INCREASED COUNTRY RISK HAD IMPACT ON REGULARITY IN FINANCIAL REPORTS OF COMPANIES – SERBIAN CASE

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Abstract
During the world economic crisis country risk of transition emerging countries has been increased as result of various factors (for example country risk of Serbia, had increased from 1.525% in 2006 to 7.49% in 2013). At the same time fiscal deficit has growing trend. Accordingly, the state has increased taxes in order to generate income. Companies are main tax payers. They have dilemma how to prepare and announce financial reports, because if they are responsible they will pay higher tax vs. they will be in position to restructure or cancel debt. Subject of the research is to determine are data in financial reports of Serbian companies is objective. The sample consists of 4,029 largest companies. Period of analysis is from 2009 to 2013. By analyzing operating profit and net cash flow from operating activities, it was concluded that the frequency of digits 1, 3 and 4 deviates from theory of distribution based on Benford's law and regular algorithm distribution. In order to confirm the accuracy of the results obtained, they were validated by applying Chi-square test and Kolmogorov-Smirnoff statistic.

Keywords: Income statement, Operating profit, net cash flow from operating activities, Benford's law, fraud.

JEL Classification: G-32, H-29, M41, D81, K-13

Introduction

Country risk is premium which one entity earns in other country as result of financial transaction. It is determined with economic, political, social and financial terms and conditions of host country (where transaction is executed. According to Jelenkovic and Barjaktarovic (2010) the three important components of country risk are: political (which type of messages is expressed to the foreign investors by the state of host country), banking (stability of financial market) and systematic (part of market risk under governance of the state) risk. Central and Eastern Europe (CEE) countries felt the first wave of economic crisis at the end of 2008. Furthermore, cross-border loans which were used in CEE were transmission mechanism for economic crisis. Generally, country risk of CEE countries has worsted trend, because industry activity doesn't generate enough cash for growth and development for those countries (Pitic et al, 2014). For example, country risk of Republic of Serbia has flow from 1.525% (2006), 3.290% (2009) to 7.45% (2013) (Ministry of

Finance, 2013; Bloomberg, 2010; Reuters, 2010). At the same time fiscal deficit has growing trend. Accordingly, the state has increased taxes in order to generate income. Companies are main tax payers. They have dilemma how to prepare and announce financial reports, because if they are responsible they will pay higher tax vs. they will be in position to restructure or cancel debt.

Subject of the research is to determine are data in financial reports (balance sheet and income statement) of Serbian companies is objective. By enacting of the relevant law in 2004, Serbia undertook the obligation to apply IAS. Consequently, the companies were required to prepare their financial statements in compliance with the provisions set out in these standards. The implementation of IAS did not cause any major issues even though the experts in the field publicly expressed their skepticism (distrust) towards their implementation on the grounds that the standards provide for the possibility of accounting judgement.

To the best of our knowledge, there have been no court litigations in Serbia from 2009 onwards in which accountants were charged for wrongful preparation of financial statements. The court cases usually dealt with criminal charges for abuse of office while the charges for correctness and quality of financial reporting were practically non-existent. The abuse of authorization by those responsible for the preparation of financial statements is present worldwide. The most prominent cases of abuse of accounting procedures, for the purpose of presenting results which do not conform to the actual state of affairs, are Enron and WorldCom which presented misleading financial statements both to their investors and their owners. This inevitably leads to the following question: if such manipulation of financial statements is present in the most developed world markets, what is going to happen to Serbia after it has adopted European regulations and practices in the manner described above.

For this reason, the subject matter of this research is the following hypothesis:

The financial statements in the Republic of Serbia are not a fair presentation and disclosure of commercial transactions completed in the course of the business year.

We shall attempt to confirm or refute this hypothesis by using auxiliary hypothesis.

Data presented in the financial statements follow, and are in line with, Benford's law.

In this paper we discuss the accuracy and truthfulness of presentation of accounting results in the operating profit item in the income statement and the net cash flow from operating activities item as an element of the cash flow statement. International academic public has been increasingly publishing papers on the subject of cash flow and the methodology of presentation of cash flow statement since the 70s of the last century. Bankruptcies of many companies across the world are the consequence of inadequate analysis of cash flow, illiquidity and insolvency. This paper is an attempt to test whether operating profit and net cash flow from operating activities presented in the financial statement comply with Benford's law.

Methodology

In this paper we used the probability of digits which are log normal distributed based on Benford's distribution. In order to test the reliability and quality of data obtained we applied a Z-test, Chi square test and SK statistic.

In determining the frequency of distribution of a digit one in any number we used the following logarithmic relationship.

$$F_a = \log_{10}\ 1 + \frac{1}{p}$$

(1)

Here, p is a nonzero leading decimal digit 1, 2, . . ., 9.
The second digit in the number is calculated by using the following formula:

$$F_b = \frac{log_{10}\ 1+\frac{pz+1}{pz}}{log_{10}\ \frac{p+1}{p}}$$

(2)

Here, z may be any of 0, 1, 2, … , 9.
Benford's Law for arbitrary digits
For a number beginning with decimal digits abc … opq (Raimi, 1976).

$$log_{10}\ 1+x\ \approx\ x-\frac{x^2}{2}+\frac{x^3}{3}-\frac{x^4}{4}+\cdots\ \ /\log(10) \qquad (3)$$

$$F_q = \frac{log_{10}\ \frac{abc\ldots opq+1}{abc\ldots opq}}{log_{10}\ \frac{abc\ldots op+1}{abc\ldots op}} = \frac{log_{10}\ 1+\frac{1}{abc\ldots opq}}{log_{10}\ 1+\frac{1}{abc\ldots op}} \approx \frac{abc\ldots op}{abc\ldots opq} \to 1/10,$$

(4)

Thus, after the first few leading digits, there is little difference in digit frequencies.
According to Durtschi et al (2004) computational note: use log1p(x) instead of log (1 + x).
Wallace (2002) suggests that if the mean of a particular set of numbers is larger than the median and the skewness value is positive, the data set likely follows a Benford's distribution. It follows that the larger the ratio of the mean divided by the median, the more closely the set will follow Benford's Law. If distributions are selected at random (in any „unbiased way") and random samples are taken from these distributions, then the significant digit frequencies of the combined sample will converge to Benford's distribution, even though the individual distributions selected may not closely follow the law (Hill, 1998).
Several tax authorities now use Benford's Law tests in their auditing software to find tax cheats (Nigrini, 1999).

Table 1: Expected Frequencies of Digits in Collected Numerical Data on Benford's Law

Digit	**1st**	**2nd**	**3rd**	**4th**	**5th or Greater**
					higher
0		11,97%	10,18%	10,02%	10,00%
1	30,10%	11,39%	10,14%	10,01%	10,00%
2	17,61%	10,88%	10,10%	10,01%	10,00%
3	12,49%	10,43%	10,06%	10,01%	10,00%
4	9,69%	10,03%	10,02%	10,00%	10,00%
5	7,92%	9,67%	9,98%	10,00%	10,00%
6	6,69%	9,34%	9,94%	9,99%	10,00%
7	5,80%	9,04%	9,90%	9,99%	10,00%
8	5,12%	8,76%	9,86%	9,99%	10,00%
9	4,58%	8,50%	9,83%	9,98%	10,00%

Source: Nigrini, M. and Mittermaier, L., 1997, *Journal of Practice and Theory*, p. 57.

Test statistics can be strongly influenced by sample size, with some statistics requiring near perfect adherence to the distribution as the sample becomes large (Nigrini, 2012). We use two statistics when measuring conformity to Benford's distribution, the Kolmogorov-Smirnoff (KS) statistic and the Mean Absolute Deviation (MAD) statistic.

Data and Analysis

The research was conducted on a sample of 4,029 companies classified as large and medium-sized companies in accordance with the Serbian Companies Law. A large company, according to this law, is a company which: a) has more than 250 employees; b) generates an operating profit of more than 35,153,220.39 euros; c) owns assets in excess of 17,576,606.04 euros. Medium-sized company is a company which: a) has between 50 and 250 employees; b) generates operating profit between 8,838,522.61 and 35,153,220.39 euros; c) own assets worth between 4,419,265.16 and 17,576,606.04 euros . This analysis is based on the financial statements obtained from SBRA for the period between 2009 and 2013 prepared by the abovementioned group of companies. However, the subject matter of our analysis was the following business years: 2009, 2011 and 2013 in order to prove the continuity of application of Benford's analysis. In order to manage these data more easily and efficiently, operating profit and net cash flow from operating activities were transferred to Excel document and organized into pivot tables. The reason behind such a large number of companies contained in the sample is our desire to show realistic picture of the quality and accuracy of key balance sheet items and because the application of Benford's law gains on quality and reliability if the sample is large and statistically significant.

Table 2.3 show that digits 1 to 9 and their frequency as the leading digit in numbers present in the sampled financial statements are in line with Benford's law, value of z-test and Mean Absolute Deviation and Kolmogorov-Smirnoff (KS) statistic.

Table2: Frequencies of First Digits in Collected Numerical Data

First (OP)	Count	Actual	Benf. Law	Z-stat	First (CFOPA)	Count	Actual	Benf. Law	Z-stat
1	3638	0,302	0,301	0,117	1	3827	0,317	0,301	3,727
2	2064	0,171	0,176	1,431	2	2055	0,170	0,176	1,741
3	1582	0,131	0,125	2,044	3	1426	0,118	0,125	2,301
4	1210	0,100	0,097	1,243	4	1102	0,091	0,097	2,117
5	962	0,080	0,079	0,211	5	908	0,075	0,079	1,635
6	778	0,064	0,067	1,063	6	802	0,066	0,067	0,245
7	688	0,057	0,058	0,432	7	725	0,060	0,058	0,917
8	585	0,048	0,051	1,305	8	655	0,054	0,051	1,497
9	557	0,046	0,046	0,194	9	587	0,049	0,046	1,454
	12064		MAD=	0,003		12087		MAD=	0,005

Source: Author's calculations

Benford's analysis compares the actual frequency of digits with theoretical probability. If there is statistically significant deviation, the conformity of empirical distribution is tested by MAD and KS statistic. According to Benford's distribution, the probability of digit 1 as the leading digit is 30.10%. Actual results have high probability of deviation from the expected value due to random variation. In order to determine whether the variation is

statistically significant or not i.e. in order to determine whether false data were presented in the operating profit and net cash flow from operating activities positions, we used a Z-test. Z-test value of 1.96 indicates that p value is 0.05 (95% probability) while Z-test value of 1.64 gives a p value of 0.10 (90% probability). In order to conclude that analyzed income statement's positions contain incorrect data, the percentage of actual digits must significantly differ from expected, with the deviation exceeding either upper or lower deviation bound. Two dilemmas arise from this situation. The first one is intuitive in nature and the other statistical. Intuitive dilemma indicates that the value of fraud is large on a gross scale. Statistical dilemma indicates that the account i.e. accounting item which is subjected to testing has a large number of transactions related to it and therefore even a small percentage of inconsistent numbers will be sufficient to show significant difference from expected numbers. This is precisely the reason why auditors, who use preinstalled programs which include analytical tests based on Benford's law, are encouraged to test the entire account and not just a sample (Nigrini, 1999). The more advance version of Z-test, which tests only one digit at a time, is called a Chi square test. It is used to determine the statistical significance of difference between observed and expected distribution or frequency of relevant events. This test is applied in order to provide an answer to the question whether the number of observed distributions differs from expected?

Results presented in (table 2) show that all first digits in numbers representing operating profit are in line with Benford's law. The only digit whose frequency is above expected is the digit 3. Its distribution in the sample is more often than is expected. Absolute difference in its distribution is 0.06% and it is statistically significant because it exceeds the upper deviation bound (by 0.005%). For this reason, we be believe that auditors in the companies which have operating profit item beginning with digit three should check the accuracy of their income statement. Using 0.10 confidence level, (table 2) reveals that the frequency of each digit from one to nine (except digit three) in operating profit item is statistically insignificantly different from expected frequency. Out of 4,029 companies, operating profit in the income statement of 3,638 companies begins with a digit 1 which is 30.16% of the total number of analyzed data. According to Benford's law, the expected frequency is 30.10% and therefore this deviation is statistically insignificant which we demonstrated by using Z-test i.e. upper and lower deviation bound. It is similar with the other digits as well and their probability of being the first digit.

When presenting the accounting item net cash flow from operating activities in the cash flow statement, it is evident that the frequency of the first digit significantly deviates from the Benford's distribution. It is particularly conspicuous occurrence with the digit one, three and four. They show greater statistically significant difference than digit three in relation to operating profit item. We point out that deviation of the digit one from expected distribution by 0.016 is the greater deviation in the sample and indicates that the companies use the digit one in disclosure of this accounting item more often than they should. The frequency of the digit one as the first digit could be justified by the very nature of this accounting item which is the fact that it is calculated as the difference between cash inflow and cash outflow, whereas there is no logical explanation for the frequency of distribution of the digits three and four. Manipulation of business results, particularly in the cash flow statements, may mislead the investors and minority shareholders about the company's capacity to generate profit and therefore I believe that the results of this research are valuable to investors who are thus urged not to accept the financial statements at their face value without closer examination.

Results shown in (table 2) demonstrate that there is a major suspicion present that the companies manipulate and incorrectly present the net cash flow from operating activities in

comparison to operating profit. This leads to a preliminary conclusion that a large number of companies in Serbia recognize their business results in the Income Statement in a true manner and that there is a reasonable and statistically confirmed suspicion that data recognized in the Cash Flow Statement are untrue.

Table 3: Frequencies of Second Digits in Collected Numerical Data

Second (OP)	Count	Benford	Z-stat	Second (CFOPA)	Count	Benford	Z-stat
0	1458	0,120	0,384	0	1463	0,120	0,446
1	1396	0,114	0,617	1	1397	0,114	0,570
2	1301	0,109	0,330	2	1366	0,109	1,466
3	1214	0,104	1,315	3	1286	0,104	0,728
4	1259	0,100	1,466	4	1249	0,100	1,092
5	1134	0,097	0,981	5	1161	0,097	0,218
6	1093	0,093	1,030	6	1109	0,093	0,596
7	1100	0,090	0,302	7	1054	0,090	1,192
8	1037	0,088	0,610	8	1041	0,088	0,546
9	1072	0,085	1,503	9	961	0,085	2,149
	12064				12087		

Source: Author's calculations

Based on the frequency of the second digit in the number (table 3) we may conclude that there is no deviation between the actual frequency and expected frequency of digits according to Benford's distribution regarding the operating profit item. The situation differs slightly when it comes to net cash flow from operating activities. Unlike the frequency of the first digit, the frequency of the second digit shows deviation in digit nine only. Its frequency is lower than expected. This is the result of rounding the numbers and therefore the frequency of the digit one is higher than expected, as shown in (table 2). The results obtained by testing the frequency of the second digits are more in line with Benford's distribution than the first digits. In order to express our doubt in the accuracy of the presented accounting items, it is necessary to test the frequency of the first two digits in the number.