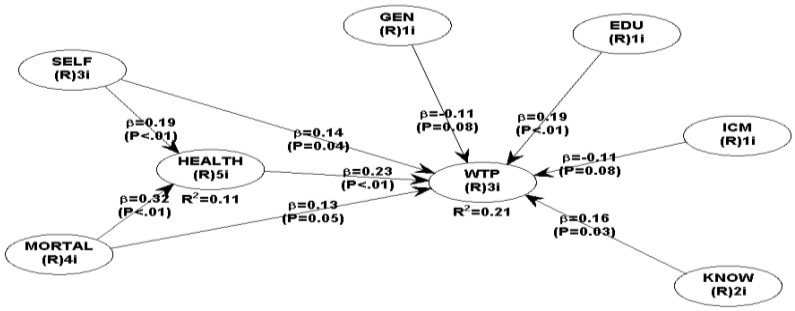
the income variable, in Australia which is a developed country, has a lower WTP than India, which is a developing country (Rotaris & Danielis, 2019). Because of these inconsistencies, we present our research results as follows.

Based on Figure 1, Income level has a negative relationship on WTP carbon tax (p-value=0,08; β=-0,11). This can happen when rich people do not take the harmful effects of environmental damage seriously because the comfort and security of their life will be guaranteed as long as they have this wealth. Meanwhile, the poor view the negative impact of environmental damage as something very harmful (Lo, 2016). Based on the perspective of "objective problems–subjective values" (OPSV) by Inglehart (1995), low-income countries have a higher level of environmental concern than high-income countries because low-income countries suffer from more serious problems due to environmental damage. Aside from that, an increase in a person's income is not always directly proportional to the level of willingness to pay for environmental protection because environmental pollution is more influencing than the level of the person's income (Shao et al., 2018). Our results contradict with research conducted by Ma et al. (2021) which found that income positively influences WTP carbon tax.




Source: Primary Data Processed (2022)

Figure 1. PLS-SEM Results

Higher level of education will increase the knowledge possessed by a person because at each level of education the values and knowledge gained will become more profound. Acquired values and insights enhance an individual's environmental awareness, including environmental awareness (Han et al., 2019). As a result, environmentally conscious people are more willing to pay to protect the environment (Kotchen et al., 2013; Park, 2018; Rotaris & Danielis, 2019). In line with that, the study shows that education level is one of the main factors influencing an individual's WTP, with a significance level of 1%. Similar research results were also obtained from research conducted in China which stated that the level of education not only improves one's status and economy but also increases one's self-awareness to protect the environment by supporting pro-environment policies (Tianyu & Meng, 2020).

Knowledge will affect the way a person acts (Ngah et al., 2019). The knowledge about the environment will produce environmental awareness, and environmental awareness will shape environmental behavior, which in this study is WTP for a carbon tax (Kusumawati et al., 2020). Environmental awareness will affect the way of thinking and decision-making of a person. This statement is proven by research conducted by Nelson et al. (2021) and Hojnik et al. (2021) which stated that knowledge about environmental issues is one of the main factors that influenced WTP. So when someone has a sufficient level of knowledge of topics related to carbon taxes or global warming, it will further increase their WTP for a carbon tax (Wei et al., 2018). The result of this study also concluded that knowledge has a significant effect on WTP for a carbon tax (p-value 0,03; β=0,16).

Gender had a significant effect on the WTP at the 10% level (p-value=0,08; β=0,23). We conclude that men tend to have a higher WTP than women. Duan et al. (2014), Huang & Ge (2019), and Kucher et al. (2019) stated that men prefer and choose environmentally friendly

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products more than women. Han et al. (2019) reveal that men have higher WTP for waste management because men feel more responsible for their environment. A similar study also suggests that men tend to be more willing to improve air quality by spending more money on it (Ouyang et al., 2019). Research conducted in Norway also states that men are more willing to pay higher toll road taxes in order to reduce air pollution (Grimsrud et al., 2020). So it can be concluded that men are more concerned and aware of the importance of protecting the environment than women so they have higher WTP for a carbon tax than women.

In the future, the results of the individual WTP and the factors that influence the WTP will also affect company behavior, this is because by knowing the nominal amount of money that individuals are willing to pay for carbon tax, companies can also adjust the burden for the carbon emissions they produce to end customers. So indirectly this will also affect both carbon accounting and management accounting. Management accounting's concept will help companies to deal with carbon emissions and climate change accounting problems, such as reporting procedures, performance evaluation, risk assessment, and target setting (He et al., 2022). Furthermore, although carbon intensity and environmental costs do not directly affect a company's financial performance in the short term, they can help companies establish good relationships with consumers (Nengzih, 2022).

## 4. CONCLUSION

Nowadays, human activity that contributes to environmental damage has been increasing, so there is a need for green accounting treatment and government policies. Indonesia's government has already issued The Law on Harmonization of Tax Regulations Number 7 in 2021 as a commitment to reduce air pollution that occurs in Indonesia. This study successfully proves self-esteem and mortality salience can directly influence WTP for a carbon tax which indicates that psychological factors play a role in determining the WTP for a carbon tax of the community. In addition, health consciousness successfully strengthens the relationship between mortality salience and WTP for a carbon tax. But unlike Dang et al. (2021), we found that health consciousness failed to moderate the relationship between self-esteem and WTP. In the demographic sectors, people with a high-income level, poor knowledge about global warming, low education, and women are more reluctant to pay a carbon tax. The average carbon tax that respondents are willing to pay is Rp.299.653,- per year or approximately Rp.25.000,- per month.

This study reinforces previous studies and literature which is useful for regulators and experts regarding the urgency of carbon accounting and to know individual WTP for carbon emissions offset and response to climate change which are associated with psychological and demography factors, especially in Indonesia. There are a few limitations that can be improved in the next study. First, it is expected that a larger sample will be used in future studies so that the population can be better represented. Second, because of the low r-squared value in this study, we hope the next study will explore other factors that can influence WTP for a carbon tax. Third, research about carbon accounting as well as carbon tax should be deepened because the urgency of carbon accounting is increasing.

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