APPLICATION ALL DIGITS NUMBER BENFORD LAW IN GLOBAL FINANCIAL STATEMENT

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Abstract
This study focused on the exploration for detecting fraud in the financial statements using the appearance digit number found on the Benford's distribution law. *R*esearch uses all the analysis numbers being in Benford's law. After receiving the results of the analysis of all the digits, the author makes a distinction between implementation using the scale above and below 5%, the rate of occurrence of difference. With a difference in the range of above and below 5% of the Benford's law, early detection of the occurrence of fraud against the financial statements can be followed up with these results. From the research that has been done, it can be concluded that the financial statements of PT Medco Energi Tbk follow the characteristics of the number that appears on Benford law. This study concluded that the Benford's law could serve as an indicator tool in detecting the possibility of anomalous figures in the financial statements of case studies of PT Medco Energy Tbk for fiscal year 2000-2010.

Keywords: Benford's law, First digits, all digits, financial statement.

JEL Classification : F47, G17, K13

1.INTRODUCTION

In economic and social science research conducted by Schräpler and Wagner (2005) [1] and Schäfer et al. (2005) [2], using panel data analysis and published in the journal of sociology in the United States found that similarity coefficient appears using predictive analysis figures in the Benford's law. The average amount of each digit numbers that appear in the data analysis, is believed to follow the pattern number of percentage rate of appearance of the numbers contained of in the benford law.This indicates the growing number of studies as well as research that strengthens the model of Benford's law. In the last two decades, the Benford's Law is increasingly being used and applied to real data and in scientific research, which is considered as a method for the identification of possible fraud in a manner that occurs in the analysed data. It is considered that the author as a reference in the study adds to the literature andscience, especially in the use of computational science to detect the occurrence of a fraud described by using figures.

In Carslaw (1988)[3], Thomas (1989) [4], Niskanen and Keloharju (2000) [5], Van Caneghem (2002)[6] did a study on existing countries in Europe such as Finland, UK, New Zealand, and US. They used second digit analysis to see the occurrence of cheating on income items with case studies of companies in the country. In several studies conducted in the United States as Schatte (1988) [7], Mark Nigrini (1996a) [8] Ley, E (1996) [9], Tödter, KH (2007) [10] and Giles (2007) [11]. In one of the studies they do, using Benford's law index of the average standard rate in the Dow Jones industrial index. The data used in the range of 10-15 years, as the basis of analysis of the study. It was one of several studies conducted in Germany, the results of these studies to identify the use of the first digit of the closing share price, the study results are approaching the level of trust the numbers contained on Benford's Law '. They argued that the analysis of the black scholes model in use in assessing a stock's price, at believe approaching consistency against Benford law which is used as a tool of analysis in the distribution of numbers. This is almost the same as the results of the analysis of the use of Benford law in analyzing the psychological barriers as well as against a population census data analysis in did in the U.S, who can believe in is resolved with the application of Benford law.

By using the amount lag data sets 20.000 Frank Benford in (1938) [12] did his studies by merging almost in its entirety the kind of data that he had, in the same joint. Indeed, if we look at Benford law since it appears, there is no longer an argument or proposal of a theory relationship by modeling the figure, could explain that bnford this law is less precise or less in terms of other analysis. Description of studies Frank Benford analysis against the data in the analysis, although do it with river flow, as well as the number of numbers that were in magazines, empirically rules on wearing on Benford law is similar to that done by Simon Newcomb. If the pay practice between Newcomb and Benford no similarity of flow or specialization of the same work. Benford's law and yet in a power level of probability, on the occurrence of the number that occurs from the analysis of each series of the number that do. Once in 1961 an empirically have the same flow with Frank Benford i.e. Roger Pinkham, consider the scale invariant on the benford law follows the rules of the universe. So, you can make that Benford's law continues to follow a scale model and the number of times will once and experience the difference and also the independence of such amount that is present in an atom or in the object as well as if in the financial markets related to stock market data.

In a study done by Mark j. Nigrini in (1992) [13], try applying how Benford law, could make a tool of analysis, especially in the economic sphere. Like the example in the paragraph above, look how the existence of a very instructive distribution of digits that are so perfect from a model made by Benford. Like we're holding to any currency with benford's law models will be a metric system and will continue to fit together, even on other planets. In the writings of Roger Pinkham who have been previously described in, giving results for Benford law not only in the form of scale invariant, but also they also distributed scale for obtaining scale invariance in the category. This can be set as a gesture in the mathematical science of statistics and are not affected by changes in the scale up distribution of Benford law. With the economic analysis, model examination Nigrini set out to learn about data on the overall stock market, where most of the overall quantity occurring in economic activities, always based on the observation that nature is more natural, and surely surely follow Benford law analysis model. Some success Nigrini applied by using model analysis of Benford's law i.e. as detection over Gen. fraud in the

field of taxation, as well as one in the form of a digital analysis of the phrase. Digital analysis technique in which the phrase is used by prosecutors in the country US (Broklyn) to analyze the two events that have succeeded in doing by Nigrini in his research. Other events in the use of Benford's law IE over tax refund at the time of the reign of Bill Clinton, but the model analysis Benford but give a hint about the occurrence of fraud in the course of the study. So in conclusion, Nigrini argued that Benford's law application of its nature is not universal, it is in such a lottery prize that they funded, where advantages and opportunities in statistics could not be answered with certainty, can say bias in results in getting.

On the other hand when we will try to take some random numbers, which will be in use for a sample of a distribution which is random, then it will happen a process that makes the distribution among several digits are fused with the distribution on the Benford law. This opinion will be in feel can be received by common sense, with the sense that the existence of a process that occurs in this universe are all considered as parameters the measuring scale, which is a parameter of yesteryear will be distributed by itself following the Groove as well as model rules of Benford law. So, a mathematician from a leading University named Theodore Hill Georgia Institute of Technology in Atlanta, in 1996 has its own answers about how the random numbers distribution can deduce by Benford law, so he assumed that the law is the law of Benford distribution over the numbers. Distribution of different meanings with the meanings of validate, if validate is an advanced step that possibility must be done after the process of distribution of figures analyzed in random order (according to the author). However, in the results of an analysis of a simple study using a sample study of weather data, distribution of numbers in the show using Benfod law on process simulation in did very clearly, in other words the results of these studies were not suitable or appropriate, with no apparent reality makes the simulation results performed not achieve reality.

2.LITERATURE REVIEW

In Nigrini and Mittermaier (1997) [14], Hill, T. (1995) [15] and Boyle, J. (1994) [16] consider benford's law could not be applied to all lists of numbers. If the look for some cases such as the volume of stock trading, the number of stock transactions, population, etc., benford law deem temporarily valid. But what about the case study in lift by current writers, is also true. If the view again to some of the approaches that require theoretical step in applying the law, the legal Benford Benford can be viewed as a rule or norm that must be follow correctly, by seeing and heeding to the model anomaly numbers appear for each case in the study. However this still randominasi numbers, which could indicate that the digits that appear on the map will follow the model of the appearance of the numbers on the benford law, both for the first digit, second and so on.

in Carlslaw, C (1988) [3], Nigrini (1994) [17], Durtschi *et al*. (2004) [18], Diekmann, A. (2007) [19], and Watrin *et al*. (2008) [20], questioned about the figures contained in the accounting and finance, especially related to the results of the above multiplication and Division math operations, such as the existence of trans-action of a number of net income of companies that use the item and price, as well as quantiti existence of a term in financial statements for taxable income After the Division of revenue, earnings per share. Actually in practice in accounting and finance, benford's law has been much used and applied since the 1980s. However, if seen from the examples of samples that use average only revolves around

the search level of cheating in the ietm revenue and taxation issues in the item company. In one of the State's research New Zealand found that model analysis in support of legal theory that benford said that a manager at in the company, more inclined to incorporate the values of in a sense close to the psychological limitations. And he gives the suggestion that Benford's law should use to help decision-makers, in detecting the occurrence of fraud in the accounting and financial reporting of the company. All these arguments are supported by some previous studies and some studies experiment, which gives results that benford's law can indeed detect the levels of fraud in financial reporting. In the argument that other researchers mention that benford's law provides a summary of the opinions and arguments are a good fit and can describe how a report going on the glaring discrepancy in terms of data for example, or that is associated with a set of accounting data that is in a sense there is a fallacy.

Several other studies about benford's law at the combine with a test of Wilcoxon-Mann-Whitney test and Chi-square test in Eagly, A. H. and Crowley, M (1986) [21], Ones, D.S. Viswesvaran, C.,(1998) [22], Eckel and Grossman, (1998a & 1998b) [23] [24], Glover, S.H., Bumpus, M.A., Logan, J.E., Ciesla, J.R. (1997) [25]; Dollar, D and Fishman, R. Gatti, R. (2001) [26], they conduct research with experimental-based survey. From the research tells us that the greater representation of women in Parliament, it will be in the make sure that the lower the level of corruption in the country. But from research done that shows no significative difference between two types of samples in use i.e. men and women. The influence of gender on a very few find, either in the decision or in making economic policy. But there are significant differences in the samples for research for the third and fourth digit of the number, while for the first digit of the number, the sample average man following digits benford law.

In the definition of fraud can be interpreted in an act that is intentional, and the Act is not in accordance with the law and regulations or laws that apply, as well as having an impact financially benefit to one individual or group. The following study focus related cheating by Simmons, M. R. (1995) [27], Wells, J. T. (2002) [28], Collins, D. W. *et al*, (2005) [29], Wang, J. *et al*. (2006) [30], Albrecht, W. *et al*., (2008) [31], Abbasi, A. *et al*. (2012) [32]. The rigged process a wide variety of fraud, for example, the case of bribery, corruption, fraud cases in which workers do in the financial statements. Normally this type of scam that many do inside companies involve internal and external parties in General. Such a revamp of financial reporting and disclosure in a sense should not. In the international standards of audit mentioned that an auditor should be responsible in the event of a relating to fraud in financial statements. And Auditors also have a responsibility in assuring that the financial reports that have been in the audit, non-food material and of distortion, or something that caused the occurrence of the element of deliberate action for the error in the fraud. As another example, in the case of Enron Corporation (Texas, USA) and the WorldCom scandal.

3.RESERACH METHOD

3.1.Data and time of Research

Same with study conducted by the authors using financial statement data of PT Medco Energy Tbk listed on the Indonesia Stock Exchange started the year ended 2000-2010. The author conducting this analisys data in June-Sept 2016.

3.2.Analysis data technique

The author uses the same way with the data analysis techniques in the analysis of the case study number 3, but on the techniques of data analysis case study No. 4, by using the test level compliance analysis performed by Nigrini and Mittermaier (1997),Newcomb, S. (1881), Nigrini,M., (1994), Malcolm W. Browne. (1998)[14] [33] [34] [35], to test on the last digit. Then in the context of achieving a conformance testing, do the following steps to get results as they expect.

To test digit number one(T=1): Author must Compares $f_i$with$e_i$for the Firstdigitofnumbers, i.e.fori=i_1,i_1 =1;:::;9.

To test digit number Last(T= Last Digit): Author must Compares $f_i$with $e_i$forthe Lastdigitofnumbers, i.e.fori=i_i,i_i =0;1;:::;9.

4.RESULT AND DISCUSSION

A variety of tools to be able to know and detect a fraud in various system numbers, very few in discover. Especially with regard to financial and accounting or financial reporting. Benford's law makes it can be done, by using model analysis-digit number found on the benford law. In the results of this study the author applied the model to the application of law benford analysis in whole digits in PT Medco Energy Tbk. As for the results of the analysis using model numbers on the benford law, presented in table 1 and table 2 below.

Table 1: Result test all digit benford law PT Medco Eenergy Tbk for the year 2000-2004

Different					
Year 2004	Year 2003	Year 2002	Year 2001	Year 2000	Digit
0,1%	-1,4%	1,3%	1,2%	-2,0%	0
0,6%	0,2%	1,0%	1,0%	1,9%	1
0,2%	-3,5%	-1,5%	-2,0%	-3,7%	2
0,8%	-0,6%	-1,1%	-1,3%	2,7%	3
-2,8%	0,9%	1,0%	-0,7%	-0,9%	4
4,0%	0,4%	1,2%	2,2%	2,3%	5
-1,2%	-1,0%	-0,4%	0,3%	2,8%	6
1,6%	-0,8%	3,5%	1,9%	-1,8%	7
0,1%	2,0%	0,6%	1,5%	1,0%	8
-0,8%	0,2%	-0,6%	1,0%	2,7%	9
13,2%	**6,8%**	**15,6%**	**15,6%**	**15,6%**	

Sources : Proceed by author

From the results of the analysis using benford model for all digits, look for the level of average appearance number first digit until the ninth digit under the upper limit and lower limit of 5% that is specified by the author. From 2000 up to 2004, the rate of appearance of the figures in the financial statements of PT Medco Energy Tbk adjust existing digits models or contained on the benford law. Here we see for the year 2005-2010.

Table 2: Result test all digit benford law PT Medco Eenergy Tbk for year 2005-2010

Different						
Year 2010	Year 2009	Year 2008	Year 2007	Year 2006	Year 2005	Digit
0,3%	-1,3%	-0,2%	-2,5%	-1,2%	0,9%	0
-1,9%	1,2%	-1,7%	4,1%	3,6%	2,6%	1
-0,9%	0,0%	2,5%	-0,4%	-2,7%	-0,5%	2
0,6%	0,9%	0,7%	-1,6%	0,6%	1,9%	3
-1,8%	-1,6%	-2,7%	-1,4%	-2,6%	-3,8%	4
-0,3%	2,8%	1,8%	0,2%	5,2%	3,2%	5
3,1%	-0,4%	-0,1%	4,5%	-0,4%	0,2%	6
2,4%	-0,2%	0,3%	0,3%	-1,6%	2,6%	7
3,6%	1,0%	3,5%	3,5%	2,6%	-0,5%	8
-0,2%	2,7%	1,1%	-1,6%	1,5%	-0,2%	9
15,6%	**15,6%**	**15,6%**	**15,6%**	**15,6%**	**5,6%**	

Sources : Proceed by author

Same is the case with the fiscal year of 2000-2004, for fiscal year 2005-2010 also gives results not much different. Indeed, the figures appearing in the financial statements of the company, if we search for it will follow the rate of appearance of the numbers on the benford law. If the numbers that appear on a financial report has not followed the rate of occurrence of anomaly Friday numbers correspond to the benford law, then you can be sure the numbers contained in the financial statements, there is confusion or a numbers game. If there is such a thing then the financial reports on the followup again deeper.

5.CONCLUSION

On the research study has previously been given the results that the company doing the manipulation of figures in the financial statements can be considered as a decline in performance financially in the company by M.J.Nigriniand S.J.Miller, (2007), Nigrini, M.J. (2000), Nigrini, M.J. (2002) [36], [37], [38].In conducting an examination of the data of the financial statements of PT Medco Energy Tbk for fiscal year 200-2010 can be conclude that, the occurrence of wrong food and the level of fraud in the financial statements does not exist. This can be seen from the results of the analysis using the benford law, which benford numbers prediction under the scale upper limit and lower limit of 5%. According to the author, it is of course, a financial report, produced with the number potentially there is no engineering and manipulation. Some important point also needs to be in the know that, for were chronicled the data used in this study has been through the process of review and repeat repair effect of the emergence of figures in the financial statements.

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