Do Small Companies
Have Superior Financial Expertise
Or Are They Just Managing Earnings?

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ABSTRACT

This paper addresses the issue of the earnings distribution (explicitly net earnings, operating earnings and financing income) of Slovenian micro, small and medium-sized enterprises (now on SMEs). It builds on the work by Burgstahler and Dichev (1997) on the earnings manipulation to avoid losses. We take their cross-sectional distribution of earnings approach as a baseline of our analysis, and apply it in an economic and financial crisis situation within the 2008-2010 period across various company size groups in Slovenia, a setting with extremely limited access to finance. However, since Durtschi and Easton (2005) claim Burgstahler and Dichev's (1997) approach per se do not necessarily prove earnings management, we additionally perform a non-parametric Wilcoxon matched-pairs signed-ranks test (Wilcoxon, 1945) on sub-samples of micro, small, medium-sized and large companies, controlled for their capital structure (indebtedness). The results of our analysis show a) earnings shifts occur in financial crisis also, b) earnings shifts occur more often among micro and small companies than medium sized and large companies, and c) despite of limited access to finance, rising funding costs and decreasing investment returns, micro and small companies making operating loss are recognizing statistically significant higher financing income compared to profit making micro and small companies and loss making medium sized and large companies.

Keywords: Distribution of Earnings; SMEs; Financing Income; Financial Crisis; Slovenia

1.   INTRODUCTION

$\mathcal{T}$he question of earnings quality – not just in terms of measurement, but also in terms of their useful- and uselessness – has been at the forefront of academic interest for over 50 years. So far myriad proxies for earnings quality have been identified, including (but not limited to) measures based on earnings attributes, such as *persistence, smoothness* and *timeliness*. In this context, a stream of accounting literature is focused on earnings shifts motivated by *small earnings increases* and *small loss avoidance* (see e.g. Burgstahler & Dichev, 1997; Degeorge er al., 1999; Brown & Caylor, 2005; Burgstahler & Eames, 2006). Only few studies[1] consider earnings management in private companies, but are due to lack of data limited either on medium sized and large private companies only (e.g. Burgstahler et al., 2006; Coppens & Peek, 2005), on private companies whose financial statements are required by law to be audited (e.g. Van Tendeloo & Vanstraelen, 2008; Ball & Shivakumar, 2005) or earnings shifts are tested on whole population, not by companies' sizes (Garrod et al., 2007). Since micro and small companies are more often forced to adapt to external environment determinants (constraints), such as increasingly denied access to external financial resources in financial crisis, they are more motivated to earnings shifts not only for tax reasons (as documented by Garrod et el., 2008) but to appear financially sounder as they truly are, too.

Addressing the issue of small loss avoidance of Slovenian micro, small and medium-sized enterprises (now on SMEs) this paper builds on the work by Burgstahler and Dichev (1997) on earnings management to avoid small

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[1] For a detailed overview see Healy & Wahlen (1999), and Dechow et al. (2010).

losses. Taking their *cross-sectional distribution of earnings approach* as a baseline our analysis makes two important contributions.

  First, we apply their distribution of earnings approach in a new economic setting, namely the 2008-2010 economic and financial crisis.[2] As Ball et al. (2008) find bank financing has a positive influence on earnings timeliness and Slovenia is a country dominated by debt market[3], we believe precisely this environment in a crisis did not only affect firms' capital structure and cost of capital, but worsened quality of earnings, too. Whereas Durtschi and Easton (2005) argue shapes of frequency distributions "*cannot be used as ipso facto evidence of earnings management*" (p. 558), we additionally perform a non-parametric *Wilcoxon matched-pairs signed-ranks test* (Wilcoxon, 1945) on sub-samples of micro, small, medium-sized and large companies controlled for their capital structure in order to determine whether indebtedness impacts earnings shifts.

  Second, while most of studies exclude *micro, small and medium sized enterprises* (now on denoted as SMEs) from their analysis, our extension of Burgstahler and Dichev's (1997) approach tests precisely this enterprise population, since it represents a vast majority of the whole business population in almost any country (over 90 per cent in Slovenia), and we believe such an important segment of the population should not be discarded as irrelevant, which is a common practice in the accounting literature. In addition, there is many anecdotal evidence that SMEs are the prime victims of the so called *"credit crunch"*, especially in times of financial crisis (European Commission, 2009), which further raises the question how limited access to finance and increasing financing costs affected earnings shifts in this segment of companies.

2. BURGSTAHLER AND DICHEV'S DISTRIBUTION OF EARNINGS APPROACH

  Burgstahler and Dichev's (1997) distribution of earnings approach is based on Hayn (1995) findings that firms' ability to report losses is limited as their shareholders hold a liquidation option. In this regard Burgstahler and Dichev (1997) hypothesize (and find) that earnings (scaled by company's market value) are managed to avoid earnings decreases by testing the statistical significance of distribution of earnings' smoothness around zero.

  Although Burgstahler and Dichev's (1997) distribution of earnings approach is widely used as an evidence of earnings management due to its simplicity, this approach has proven to be very limited in providing solid evidence that *kinks in earnings distribution* represent true earnings manipulation (Dechow et al., 2010). In this regard Beaver et al. (2007) urge for caution "*in interpreting a discontinuity in the earnings distribution as evidence of earnings management*", since some of the discontinuity can be attributable to true events, such as differential tax treatment, special items or presence of financial assets (Dechow et al., 2003). To determine whether discontinuity in the earnings distribution can be accredited to those reasons (and not true earnings management) we additionally perform a non-parametric *Wilcoxon matched-pairs signed-ranks test* (Wilcoxon, 1945): by quartiles we test medians of companies' income before income taxes (to exclude different tax positions of companies) and operating income (to control for financial assets and financial liabilities, also) whether they are the same. We apply this test on companies' quartiles (from more to less indebted companies) across various company sizes, since – according to Garrod el el. (2008) and Sweeney (1994) – indebted firms tend to report higher earnings.

3. SLOVENIAN FINANCIAL SYSTEM AND ACCESS TO FINANCE

  Following the German-based financial system the banking sector in Slovenia is the main financial vehicle for all companies: according to the Bank of Slovenia (2011) the banking sector had a 99.1 per cent share in the Slovenian financial market at the end of 2010 and total bank loans to the Slovenian business sector amounted to 38.9 billion EUR or about 59.3 per cent of all bank loans to non-banking sector (Bank of Slovenia, 2010). Not surprisingly, the 2008 global financial crisis had a devastating impact on the Slovene banking and its lending to non-financial institutions, which manifested itself in a severe downturn of loans to the private sector[4]. According to the Bank of Slovenia (2011) main reasons for decline in corporate loans were "*high corporate indebtedness and the*

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[2] Burgstahler and Dichev 's (1997) research is based on the 1976-1994 US data.

[3] Slovenian banking sector had a 99.1 per cent share in the Slovenian financial market at the end of 2010 (Bank of Slovenia, 2011).

[4] See Bank of Slovenia (2011, Figure 16).

related low creditworthiness, the rising cost of loan collateral and the maintenance of high premiums over reference interest rates".

Given the dominance of the banking sector as the primary source of external funding and as a member of the Eurozone, which requires corporate financial statements according to IFRS or Slovenian accounting standards closely aligned with IFRS, Slovenia provides an ideal setting for the study of the impact of the 2008 financial and economic crisis on the earnings distribution. This especially applies since *access to finance* is the most problematic impediment to doing business in Slovenia according to various international studies (e.g. World Economic Forum, 2011; World Bank, 2011). Beck, Demirgüç-Kunt & Maksimovic's (2008)[5] even estimate the average Slovenian company's share of external financing is merely 38.55 per cent (compared to e.g. Estonia: 60.14 per cent; Italy: 77.71 per cent and Poland: 58.60 per cent). All these international benchmarks indicate a highly impaired access to financial resources in Slovenia, which could have profound implications for earnings quality of Slovenian companies.

4.   DATA AND METHODOLOGY

4.1   Data source and sample

Each Slovenian company, regardless of its size, has to file an annual financial statement to the Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES), in order to meet the legal requirement of a public presentation of their business performance, as well as for tax and statistical purposes. As the nature of non-profit organizations and financial companies significantly differs from the rest of the companies, we excluded them from our analysis. Our sample, obtained from the AJPES, therefore consist of all *non-financial*, *profit oriented* companies registered in Slovenia to conduct business between 2008 and 2010. Due to earnings scaling insolvent companies (companies with negative equity) were omitted from our analyses, too.

According to Table 1 almost all companies in Slovenia (99% per cent) are SMEs[6]. In the period 2008-2010 the total number of companies increased by 7.2 per cent, but only due to rapid establishment of new micro companies. On the other hand, and in the light of the current financial and economic crisis, the number of medium-sized and large companies decreased partly due to shrinking business volume (e.g. companies moved to lower size classes) or even bankruptcy (Mörec & Rašković, 2011).

Table 1: Population of Slovenian companies breakdown for the 2008-2010 periods

	2008	**2009**	**2010**
Total AJPES population*	51,997 (100 per cent)	53,897 (100 per cent)	55,734 (100 per cent)
Total micro companies**	40,764 (78.4 per cent)	41,501 (77.0 per cent)	42,710 (76.6 per cent)
Total small companies **	2,277 (4.4 per cent)	2,332 (4.3 per cent)	2,278 (4.1 per cent)
Total medium-sized companies **	731 (1.4 per cent)	746 (1.4 per cent)	736 (1.3 per cent)
Total large companies**	750 (1.5 per cent)	738 (1.4 per cent)	689 (1.2 per cent)

Source: AJPES (2011), and authors' own calculations. <u>*Notes:*</u> **Non-financial enterprises, excluding single proprietors. ** Companies with positive equity value.*

4.2   Descriptive statistics

Based on the breakdown of descriptive statistics across various company size groups in Table 2 the biggest decrease in EBIT (scaled by current period sales, since market value of SME companies is generally not available[7]) can be observed among *micro companies*. Similar observations can also be made for the decreases in net income across the four company size groups.

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[5] Data taken from the World Business Environment Survey (WBES); 80 per cent of respondent companies were SMEs. See Beck, Demirgüç-Kunt & Maksimovic (2008) for more details.

[6] Classification is made according to Slovenian Companies Act and is as follows: micro companies (employees<10; revenues < 2 mn EUR; assets< 2 mn EUR); small companies (employees < 50; revenues < 8.8 mn EUR; assets < 4.4 mn EUR); medium sized companies (employees < 250; revenues < 35 mn EUR; assets < 17.5 mn EUR); large companies (all other).

[7] Scaled values by beginning of the period assets are available upon request from the authors.

Descriptive statistics also indicate that between sample (company sizes) and within sample heterogeneity is an important underlying feature of the data: the highest standard deviations have the sub sample of micro companies, followed by sub sample of large companies. Since sub sample of micro companies includes barely established companies as well as fully active enterprises, high variability is expected and it further draws attention to careful statistical treatment of the sample.

Table 2: Descriptive statistics by size of the company for selected scaled values
of net earnings and operating earnings for the 2008-2010 periods

Micro companies						
Net earnings/sales						
Year	N	mean	median	sd	min	max
2008	35,426	0.525	0.023	115.997	-2568.968	20992.881
2009	35,855	-0.546	0.015	37.415	-5017.659	680.295
2010	36,950	-0.152	0.016	18.402	-799.580	1922.706
Operating earnings/Sales						
Year	N	mean	Median	sd	min	max
2008	35,426	-0.191	0.035	22.174	-1749.487	1788.657
2009	35,855	-0.620	0.023	33.874	-3870.600	132.646
2010	36,950	-0.395	0.023	9.863	-873.680	186.285
Small companies						
Net earnings/sales						
Year	N	mean	median	sd	min	max
2008	2,277	0.019	0.018	0.548	-14.587	11.656
2009	2,328	0.006	0.013	0.615	-24.345	12.443
2010	2,277	-0.263	0.013	10.821	-508.253	13.389
Operating earnings/Sales						
Year	N	mean	median	sd	min	max
2008	2,277	0.019	0.037	0.856	-21.199	13.131
2009	2,328	0.004	0.027	0.826	-27.656	6.671
2010	2,277	-0.026	0.027	2.241	-101.707	13.505
Medium sized companies						
Net earnings/sales						
Year	N	mean	median	sd	min	max
2008	731	0.024	0.018	0.170	-3.324	1.744
2009	746	0.002	0.011	0.233	-5.086	1.880
2010	736	0.125	0.010	3.365	-6.770	90.970
Operating earnings/Sales						
Year	N	mean	median	sd	min	max
2008	731	0.038	0.033	0.172	-3.454	1.500
2009	746	0.005	0.024	0.298	-6.081	0.893
2010	736	-0.080	0.023	2.679	-72.303	2.491
Large companies						
Net earnings/sales						
Year	N	mean	median	sd	min	max
2008	692	2.999	0.023	318.147	-4607.930	4335.517
2009	681	3.250	0.018	75.487	-349.905	1840.752
2010	637	-6.873	0.017	179.079	-3276.901	1549.358
Operating earnings/Sales						
Year	N	mean	median	sd	min	max
2008	692	-3.482	0.033	48.240	-1016.145	215.561
2009	681	-0.756	0.030	12.380	-304.615	13.353
2010	637	-7.866	0.028	116.245	-2766.130	8.995

Source: AJPES (2011), and authors' own calculations. <u>Notes</u>: Net earnings and operating earnings are scaled by current period sales. Only companies with positive equity value

4.3   Methodology

We use Burgstahler and Dichev's (1997) frequency distribution of scaled net earnings and scaled operating earnings. However, instead of their test statistic, we use alternative *GRPV-statistics*, proposed by Garrod, Ratej Pirkovič and Valentinčič (2006), GRPV statistics more robust in highly variable small sample settings as it doesn't require a normal distribution assumption[8]. Consequently, this statistics is more suitable for testing our medium and large companies' subsamples. If discontinuity at zero exists (GRPV gives statistically significant result), we assume earnings shifts exist. Since distribution smoothness is also dependent on bin's width we determine interval's width by *Sturges's rule* and *Freedman-Diaconis formula* (Scott, 1992) to avoid artificial over- or under-smoothness (Hyndman, 1995).

Since some of the discontinuity can be attributable to true events, so we apply non-parametric *Wilcoxon matched-pairs signed-ranks test* (Wilcoxon, 1945), additionally: by quartiles we test medians of companies' income before income taxes (to exclude different tax positions of companies) and operating income (to control for financial assets and financial liabilities, also) whether they are the same. We apply this test on companies' quartiles (from more to less indebted companies) across various company sizes, since – according to Garrod el el. (2008) and Sweeney (1994) – indebted firms tend to report higher earnings.

5.   RESULTS

Based on the descriptive statistics (Tables 1 and 2), we turn our attention to distribution of net earnings and operating earnings (both scaled by beginning of the period assets) across different company sizes over 2008-2010 period. Figures 1 and 2 provide the results as follows. Figure 1 shows distribution of net income and operating earnings over 2008-2010 period. Figure 2 shows same distributions for large companies[9].

As can be seen from the distribution of net earnings across time and over different companies size groups, discontinuity around zero exist across time and over different companies' size groups. However, this is less the case in the distribution of operating earnings. Clearly, companies improve (in case of operating losses making companies) or deteriorate (in case of operating profit making companies) with their a) investment and financing activity and/or b) special items. In the setting of highly impaired access to finance and increasing financing costs the ability to improve earnings by investment/financing activity seem unlikely, especially since distributions show micro and small companies are equally inclined towards earnings shifts compared to medium sized and large companies which generally have more financial assets.

In order to test whether loss making companies truly have superior financial expertise, we performed a non-parametric *Wilcoxon matched-pairs signed-ranks test* on sub-samples of micro, small, medium-sized and large companies across all three years (see Table 3). Looking at the results of Wilcoxon test, lowest quartile companies (operating loss making companies) by companies' sizes, micro and small companies increase earnings by their investment/financing activity and special items (statistically significant higher number of income increasing than income decreasing companies). This activity is statistically significant even when we restrict the sample to companies with higher level of financial liabilities compared to financial assets (indebted companies). Given the current highly hampered setting, growing cost of finance, decreasing deposit interest rate and financial assets impairments these results are striking particularly in the light of medium sized and large companies. Namely, indebted large companies are not able to shift earnings upwards by financing income and/or special items. On the contrary, in 2010 financing income of indebted medium sized and large companies only worsened their operating results.

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[8] GRPV is binomially distributed.
[9] Scaling by current period sales gives consistent results. Results (including those for small and medium sized companies) are available upon request from the authors.
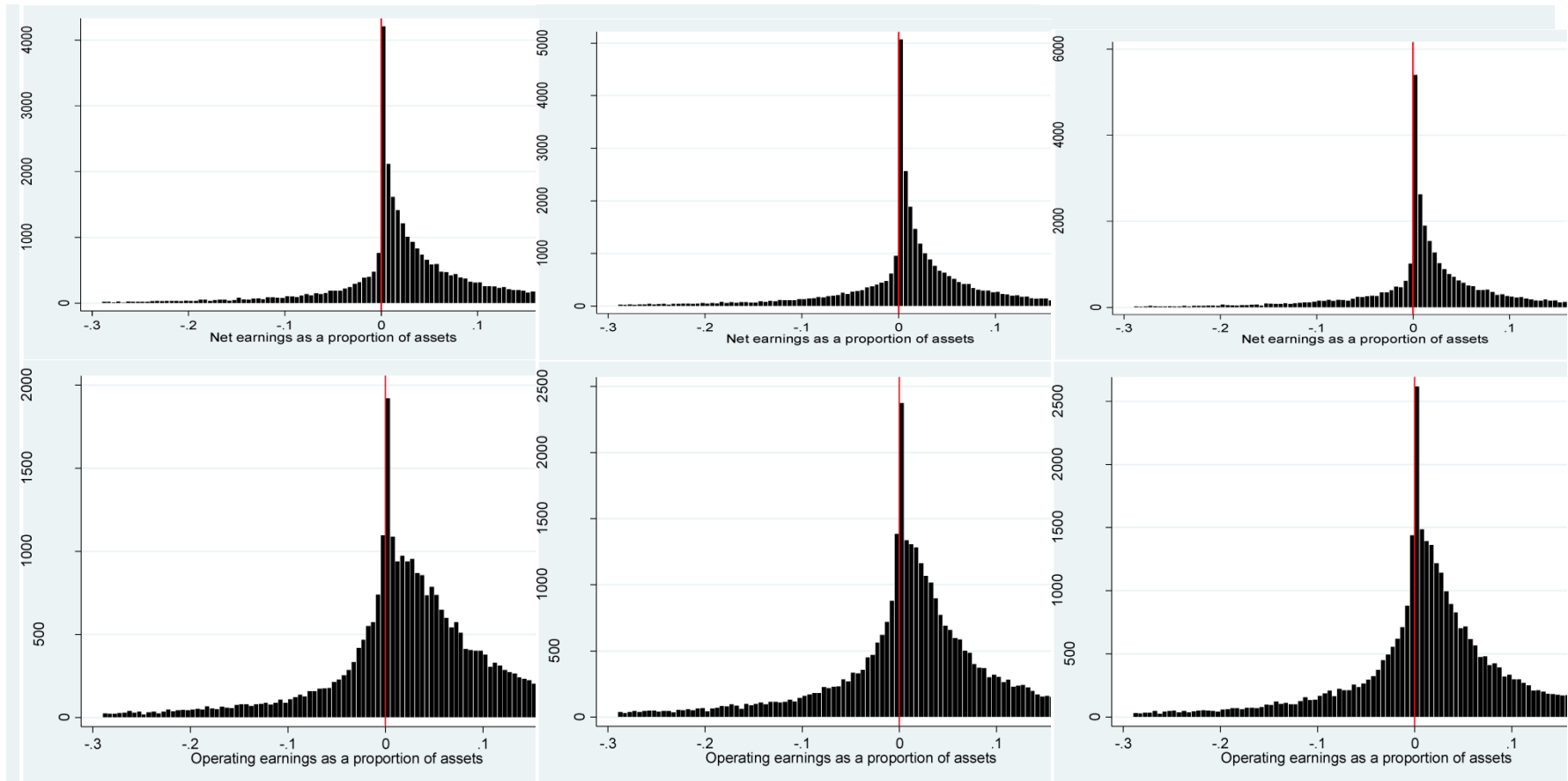
Figure 1: Distribution of net earnings and operating earnings from 2008-2010 for Slovenian micro companies

Source: AJPES (2011), and authors' own calculations. Notes: Net earnings and operating earnings are scaled by beginning of the period assets. Each column represents one period as follows (from left to right). 2008, 2009 and 2010. The distribution interval widths are 0.005 and the location of zero on the horizontal axis is marked by the solid line. Only micro companies with positive equity value.
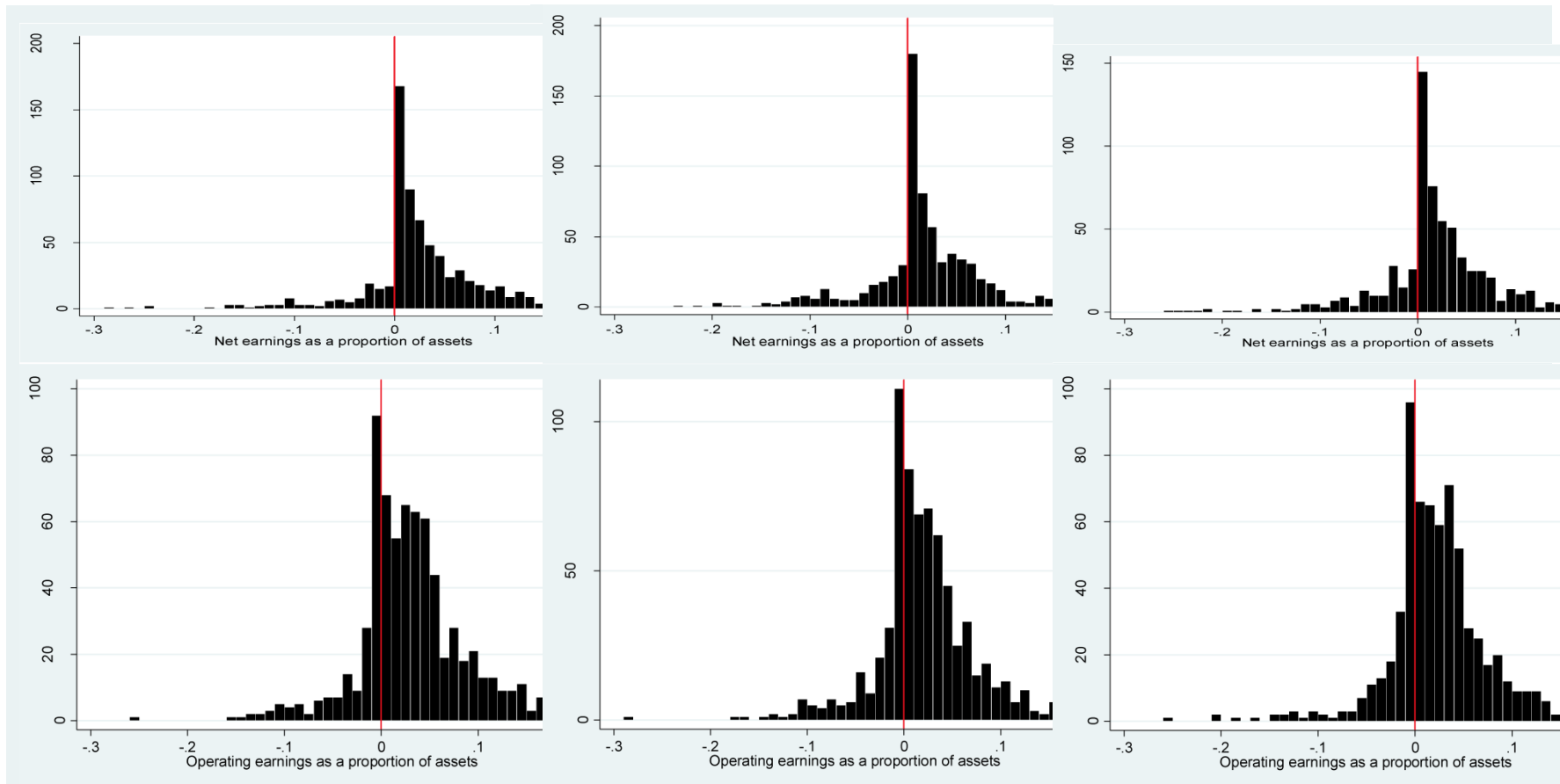
Figure 2: Distribution of net earnings and operating earnings from 2008-2010 for Slovenian large companies

Source: AJPES (2011), and authors' own calculations. <u>Notes</u>: Net earnings and operating earnings are scaled by beginning of the period assets. Each column represents one period as follows (from left to right). 2008, 2009 and 2010. The distribution interval widths are 0.01 and the location of zero on the horizontal axis is marked by the solid line. Only large companies with positive equity value.

Table 3: Wilcoxon matched-pairs signed-ranks test for operating earnings and earnings before taxes by size of the company for the 2008-2010 periods

Micro companies

All	min-p25			p25-p50			p50-p75			p75-max		
Year	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test
2008	2,254	5,734	-39.0***	4,055	3,504	12.2***	5,984	2,647	46.2***	4,767	3,782	23.9***
2009	2,640	5,790	-37.3***	3,186	4,378	-13.5***	6,087	2,817	44.2***	4,679	4,159	17.5***
2010	2,721	5,777	-36.7***	3,353	4,338	-11.1***	6,187	2,908	44.8***	4,815	4,185	19.4***
Indebted												
2008	1,669	3,150	-19.6***	3,255	2,100	23.8***	4,982	1,504	51.2***	3,546	1,980	33.0***
2009	2,047	3,430	-19.7***	2,528	2,487	3.6***	5,154	1,654	50.7***	3,516	2,198	29.6***
2010	2,076	3,437	-20.4***	2,615	2,511	4.1***	5,136	1,669	50.8***	3,512	2,286	27.9***

Small companies

All	min-p25			p25-p50			p50-p75			p75-max		
Year	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test
2008	280	283	-2.1**	477	85	15.8***	443	120	15.0***	374	187	9.3***
2009	232	346	-4.9***	427	152	11.7***	450	130	14.3***	347	231	5.9***
2010	262	305	-2.6***	428	138	11.8***	438	129	14.4***	334	232	6.5***
Indebted												
2008	246	181	1.3	436	52	16.2***	416	64	16.6***	310	84	12.3***
2009	216	253	-2.0**	394	99	13.2***	414	67	16.0***	294	98	10.4***
2010	234	217	0.1	385	75	14.1***	395	71	15.8***	282	113	10.0***

Medium sized companies

All	min-p25			p25-p50			p50-p75			p75-max		
Year	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test
2008	79	103	-1.3	150	31	9.0***	135	46	7.5***	112	68	3.7***
2009	86	100	-1.0	133	52	6.4***	141	45	7.8***	93	92	2.4**
2010	84	99	0.0	128	55	6.1***	146	37	8.9***	108	74	4.3***
Indebted												
2008	69	62	1.0	137	16	9.5***	126	21	8.5***	96	28	6.3***
2009	80	66	1.6	125	28	7.4***	129	21	9.3***	82	47	5.4***
2010	81	55	2.8***	118	31	7.6***	134	19	9.7***	86	34	5.9***

Large companies

All	min-p25			p25-p50			p50-p75			p75-max		
Year	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test	#Pos	#Neg	z-test
2008	71	114	-4.0***	108	76	1.4	145	40	7.8***	118	66	4.6***
2009	75	108	-2.8***	87	94	-0.8	139	44	6.6***	111	72	3.0***
2010	83	87	-1.1	97	73	0.3	128	42	5.8***	97	73	3.6***
Indebted												
2008	46	31	1.0	81	17	6.5***	123	13	9.0***	88	21	6.4***
2009	53	47	0.6	55	19	5.0***	113	14	8.3***	76	25	4.9***
2010	53	28	2.2**	63	14	5.1	100	13	8.0***	68	19	5.5***

Source: AJPES (2011), and authors' own calculations. Notes: earnings and operating earnings are scaled by beginning of the period assets. #Pos = number of positive shifts (income decreasing), #Neg = number of negative shifts (income increasing). Only companies with positive equity value. *** p<0.01, ** p<0.05, * p<0.1

6.   METHODOLOGICAL IMPLICATIONS AND LIMITATIONS

If companies intentionally manage earnings in some predetermined direction, this impacts distribution of earnings. However, distribution alone is not sufficient proof of earnings management, since company's tax status, special items and presence of financial assets (Dechow et al., 2003) can shift earnings, too. Thus, this analysis gives no evidence that micro and small companies manage financial income on purpose. On the other hand, it also doesn't provide any evidence that micro and small companies truly achieved superior financial income performance compared to medium sized and large companies. However, it demonstrates operating loss making micro and small companies are reporting statistically significant higher financing income compared to operating loss making medium and large companies.

Burgstahler and Dichev's (1997) earnings distribution approach is a useful and simple tool for rough estimation of events, related to earnings shifts, which are worthwhile to be studied by other analytical methods of earnings manipulation detection. By comparing distributions of different income statement items (net income, operating income, income before taxes, income before taxes and special items) and by employing different scaling technics (scaling by assets, sales, company's market value) in the same setting (country or industry), interesting phenomena like superior financial performance of otherwise loss making micro and small companies in the extreme environment with severely impaired access to financial resources like Slovenia can be extracted.

CONCLUSION

The purpose of this paper was to analyze the impact of financial crisis on distribution of earnings by various companies' sizes in a setting with severely impaired access to financial resource. Burgstahler and Dichev's (1997) cross-sectional distribution of earnings approach gives a fairly good insight also within the 2008-2010 crisis and shows statistically significant discontinuity of net earnings' distribution around zero.

Finally, more precise study of earnings distribution by various companies' sizes shows that earnings shifts occur more often among micro and small companies than medium sized and large companies, and despite of limited access to finance, rising funding costs and decreasing investment returns, micro and small companies making operating loss are recognizing statistically significant higher financing income compared to profit making micro and small companies and loss making medium sized and large companies.

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