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Language Preferences from Accounting and Linguistic Perspective in Sustainability Report

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Abstract.

This study aims to empirically analyze the tendencies of companies in Indonesia in reporting the number of carbon emissions as well as their economic, environmental, and social performance, before and after the ratification of Law Number 7 of 2021 concerning Harmonization of Tax Regulations by the Ministry of Finance of the Republic of Indonesia.

In analyzing the tendencies, this study uses a simulation through the *measured emission taxes* approach by using data on carbon emissions of issuers which are listed in IDX ESG Leaders on the Indonesia Stock Exchange from 2020 to 2021. It proceeds with the auditing process by applying Benford's law Principles, which have been proven to be a simple and effective audit tool in detecting the presence of irregularities in reporting an account value. In addition, the writers also investigate the difference in the number of linguistic hedging used in the 2020 and 2021 sustainability reports.

The results of this study indicate a tendency of unreasonable reporting in carbon tax values in 2021 (this is after the ratification of the Carbon Tax Law) when compared to reporting in 2020 (before the ratification). The writers found that hedging is used more frequently in the sustainability reports of 2021 in which the Carbon Tax Regulation is implemented. This research is the first research to examine the Sustainability Report in both numerical and verbal frameworks.

Keywords: Carbon Tax, Benford's Law Principles, Linguistic Hedging

1. Introduction

Law No. 7 of 2021 concerning the Harmonization of Tax Regulations has been implemented since October 2021 and will take effect in the 2022 fiscal year. One of the provisions is to regulate the implementation of carbon taxes and the determination of the stages of the carbon tax roadmap and the carbon market (https://peraturan.bpk.go.id). The idea of implementing a carbon tax originated from the Kyoto Protocol which was adopted on December 11, 1997. The Kyoto Protocol regulates the procedures for reducing Green House Gas (GHG) emissions that have been implemented by developed countries. However, due to the complex legalization process in several countries, the Kyoto Protocol was only enacted on February 16, 2005. To date, 192 parties have implemented the Kyoto Protocol. In summary, the Kyoto Protocol implements the United Nations Framework Convention on Climate Change (UNFCCC) where industrialized countries and economies in transition are required to limit and reduce GHG emissions following agreed individual targets. The convention itself only requires these countries to adopt policies and mitigation measures and report them regularly (https://unfccc.int/process/the-kyoto-protocol/status-of-ratification).

Since 2004, the Government of Indonesia has started implementing the Kyoto Protocol, which will voluntarily reduce carbon emissions. This is the Indonesian Government's first step in implementing the Sustainable Development Goals (SDGs). To fulfill this commitment, the Government of Indonesia needs additional instruments; both in terms of funding procurement and related to controlling the behaviour of market players, especially, GHG emitting industries (http://ditjenppi.menlhk.go.id).

One of the measures that can be used is through the implementation of a carbon tax policy. The concept of a carbon tax is a type of tax on pollution. This tax is imposed on the use of fossil fuels in dealing with market failures. This failure is related to the negative impacts that arise in the form of climate change and air pollution. Theoretically, increased costs due to the imposition of a carbon tax is expected to reduce the demand and use of fossil fuel activities. On the other hand, the absence of a carbon tax can increase excessive fuel consumption (Prianto Budi Saptono, 2022).

The focus of this study is not only aimed at obtaining the potential value of the carbon tax that could be obtained by the state; but also to audit the potential value to obtain the most reasonable value of carbon tax revenue. Analytical procedures that can be used in the auditing process are Benford's Law Principles (Newcomb 1881; Benford 1938). The basic concept behind this law is to assess the number of deviations that occur in a nominal data series by assessing the level of distribution of digits in the data, in which the spread of values is expected according to Benford's Law. On the other hand, if the distribution is not in line with the

application of Benford's Law Principles, then it can indicate a high possibility of the role of human interaction in the preparation of the report. In other words, the reported figures are non-natural because they contain elements of human manipulation (Nigrini 1996).

To date, the application of Benford's Law in accounting data has been recommended by several parties, especially for the detection of financial data in general ledger reports (Drake and Nigrini 2000; Durtschi et al. 2004) and is also used by auditors (taxation) in Indonesia in detecting financial data fraud (Prasetyo and Sinaga 2014). The development of the application of Benford's Law in financial data reporting is known to be quite rapid, and more parties are implementing it (Quick and Wolz 2003; Watrin et al. 2008; Nigrini 2011; Nigrini 2012). The latest research developed by Grammatikos and Papanikolaou (2020) shows the prowess of Benford's Law as it is capable of detecting the manipulation of income and the value of losses on bad loans experienced by several banking industries in America during the crisis in 2007 - 2012. In addition, the latest research in forensic accounting conducted by Edin Glogić and Zoran Jasak (May, 2021), also provides similar opinion; Benford's Law has become a significant forensic tool for detecting anomalies from 33,563 transactions. This further strengthens the researcher's argument to apply Benford's Law, especially in assessing the fairness of carbon emission data (Sustainability Report) which is the basis for simulating the calculation of carbon tax values. Lastly, the writers also want to find out whether there is any difference on the number of linguistic hedging used in the 2020 and 2021 sustainability reports.

In relation to the implementation of the carbon tax, the problems that can be formulated in this study are as follows:

1. Is there a tendency in the increase of non-natural reporting of carbon tax values on companies in Indonesia after the Carbon Tax Regulation is implemented?
2. Is there any difference on the average number of hedging used in the 2020 and 2021 sustainability reports?

In other words, at a macro level, the purpose of this study is to ascertain the potential for carbon taxes that can be contributed by the Indonesian Directorate General of Taxes to the State Budget. To actualize this major purpose, this research divides it into two specific objectives, namely:

1. To observe the tendencies of the increase in non-natural reporting of carbon tax values on companies in Indonesia after the Carbon Tax was implemented; and
2. To monitor the use of Linguistic Hedging in sustainability reports in Indonesia in 2021 (after implementation) compared to 2020 (before implementation)

This study is expected to provide several benefits, both academically and related to public policy. Academically, this study will enrich the concept of interdisciplinary research, namely between Accounting and Linguistics in Indonesia, by introducing a blend of the application of Benford's Law and Linguistic Hedging techniques in the field of Taxation. As for public policy, the resulting auditing scheme can assist the monitoring mechanism for carbon tax revenues by way of pouring this design into the development of an integrated (multi-stakeholder) taxation system.

2. Methodology

This is an empirical study, with all sustainability reports of issuers listed in the IDX ESG Leaders index in the Indonesian Capital Market during 2020 to 2021 as its unit of analysis.

2.1. Benford's Law

Several years after the introduction of Benford's Law (Frank Benford, 1938), various forms of application of the application of this law continue to be developed, one of which is through the research of Mark J. Nigrini (1996, 2000, 2011, 2012). Under Benford's Law, compliance testing of data distribution is measured using only the first digit benchmark. Nigrini offers much more than that. In brief, it will be explained further through the following explanation:

i. First-Digit Test
ii. Second-Digit Test
iii. First-Two-Digit Test

Note that the first and second digit tests are tests with a higher quality test of naturalness and will be used to determine whether the data set under study follows the pattern of Benford's Law naturally or not. If the first and second digit tests show that the distribution of the data pattern is significantly different from Benford's Law, then the first two-digit test will be carried out to then be directed in selecting audit targets.

i. First-Digit Test

In first-digit test model, the frequency distribution of the first digit of an actual data set will be compared with the distribution developed by Benford. This stage is a test with a simple level and its nature is only to clearly identify the anomaly (that is, only by directing the observer in the direction of the proper distribution pattern). Therefore, tests at this level should not be used to select targets in sampling, because the targeted sample size will be too large.

ii. Second-Digit Test

The second-digit test is also a simple level test designed to test the degree of conformity or naturalness of the data distribution. Note that the proportion of the distribution of the second-

digit expected in Benford's Law has a smaller degree of slope than the proportion of the first digit (Kellerman, 2014). Since the results of this test will also provide a large number of samples, then just like the previous test (first-digit test) this test is not recommended to be used in determining the audit sample. However, it can only be used by auditors to quickly identify potential problems in a data set.

iii.First-Two-Digit test

The first-two-digit test combines the two previous tests and identifies obvious deviations that will be further required in the auditor's review. Therefore, this level of testing can be used to select audit samples more efficiently.

2.2. Data Analysis on Benford's Law Test

i. Z-Statistic

The first empirical test can be done using the Z-Statistic method. This is a two-way test, with a rate of = 10% and the calculation formula uses the following formula:

$$Z = \frac{|po - pe| - (1/2n)}{\sqrt{(pe * (1-pe)/n)}}$$

If the Z-Statistic value generated from the test reaches more than 1.645, then this is an empirical indication that shows a significant data deviation which necessitates further examination.

ii. Mean Absolute Deviation (MAD)

Broadly speaking, MAD is intended to calculate the average of the absolute value of the difference between the actual proportion and the proportion of Benford's Law. The absolute difference is then summed and divided by the number of samples. After that, the cut-off value is calculated as a threshold to determine its significance, in which according to Nigrini (2000) the recommended threshold is as follows:

1. MAD : 0.000 - 0.004 *"Close Conformity"*
2. MAD : 0.004 - 0.008 *"Acceptable Conformity"*
3. MAD : 0.008 - 0.012 *"Marginally Acceptable Conformity"*

4. MAD : > 0.012 *"Non-conformity"*

2.3. The Use of Linguistic Hedging

Hedging is a linguistic phenomenon that is used to more or less precisely describe the topic of an utterance (Novák, 2015, p. 147). Lakoff (1973) was the first to analyze the idea of hedging in linguistics in more detail. He observed that hedging generally has two effects on fuzziness: firstly, the widening effect which widens the fuzziness, or the narrowing effect which shrinks the fuzziness.

Hedging appears to have a negative perception among language users because it displays uncertainty, which is seen as a sign of unreliability. A number of research had been done to find out how hedges may indicate fraud and deception (Choi et al., 2012; Choudhury, 2014; Humpherys, 2009; Milenković, 2021; Ott, 2018). First, a study had shown that deceivers strategically use hedging devices for information management purposes and to avoid responsibility. Due to the necessity to conceal, deceive, or invent, they utilize hedging more frequently (Humpherys, 2009). Secondly, even though hedges occur less frequently in scientific (Choi et al., 2012) but it should be noted that weasel words that hedge cause ambiguity, and introduce conjecture and inference as reliance, resulting in a travesty of intellectual honesty. As a result, the idea of truthiness is undesirable due to the hedging and weasel words (Ott, 2018). Lastly, studies in forensic analysis showed that the usage of hedging reveals lack of certainty in the fact and events. The strategy is typically used to make less factual statements (Choudhury, 2014; Milenković, 2021).

Nevertheless, it should be highly noted that hedge serves different functions. The most obvious function of hedges is as softeners among others. Firstly, hedges soften claims (Hatch, 1992). For example, second or foreign language speakers very often sound too blunt or too direct in the ears of native speakers. It might not be because they are rude, but it is probably because they do not hedge. Thus, hedging is considered positive and essential as an act of politeness (Nugroho, 2002). Secondly, hedges also function to soften complaints, requests, and commands (Brown & Levinson, 1987) performatives (Fraser, 1975), and criticism (Drechsel, 1989).

The data in this research are taken from sustainably reports which are listed in *Pasar Modal Indonesia* (Indonesian Capital Market) from 2020 to 2021. Among the reports available in the list, the writers only analyzed those reports which are written in English. There were 10 sustainably reports used in this study. The writers used AntConc software version 4.1.0 to compile the data to be a corpus and count the usage of hedging based on the list of hedges in Humphrey's (2009). The list of hedges taken from the sustainability reports in 2020 and 2021

was analyzed by using SPSS (Statistical Package for Social Science). Our goal was to determine whether there was a significant difference in the use of hedges in sustainability reports in 2020 and 2021. In this research, we used paired sample t-test by SPSS 26.0 to analyse the data.

3. Results

3.1. There is a tendency of non-natural report of carbon tax values after the Implementation of Carbon Tax Law

The analysis will begin with the simplest test, in which the provision of a confidence level of 0.10, data with a Z-statistics value greater than 1.645 indicates a significant deviation from the distribution of Benford's Law in the first digit test. In table 1, it can be seen the results of the tests carried out on all the sustainability reports of issuers listed in the IDX ESG Leaders in 2020 (before the ratification of the Carbon Tax Law).

Table 1. Testing the Carbon Tax Value of Issuers registered with IDX ESG Leaders 2020 – First-Digit Test

1st Digit	Count from Data	%	Benford's Law	Difference	Chi-Square	Z Statistic
1	6	0.4	0.301029996	0.098970004	0.032538491	0.55418
2	4	0.2666667	0.176091259	0.090575408	0.046588936	0.58203
3	3	0.2	0.124938737	0.075061263	0.045095648	0.48877
4	0	0	0.096910013	-0.09691001	0.096910013	0.83232
5	0	0	0.079181246	-0.07918124	0.079181246	0.65760
6	1	0.0666667	0.06694679	-0.00028012	1.17211E-06	-0.51220
7	0	0	0.057991947	-0.05799194	0.057991947	0.40860
8	0	0	0.051152522	-0.05115252	0.051152522	0.31325
9	1	0.0666667	0.045757491	0.020909176	0.009554581	-0.23027
Total	**15**				**0.419014557**	
				MAD	**0.027934304**	

From the table above, it can be seen that there are no significant deviations from the carbon tax value in the sustainability reports in the IDX ESG Leaders issuers in 2020. This can be seen from the acquisition of Z-Statistic values which are not greater than 1.645 (Z Critical Values 1.645; Confidence Level 90%).

Since the results of the first-digit test did not give a significant deviation result, then data processing does not need to be continued to the next level (Second-Digit Test and First-Two-

Digit Test). As previously explained, these tests will only be needed to direct the focus of the (audit) investigation if there are deviations that are quite dominant in the first-digit test. Therefore, it can be concluded that in 2020, there was no reporting of carbon tax values that experienced significant deviations when compared to Benford's Law principle. In other words, the population distribution followed the pattern of Benford's Law, so the reported figures were natural and do not contain elements of manipulation. The study continued with a review of the 2021 sustainability report.

Table 2. Testing the Carbon Tax Value of Issuers registered with IDX ESG Leaders in 2021 – First-Digit Test

1st Digit	Count from Data	%	Benford's Law	Difference	Chi-Square	Z Statistic
1	3	0.21429	0.301029996	-0.08674428	0.024996082	0.4162511
2	0	0	0.176091259	-0.17609126	0.176091259	1.378959267
3	**6**	**0.42857**	**0.124938737**	**0.303632692**	**0.737904145**	**3.031787683**
4	0	0	0.096910013	-0.09691001	0.096910013	0.773989874
5	0	0	0.079181246	-0.07918125	0.079181246	0.602316894
6	0	0	0.06694679	-0.06694679	0.06694679	0.467576566
7	1	0.07143	0.057991947	0.013436624	0.00311324	-0.356633767
8	**3**	**0.21429**	**0.051152522**	**0.163133192**	**0.520256617**	**2.164044361**
9	1	0.07143	0.045757491	0.025671081	0.01440211	-0.179835679
Total	**14**				**1.719801502**	
				MAD	**0.122842964**	

Table 3. Testing the Carbon Tax Value of Issuers registered with IDX ESG Leaders in 2021 – Second-Digit Test

2nd Digit	Count from Data	%	Benford's Law	Difference	Chi-Square	Z Statistic
0	1	0.07143	0.11968	-0.04825143	0.019453546	0.144521186
1	2	0.14286	0.11389	0.028967143	0.007367595	-0.079468919
2	0	0	0.10882	-0.10882	0.10882	0.878371561
3	1	0.07143	0.10433	-0.03290143	0.010375769	-0.034429687
4	1	0.07143	0.10331	-0.03188143	0.009838597	-0.047118809

5	2	0.14286	0.09668	0.046177143	0.022055529	0.132472331
6	1	0.07143	0.09337	-0.02194143	0.005156113	-0.177120708
7	1	0.07143	0.09035	-0.01892143	0.003962595	-0.219173161
8	**4**	**0.28571**	**0.08757**	**0.198144286**	**0.448340276**	**2.150071038**
9	1	0.07143	0.085	-0.01357143	0.002166867	-0.297082908
Total	**14**				**0.637536887**	
				MAD	**0.045538349**	

Table 4. Testing the Carbon Tax Value of Issuers registered with IDX ESG Leaders in 2021 – First-Two-Digit Test

1st 2 Digits	Count from Data	%	Benford's Law	Difference	Chi-Square	Z Statistic
10	0	0	0.041392685	-0.04139269	0.041392685	0.106661525
11	0	0	0.037788561	-0.03778856	0.037788561	0.040701925
⋮	⋮	⋮	⋮	⋮	⋮	⋮
17	0	0	0.024823584	-0.02482358	0.024823584	-0.261906368
18	**2**	**0,14286**	**0.023481096**	**0.119376047**	**0.606898447**	**2.067242919**
19	0	0	0.022276395	-0.02227639	0.022276395	-0.340694113
⋮	⋮	⋮	⋮	⋮	⋮	⋮
30	1	0,07143	0.014240439	0.057188132	0.229661631	0.678151419
31	**2**	**0,14286**	**0.013788284**	**0.129068858**	**1.208182948**	**2.995431667**
32	0	0	0.013363962	-0.01336396	0.013363962	-0.728285642
⋮	⋮	⋮	⋮	⋮	⋮	⋮
87	1	0,07143	0.00496342	0.066465152	0.890034862	1.637236262
88	**1**	**0,07143**	**0.004907334**	**0.066521237**	**0.901726786**	**1.649522126**
89	0	0	0.004852503	-0.0048525	0.004852503	-1.661722137
⋮	⋮	⋮	⋮	⋮	⋮	⋮
94	0	0	0.004595752	-0.00459575	0.004595752	-1.721492459
95	**1**	**0,07143**	**0.004547628**	**0.066880944**	**0.983603072**	**1,733211475**
96	0	0	0.004500501	-0.0045005	0.004500501	-1.744855554
97	0	0	0.004454341	-0.00445434	0.004454341	-1.756426071
98	0	0	0.004409119	-0.00440912	0.004409119	-1.767924358

99	0	0	0.004364805	-0.00436481	0.004364805	-1.779351712
Total	**14**				**8.280255803**	
				MAD	**0.591446843**	

As illustrated in the tables above, from the first-digit, second-digit, and the first-two-digit test, there is consistency in the findings, in which for the first-digit, a significant deviation was found in numbers 3 and 8 with a Z statistic of 3.031787683. and 2.164044361 (greater than 1.645). It is continued with the second digit test, to delve deeper into the findings from the previous test. From the second-sigit test, it was found that item number 8 also experienced significant deviations (2.150071038 > 1.645). Furthermore, when conducting the first-two-digit test, the results was consistent; significant deviations were still found at number 8 with a Z statistic of 1.649522126 > 1.645. Therefore, it can be concluded that, for 2021, there are reports of carbon emission data that experience significant deviations when compared to Benford's Law. These deviations are mainly found in the reporting of emission data which results in a carbon tax value with the first-digit, second-digit and first-two-digits in number 8 (eight).

3.2.The average number of hedging used in the 2020 and 2021 sustainability reports

This section examined the usage of hedges in the sustainability reports from 2020 and 2021. It is shown in Table 5 below that hedging was used more frequently in the sustainability reports of 2021 in which the Carbon Tax Regulation is implemented.

Table 5. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	USAGE RATE OF HEDGING 2020	539.17	6	741.975	302.910
	USAGE RATE OF HEDGING 2021	611.67	6	726.730	296.686

In this study, 10 sustainability reports from 2020 and 2021 were reviewed based on table 5. The average level of hedging in 2020 is 539.17. Then, it is clear that the average score of hedging used in 2021 is increasing and is currently 611.67.

Table 6. Paired Samples T-Test

	Paired Differences				t	df	Sig. (2-tailed)
	Mean	Std. Devi	Std. Error Mean	95% Confidence Interval of the Difference			

			atio n		Lower	Upp er			
Pa ir 1	USAGE RATE OF HEDGING 2020 - USAGE RATE OF HEDGING 2021	- 72.5 00	81.8 33	33.40 8	- 158.379	13.3 79	- 2.17 0	5	.082

Based on the table of Paired Sample t-test above, the significant value Sig. (2-tailed) < alpha (0.082 >0.05). Thus, it can be concluded that there is no significant difference in the increase of hedges used in sustainability reports in 2020 and 2021.

4. Conclusion/Implications/Recommendations

Researchers found a tendency in the form of the emergence of carbon tax values that tend to be non-natural in 2021 (after the implementation of the Carbon Tax Law) when compared to reporting in 2020 (before the implementation). Therefore, it can be concluded that there is concern from companies in reporting their levels of carbon emission after the government announced the implementation of the Harmonization of Tax Regulations on 21 October 2021. However, it should be noted that, to date, policy makers at the global level have not been able to frame a generally accepted method of carbon accounting analysis (Dias, 2011; Jonas, et. al., 2019). This can also be seen in the sample of this study, in which there are various standard references in calculating the carbon emissions produced, including the IPCC Guidelines for National Greenhouse Gas Inventories (2006), the World Resource Institute (WRI) GHG Protocol, and the World Business Council for Sustainable Development (WBCSD, 2004). Calculation of GHG emissions for business travel is carried out according to ICAO (International Civil Aviation Organization) standards, GHG Protocol tool for stationary combustion (Version 4.0.), Guidelines to Defra/DECC© GHG Conversion Factors for Company Reporting, Institute for Global Environmental Strategies List of Grid Emission Factors Standards (2019) and Electricity Specific Emission Factor for Grid Electricity Econometrica (2011). There is also the use of one application, namely https://tools.genless.govt.nz/businesses/wood-energy-calculators/co2-emission-calculator/. Therefore, to overcome the weaknesses of this study, it is recommended that, in future research, it is possible to increase the number of samples and ensure the application of uniform standards for calculating carbon emission data. This is very important, considering the value of the carbon emission data will be used as a basis for calculating the amount of carbon tax that will be charged to a company.

Secondly, it can be concluded that hedging was used more frequently in the sustainability reports of 2021 in which the Carbon Tax Regulation is implemented. Although much research

stated that hedges may indicate fraud and deception (Choi et al., 2012; Choudhury, 2014; Humpherys, 2009; Milenković, 2021; Ott, 2018), it should be noted that hedges also serve many functions (Brown & Levinson, 1987; Drechsel, 1989; Fraser, 1975; Hatch, 1992). Consequently, further research is needed to find out to what extent hedges are used in the sustainability reports.

In addition, even though Indonesia has an obligatory reporting requirement for environmental disclosure, the information that must be provided is still voluntary. It is still urgent to create regulations and standards that apply to all firms, even if *The Global Reporting Initiative*'s (GRI) sustainability report standards are now the ones that are most frequently implemented by companies in Indonesia (Budirahardjo, 2019; Rahayu, 2019; Syahputra et al., 2019). Due to the lack of standard reporting requirements for environmental disclosures, businesses are allowed to decide what information should be included in CSR annual reports or sustainability reports. As result, the lack of standards or guidelines along with the uncertainty to whom disclosure is intended makes the content of sustainability reports very varied (Rahayu, 2019). This study found out that the reports were written from 70 pages up to more than 250 pages. The inconsistency of the format and template might affect the usage of hedges in the sustainability reports. Lastly, the writers are also aware that the usage of hedging in writing is also influenced by culture (Nugroho, 2014). Therefore, to understand how culture influences the use of hedges in sustainability reports written by speakers of a second or foreign language, further research is highly needed.

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