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Business Strategy and Environmental Performance

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ABSTRACT

Business strategy choices are very influential in a company's environmental performance. Companies that choose the cost leadership strategy tend to streamline their expenses which leads to them overlooking the environmental cost. Meanwhile, differentiation strategy encourages companies to accommodate environmental costs to fulfill customers' demands. Therefore, this research aims to examine the impacts of the strategy choices on environmental performance, which has not been focused on by previous studies. This research's samples are public companies that are consistently participating in the PROPER program during the 2012-2017 period. There are 228 observations fulfill the sample criteria. The data are processed using the GRETL application that is fit for processing the panel data. We apply two proxies to measure each strategy choice. Cost leadership is proxied with the number of employees compared to the total asset of the company and net sales to the book value of plants, properties, and equipment. Differentiation is measured by sales, general and administrative costs to net sales and net sales to the cost of goods sold. This research's findings are, firstly, companies that choose the cost leadership strategy have lower environmental performances, and, secondly, companies with differentiation strategy have higher environmental performances.

Keywords: Cost Leadership; Differentiation; Environmental Responsibility; PROPER.

INTRODUCTION

Companies should have correct business strategies as a strategy to determine their place in the industry [42]. There are three basic business strategies: cost leadership, differentiation, and focusing. Cost leadership is a strategy chosen to win the competition by minimizing the cost to let them sell things with the lowest price; differentiation gives superiority from their competitors by offering various unique features on their products or services; and focusing concentrates on more specific market segment, whether it is differentiation or cost leadership [42]. This research focuses only on two strategies: cost leadership and differentiation, because those strategies are generally used by companies in a wider segment [5], [17].

Research on business strategies is often associated with companies' financial performance's success [1], [19], [26], [51]. On the other hand, companies' business strategies' success is not only determined by financial performance aspects but also non-financial ones, following the BSC theory [31]. Those non-financial aspects are customer satisfaction, internal business process, growth, and learning process. However, research on non-financial strategies is still rare [4], while environmental issues have become new supremacy in companies [46]. Thus, business strategies' success should not only be observed from financial aspects but also non-financial ones [41], [50].

Worries on environmental issues such as climate changes, greenhouse effect, and biodiversity degradation have come to the attention of many [55]. Thus, various companies have taken the initiative to be more environmental-friendly [36]. Companies' environmental performances in Indonesia are still low. According to Yale University's research, Indonesia ranked 133rd out of 180 countries with 46.92 EPI (Environmental Performance Index) (https://epi.envirocenter.yale.edu/epi-topline, 2018).

Business strategy is a factor to increase companies' environmental performance [22]. Choosing cost leadership and differentiation will give different results on environmental performance. To be more environmental-friendly, companies need additional costs. Companies that chose cost leadership that focuses on efficiency only charge functional costs, thus the environmental cost will become an additional burden for companies to be more competitive. Meanwhile, companies that chose differentiation will make environmental cost as unique attributes for customers because customers tend to be insensitive to cost [8], [40].

[12] and [26]'s research find that differentiation strategy gives a positive impact on environmental performance because companies will innovate their products to be environmental-friendly companies. Meanwhile, cost leadership strategy gives a negative impact on environmental performance [19] because environmental investment to change companies' business processes into a more environmental-friendly one will increase their expenses [12].

This research focuses on Indonesia because, firstly, the government's attention toward companies to be responsible for their environmental impact is high in Indonesia. The proof of this claim is the Ministry of Environment's introduction to *PROPER (Program Penilaian Kinerja Lingkungan Perusahaan/Company Environmental Performance Assessment Program)* in 2002, which aims to give ratings to companies' environmental performance. The second reason for the research focus is until this research is written, there is still no research in Indonesia that associates the choice of strategy with environmental performance. For example, [51] research on the relationship between business strategy's success and financial performance is in accordance with [48], [49] and [54].

This research will measure business strategies by using quantitative data, not perceptional data as it was done by [21]. Measuring with perceptional data has several weaknesses such as its subjective nature. Only little portions of the respondents give complete answers because they are more open to giving answers according to their perceptions in comparison to precise quantitative data [21], [25]. Meanwhile, research that used quantitative data tends to give objective, specific, clear, and detailed results, as well as bigger research's scope, and thus become their plus point [16], [25]. Because of that, this research will study the influence of choosing a business strategy towards environmental performance in Indonesia on the sectors of manufacture, mine, and farm by using quantitative data.

Business Strategy

[31] states that business strategy is one of the companies' strategies that is used to formulate, implement, and evaluate an organization's decisions to achieve its goals. This statement emphasizes that business strategy is a systematic way planned by the companies to reach their goals. [42] have developed tested and widely accepted business strategy typologies [33]. This research uses Porter's strategy typologies (1980) because most previous literature adopted and acknowledge it as competitive strategy literature [6], [17], [32]. Two main typologies of Porter's model are Cost Leadership and Differentiation.

[15] define Cost Leadership strategy as an effort to get the lowest cost in the industry by making use of economies of scale and scope as well as utilizing advanced technology. Cost Leadership strategy is capable of creating bigger profits for companies because it enables them to do strict cost control [57]. Strict cost control can be done through experience, strict control towards the current cost, avoiding end users' accounts, and minimizing discretionary costs like research and development, service, salesforce, advertising, and so on [43].

Differentiation strategy is the second form of Porter's business strategy (1985), where companies are offering different kinds of products and services from their competitors to create a unique industry. Differentiation strategy is liked by customers who prioritized uniqueness, product quality, and extra benefits [2], [43], [39]. This is done by offering quality, excellent customer service, and brand image [15].

Differentiation strategy is done by giving certain uniqueness and quality to get a competitive price [43]. Differentiation could be done by knowing the source of their competitive advantage, seeking companies' differentiators, choosing an effective market position maker, and communicating their position maker in the market. With these, the company would have an advantage in the competition through customers' loyalty to their brand image [43].

Balanced Scorecard

[31] Balance Scorecard (BSC) is a management system that communicates companies' strategies into financial and non-financial perspectives to integrate companies' activities and their strategy. BSC aims to interpret companies' vision, mission, and strategy in a set of performance measurements that are integrated and composed into four perspectives: financial, customer, internal business process, as well as education and growth. Balance Scorecard in a non-financial perspective is related to sustainability issues such as social and environmental [31]. Environmental issues can give symbiosis between economic goals of a company (financial) with non-financial (environmental), whereby associating with BSC could give companies' strategic pictures regarding environmental problems and how their decision could be in line with the companies' business strategy.

Thus, the four BSC perspectives (financial and non-financial) could be linked with environmental issues as indicators to evaluate companies' environmental performance [20]. For example, customer perspective, if the environment became a company's attribute, the customers will appreciate that

company's products more. Internal business perspective in its relation with the environment will measure the pollution produced by the company's business process. Meanwhile, the relation between the environment with educational perspective and companies' growth could perform product evaluation from the eco innovation process and train their staffs so that they could have more initiatives and be more aware of environmental problems. Next, still in the environmental context, the financial perspective should bring awareness on the impact of companies' environmental performance on their financial performance.

Environmental Responsibility

Environmental responsibility is a form of companies' voluntary concern to integrate environmental concerns in their business operation and the interaction with stakeholders (Wibisono, 2011). The increase of people's awareness of climate change and other environmental problems demanded companies to hold more responsibility toward the environment. Thus, management is demanded to pay attention to the environment and make serious efforts to resolve it [53]. One way to measure companies' environmental responsibilities is by looking at their valuation on companies' performance ranking *(PROPER).*

PROPER is an environmental performance ranking that was released annually by the Indonesian Ministry of Environment and Forestry for more than ten years. The objective of the ranking is to increase companies' performance in environmental preservation. *PROPER* valuation is categorized into five colors, with gold (5 scores) as the best rating, which means that the company has done more environmental management than required and has put efforts on sustainably developing the society; the following colors are green (4 scores), blue (3), red (2), and black (1) as the worst ranking.

In their annual report, the Ministry of Environment and Forestry explained that *PROPER* valuation is based on companies' performance in obeying the requirements set in the legislation about environmental regulation on water pollution, air pollution control, B3 waste management, EIA (Environmental Impact Assessment; or *AMDAL),* and ocean pollution control (http://menlh.go.id/).

Hypotheses Development

To be a company that creates good environmental performance (green), companies will spend more expenses to invest their products into more environmental-friendly [12]. In developing countries, customers are highly sensitive to the price. This makes it hard to create environmental-friendly companies because the customers do not care about their environment [8]. Previous research shows that cost leadership gives a negative influence on environmental performance [10], [19].

Because of that, companies that use a cost leadership strategy will bring negative influence toward environmental performance because those companies will receive pressure on their production cost to maintain their position in cost leadership. This has become an obstacle for companies that want to have better environmental performance than others.

H1: Cost Leadership strategy negative influenced environmental performance

Differentiation and cost leadership have different influences on environmental performance because companies that use differentiation have different kinds of products and services from their competitors and have specific target markets. Thus, the objective of Differentiation is not only revolved around financial sectors but also in non-financial sectors by developing environmentally friendly products. Because of that, companies that use a Differentiation strategy will increase environmental performance. This is in accordance with [26], as well as [12] research that also found positive results. Based on the explanation above, the proposed hypothesis of this research is:

H2: Differentiation strategy positive influenced environmental performance

Control Variables

Firm Size

Firm size is a scale that is used to decide the size of a company. Firm size could be seen from total assets owned; the bigger the total assets, the bigger the company [27]. Firm size can be an important factor in implementing strategies for companies to increase their performance, thus, bigger companies will be more selective in choosing their strategies [51]. A big company will receive bigger public supervision and pressure from stakeholders to be involved in environmental activities to increase environmental performance [9], [13], [47]. Firm size variable is calculated as the natural logarithm of the book value of total assets [24], [35], [44], [51].

Firm Age

Firm age is included as one of the factors that influenced companies' performance in revealing their social responsibilities [45]. Companies that have years of history tend to be less productive and

less active in environmental activities because companies that have more experience will see those as cost-inducing activities [18], Roberts (1992). Firm age in this research is calculated using the logarithm of the companies' total years since their registry in IDX [14].

Leverage

Leverage is a reflection of companies' financial risk that could show the image of their capital structure and know the risk of uncollectible debts. In business strategy, leverage is used as a creditor's control toward companies [30]. Because of that, companies with high leverage will have low environmental performance because they received a lot of pressure from their creditors, which resulted in their effort to reduce their expenses, especially environmental expenses [9]. Leverage is calculated with total debt scaled by total assets.

RESEARCH METHOD

Sample

This study utilizes all companies in the manufacturing, agriculture, and mining sectors that participate in the PROPER program for the period of 2012-2017 because during this period, especially in 2012, the level of environmental pollution in Indonesia was dangerous alarming, where 75.2% of rivers in Indonesia were heavily polluted (https://icel.or.id).

Table 1. Sample Selection

Sample Criteria	Number of Companies
The number of manufacturing, agriculture, and mining companies listed on the IDX	216
The number of companies that did not participate in the PROPER of 2012-2017	(175)
The number of companies with incomplete data	(3)
Number of samples selected	38
The total sample used (38 companies for 6 years)	228

Table 2. Samples based on the company sector

No	Sector	Total	Percentage
1	Manufacture	27	71.05%
2	Mining	8	21.05%
3	Agriculture	3	7.89%
	Total	38	100%

Data was obtained from Bloomberg, and the environmental performance was obtained from the website of the Indonesian Ministry of Environment.

Operationalization of Variables

The business strategy of a company is measured using several measurements. Differentiation strategy is measured using the following two ratios, first, the ratio of sales, general and administrative costs to net sales (SGA). This variable indicates the company's investment in the activities needed to differentiate its products or services from its competitors [7], [17], [37], [57]. Higher allocation for SGA also reflects companies' pursuit of differentiation strategies (Wiggins and Ruefli, 2002). Second, the ratio of net sales to the cost of goods sold (SCG). Companies that use differentiation strategies can create unique perceptions of products and services which are superior to their competitors, so they will set prices above the market [42]. Therefore, the higher margins of high SALES/COGS reflect the differentiation strategy [34], [38]. While, cost leadership is also measured by two proxies, the first is ratio of net sales to the book value of plants, properties, and equipment (SPPE). The net-book value of plant, property, and equipment is the total stock of plants and equipment after deducted by depreciation [28], [34], [38]. Second, the number of employees compared to the total asset of the company (EPAS), where the number of employees is considered as an alternative proxy (output) and the company size is considered as input in the production process [28], [34], [38].

Environmental Performance is measured using PROPER. PROPER is measured by rating which consists of gold (score 5) for companies that score excellent, green (score 4) for companies that score very good, blue (score 3) for companies that score good, red (score 2) for companies that score poorly, and black (score 1) for companies that score very bad.

In this study, we utilized several control variables such as firm size which was measured by the Logarithm of Total Assets [24], [35], [44], [51]. The company age was measured by the Logarithm of the Total Company Year since the company was listed on the IDX [14]. Leverage was measured using Tot Debt Ratio divided by Tot Equity.

The model of Analysis

To test the hypotheses that have been mentioned, the analysis model used is described in the equation model as follows:

$$PROPER_{(i,t)} = \alpha_0 + \beta_1 EPAS_{i,t-1} + \beta_2 SPPE_{i,t-1} + \beta_3 SCGS_{i,t-1} + \beta_4 SGAS_{i,t-1} + \beta_5 FAGE_{i,t-1} + \beta_6 FSIZE_{i,t-1} + \beta_7 LEV_{i,t-1} + \varepsilon \quad (1)$$

Where:
EPASi, t: Employee per total asset of company$_i$ at year$_{t-1}$
SPPEi, t: Sales per PPE of company$_i$ at year$_{t-1}$
SCGSi, t: Sales per COGS of company$_i$ at year$_{t-1}$
SGASi, t: SGA per Sales of company$_i$ at year$_{t-1}$
FAGEi t: Firm Age of company$_i$ at year$_{t-1}$
FSIZEi,t: Firm Size of company$_i$ at year$_{t-1}$
LEV$_i$,t: Leverage of company$_i$ at year$_{t-1}$

Data Analysis technique

The data is processed using GRETL software. This research is classified as panel data because it has more than one independent variable. The method used in this study is a quantitative analysis method by applying data that is processed in the form of numbers so that it is easier to understand and comprehend.

Choosing the Best Model

In choosing the best model, panel data select 3 types of models, which include: Ordinary Least Square (OLS), Fixed Effect (FE), Random Effect (RE). And the selection of the best model needs a Chow test and a Hausman test. First selection by using OLS or Fixed Effect. OLS is an econometric method where the independent variable is the explanatory variable and the dependent variable is the explained variable (Seddighi, 2000). In OLS there is one dependent variable and one or more independent variables. Fixed effect (FE) is a model that has different intercepts for each subject (cross-section), however, the slop of each subject does not change over time [23].

Random Effect is used to overcome the weaknesses of the fixed-effect model using dummy variables (Widaijono, 2009). Further testing is to choose between OLS and FE models using the chow test. The basis decision making of the p-value Chow test is <0.05, then H1 is accepted. H1 is the FE model which is the best choice of models. The second step that must be done is to determine between the estimated model of Fixed Effect or Random Effect. This is carried out by using the Hausman Test. The basis of decision making is the p-value of the Hausman Test is > 0.05 so H0 is accepted. H0 is RE which is the best choice.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 3 shows descriptive statistics and samples of company profiles based on the business strategy of the company. Overall, companies in Indonesia are concerned with the environment as indicated by the PROPER average of all companies with a blue rank of 3.126 (the companies have carried out environmental management properly).

Table 3. Descriptive Statistics

Variabel	Mean	Min	Max	S.D
PROPER	3,126	2,000	5,000	0,424
EPAS	3,775	4,208	2,759	5,509
SPPE	2,305	0,024	9,360	1,918
SCGS	1,332	0,899	2,077	0,260
SGAS	0,113	0,0007	0,405	0,072
FAGE	1,346	0,954	1,602	0,163
FSIZE	12,96	11,60	14,47	0,606
LEV	74,43	0,333	793,7	95,67

Table 4. Descriptive Statistics for PROPER

Variables	PROPER Rating			
	Rank 2	Rank 3	Rank 4	Rank 5
EPAS				
Mean	1,156	3,616	8,915	1,482
Min	4,208	5,480	1,869	6,546
Max	2,759	2,506	2,516	3,033
SPPE				
Mean	2,175	2,382	1,782	2,178
Min	0,078	0,024	0,405	0,939
Max	6,011	9,360	5,775	4,474
SCGS				
Mean	1,297	1,296	1,527	1,740
Min	1,002	0,899	1,306	1,331
Max	1,923	2,077	1,994	2,053
SGAS				
Mean	0,092	0,110	0,137	0,141
Min	0,017	0,0007	0,029	0,040
Max	0,302	0,405	0,263	0,281
FAGE				
Mean	1,482	1,332	1,359	1,395
Min	1,342	0,954	1,176	0,954
Max	1,602	1,602	1,544	1,544
FSIZE				
Mean	12,82	12,92	13,27	13,34
Min	11,83	11,60	12,38	13,08
Max	13,99	14,47	13,85	13,81
LEV				
Mean	56,79	79,63	56,96	27,12
Min	6,870	0,333	0,508	0,696
Max	147,6	793,7	217,1	81,65

Table 4 shows descriptive results from samples based on PROPER rank. Companies with cost leadership strategies that are measured using EPAS variables have the highest average scores which are ranked 4 with a value of 8.915. The SPPE variable has the highest average, which is ranked 3 with a value of 2.338. Furthermore, companies with differentiation strategies that are measured using SCGS variables have the highest average which is ranked 5 with a value of 1.740, whereas the SGAS variable has the highest average which is ranked 5

with a value of 0.141. These results show that companies with differentiation strategies are more concerned and environmentally responsible than companies with cost leadership strategies. FAGE variable with a maximum value of 1.544 and a minimum value of 0.954 indicates that the age of a company that is classified as new tends to have an excellent environmental performance with a rank of 5 on PROPER. LEV variable with a maximum value of 81.65 and a minimum value of 0.696 indicates that the lower the LEV, the better the environmental performance of the company with a rank of 5. FSIZE variable with an average value of 13.34, a maximum value of 13.81, and a minimum value of 13.08 has a rank of 5 on PROPER.

Choosing the Best Model

The first step to do in selecting the best model is to choose between the estimated *Pooled Ordinary Least Square* or *Fixed Effect* model using the *Chow Test*. The *Chow Test* results show that the p-value is -2,855, showing that the model selected is the *Fixed Effect* because the p-value is less than 0.05 (5%). The second step that must be done is determining between the estimated model of *Fixed Effect* or *Random Effect*. This step was done using the *Hausman Test*. The results of the *Hausman Test* show that the p-value is 0.449 which means that the chosen model is random effects because the p-value is more than 0.05 (> 5%). Therefore, the hetero test as further testing is not needed.

Table 5. Diagnostic Panel

	P-value
Chow Test	-2,855
Hausman Test	0,449

Table 6 below summarizes the results of *Pooled Ordinary Least Squared (OLS), Fixed Effect,* and *Random Effect Models.*

Table 6. Summary of the result *OLS model, Fixed, Random Effect*

	Pooled Least Squared		Fixed Effect		Random Effect	
	Cof	t	Cof	t	Cof	z
Const	2,178	3,590***	5,128	1,452	2,1270	2,232**
EPAS	-2,146	-4,438***	-1,872	-0,955	-2,100	2,841***
SPPE	-0,029	-2,109**	0,006	0,2445	-0,013	-0,748
SGAS	0,665	-1,453	-0,558	-0,885	-0,593	-1,254
SCGS	0,744	5,597***	0,506	2,321**	0,668	4,508***
FAGE	-0,121	-0,765			-0,094	-0,372
FSIZE	0,028	0,627	-0,202	-0,742	0,032	0,460
LEV	-0,0003	-1,246	-0,0001	0,369	-7,561	0,252
Adj R2	0,258					
F	-2,555					
Chi2			35,748		5,776	
Pro Chi2					-6,444	

Notes: *** Significant level at 1%, ** Significant level at 5%, * Significant level at 10%

Hypothesis Testing

Based on the testing of the best model selection in table 7 above, this study used a random effect model.

Table 7. Result of the *Random Effect Model*

	Coefficient	*Z*	*p-value*
Const	2,127	2,232	0,0256**
EPAS	-2,100	-2,841	0,0045***
SPPE	0,013	-0,748	0,454
SGS	-0,593	-1,254	0,210
SCGS	0,668	4,508	6,55e-06 ***
FAGE	-0,094	-0,372	0,709
FSIZE	0,032	0,460	0,644
LEV	-7,561	-0,252	0,800
Chi2	5,776		
Prob Chi2	-6,444		

Source: GRETL Output Results

Table 7 indicates that the cost leadership strategy measured by EPAS variables proved to have a negative and significant effect on environmental performance with a value of -2,100 (p-value = 0,004). However, the cost leadership strategy measured by the SPPE variable is not proven and not significant for environmental performance with a value of 0.013 (p-value = 0.454). Moreover, the differentiation strategy measured by the SCGS variable has a positive and significant effect on environmental performance with a value of 0.668 (p-value = 6.555). However, the measurement of other differentiation strategies with the SGS variable is not proven and not significant for environmental performance with a value of -0.593 (p-value = 0.210). Subsequently, the FAGE control variable is not proven to influence environmental performance with a value of -0.094 (p-value = 0.709). The FZISE control variable is not proven to influence environmental performance with a value of 0.032 (p-value = 0.644). LEV control variables were not proven to influence environmental performance with a value of -7,561 (p-value = 0,800).

Discussion

Cost leadership Strategy and environmental performance

This result is in accordance with hypothesis 1 which states that cost leadership strategies have a negative influence on environmental performance. The results of this study also show that the right measurement for the cost leadership strategy is the EPAS variable. It is because the companies prioritize efficiency, control costs tightly, reduce innovation costs, and demand employees to be more

productive so that the companies' productivity increases. They focus on functional aspects only without paying attention to other aspects such as the environment, which declines the environmental performance. On the other hand, the SPPE measurement is not consistent with the research conducted by [16] because it uses SPPE to measure the effect of cost leadership on the company's financial performance. It is also because SPPE functions to make the usage of the company's fixed assets effective in improving the company's ROA so that it only affects the company's financial performance [11]. The results of this study are in line with the research conducted by [10] and [19] which stated that cost leadership strategies negatively affect environmental performance.

Differentiation strategies and environmental performance

Subsequently, these results also support Hypothesis 2 which states that differentiation strategies have a positive influence on environmental performance. The results of this study also show that the right measurement for the differentiation strategy is the SCGS variable. It is because the company will make a high-profit margin by having a high cost of goods sold since it always innovates and develops (Wibowo et al., 2017). The innovation made are making environmentally friendly products, allocating costs for activities that revolve around the environment to improve environmental performance. On the other hand, SGAS measurement is not consistent with the research conducted by [16] because that study was used to measure the influence of differentiation strategies on the company's financial performance. SGAS is used to measure the efficiency of the company's operations and to predict the company's performance in the future [3]. The results of this study are consistent with the research conducted by [12] and [26] which state that differentiation strategies have a positive effect on environmental performance. It follows the Balanced Scorecard theory which states that environmental issues have an impact on the goal of the company's economy (finance), thus influencing the selection of the company's business strategy.

CONCLUSIONS

From this study, it can be concluded that the selection of business strategies affects environmental performance. The results of the analysis show that the cost leadership strategy has a negative effect, and the differentiation strategy has a positive effect on the environment. This negative effect shows that companies with a cost leadership strategy have poor environmental performance because the focus is only on the financial aspects without paying attention to non-financial aspects, that is the environment. The differentiation strategies have a positive effect on environmental performance. This positive effect shows that companies with differentiation strategies care more about and improve environmental performance compared to the cost leadership strategy.

For the company, the selection of business strategy can affect environmental performance because environmental performance is one of the methods to increase competitive advantage and company image in the eyes of investors. For investors, the research results are expected to provide understanding for potential investors and investors, to be more selective in choosing companies to invest in. Because by having a good environmental performance, the company can be sustainable, and its financial performance can increase. For the government, research findings that support that the choice of strategy has an impact on environmental performance, especially for the differentiation strategy, gives the government to further promote the PROPER program. The government is obliged to consistently require companies to follow PROPER, because poor environmental performance has an impact on the survival of the company itself and the entire community.

This study has several limitations, because not all proxies used to measure strategy choice give the same results. This research is also only applied to companies that consistently follow PROPER and such a sample is not large. Future research can add proxies to measure strategy choice so that the results are more solid. Future research also needs to involve a neutral sample, as a comparison, companies that do not consistently follow PROPER or companies that comply with environmental responsibilities other than PROPER.

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