

Solvency Risk of Silesian Trading Companies: Research Evidence¹

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Abstract

One approach to analyze the consequences of the impact of the global financial crisis on the real sphere of the economy is to follow the changes in different aspects of companies' financial performance, which may be measured with a set of selected financial ratios. The main aim of this paper is to examine extracted set of ratios indicating the level of solvency risk of the chosen business entities operating in trading sector in Silesian Region of Poland. The study indicated that on average the level of solvency risk of Silesian trading companies remained relatively stable and comparable to the level of typical Polish trading company. Also, in the analyzed sample of five chosen Silesian trading companies the changes of the observed solvency ratios remained on a relatively comparable level, with minor exceptions.

Key words

solvency risk, capital structure, financial balance, Silesian trading companies

JEL Classification: D22, G01, G32, G33

1. Introduction

The problem of the global financial crisis and its consequences is recently a common subject of researches, both theoretical and empirical ones. However, most of these are devoted to the global financial system and its elements (Cardarelli, Elekdag and Lall 2008; Jackson 2010; Kolb 2011). The consequences of the global financial crisis are often analyzed from the macroeconomic perspective and touch the problem of so called crisis contagion effect (Eichengreen and Rose 1999; Pritsker 2001; Dungey, Fry, Gonzalez-Hermosillo and Martin 2011). The global financial crisis may have impact on the real sphere economy through various transmission channels, affecting different aspects of company's activity (Blot, Le Bayon, Lemoine and Lévassieur 2009; Antony and Broer 2010; Dolignon and Roger 2010).

This study, however, is based on another approach of analyzing the consequences of the global financial crisis with regard to the phenomena observed in the real sphere of the economy. We assumed here, that the consequences of the global financial crisis can be manifold and very dangerous for the company's financial stability, starting with: limited

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access to capital, increased cost of capital, decreased sales or unpaid receivables. The list of potential problems for business entities is almost unlimited and the final consequence may be bankruptcy. Thus, it is possible to follow the consequences of crisis in the business entities by means of a set of financial ratios indicating different aspects of companies' financial performance (see more in: Błach, et al. 2012).

For that purposes we conducted a research project aiming at a comparative analysis of financial stability of business entities operating in Silesian Region (Poland) and in Poland in general in the time of the global financial crisis. We constructed original analytical model comprising four components (the CFS Watch Model⁵): (1) General Performance Assessment (GPA), (2) Debt Management Assessment (DMA), (3) Efficiency and Profitability Assessment (EPA) and (4) Financial Liquidity Assessment (FLA).

In this paper we aim at presenting partial results of the above mentioned research project. We aim here at examining extracted set of ratios included in the DMA module which indicated the problem of solvency risk in companies. We define solvency risk as a threat that a company will be unable to cover its liabilities in a long-run and is lacking financial balance (compare: Bender and Ward 2009, p.57; Ehrhardt and Brigham 2009, p. 607; Lumby and Jones 2011, p. 429). In particular, our intent is to compare the average levels of selected solvency ratios computed for the entire trading sector in Silesia and in Poland. Next, we analyze the fluctuations of the examined ratios for five chosen companies operating in trading sector in Silesia as compared to the average ratios for Silesian trading sector.

The remainder of the paper is organized as follows. In the second section we present methodology of our researches, including the characteristics of sampled data and the examined variables (embodied in selected financial ratios). In section three we present the findings and discussion and we conclude our study in section four.

2. Methodology

The research in the field of solvency risk analysis was carried in two stages. The first stage was dedicated to analyze the level of solvency risk in the typical Silesian trading company (referred to as *TS*) and then to compare it with the situation of the typical Polish trading company (referred to as *TP*). Solvency ratios of these typical companies were computed with the use of the aggregated data gathered on the regular basis by the GUS (Polish Central Statistical Office) in its statistical reports covering financial information of Polish business entities regarding their sector affiliation and geographical belonging. Thus, it was possible to extract data for trading companies operating in Poland and in Silesian Region. The GUS collects data derived from annual financial reports and two statistical reports required in Poland: F-02 financial report and F-03 report on the state and flow of the fixed assets. The GUS database covers companies with 10 and more persons employed. Among these, there are both companies keeping accounting ledgers or revenue and expense ledgers (Polish Central Statistical Office 2006-2011; Statistical Office in Katowice 2006-2011).

The second stage was planned to analyze the level of solvency risk of chosen trading Silesian companies and then to compare it with the ratios computed for the typical Silesian trading company (*TS*). The research was based on the financial data provided in the financial statements (mainly balance sheet and profit & loss account) of five chosen trading companies operating in the Silesian Region. All of the examined companies are listed on the Warsaw Stock Exchange. Due to the volume of their assets (above 40 billions of PLN), sales turnover (above 6 billions of PLN) and number of employees (higher than 100), these companies are

⁵ CFS Watch is an acronym of Corporate Financial Situation Watch.

regarded as the large ones. The core characteristics of the analyzed companies are presented in Table 1.

Table 1: Basic characteristics of the examined Silesian trading companies (valid as of 31/12/2012)

Data	Debut on the WSE	Total assets (in thousands of PLN)	Sales revenues (in thousands of PLN)	Number of employees
Company A	1995	40 677	56 890	410
Company B	1997	360 307	234 728	356
Company C	1999	1 573 144	4 953 885	238
Company D	2000	291 067	503 882	132
Company E	2007	55 307	6 009	201

The research period covers 6 years. For the purposes of the analysis we consider three phases: 1) 2005 -2007 as pre-crisis period, 2) 2007-2008 as crisis escalation period and 3) 2009-2010 as post-crisis period.

The data from financial statements of the five examined companies together with aggregated data for Silesian and Polish trading companies were used to compute basic solvency ratios (Damodaran 2001, p.105; Fabozzi and Peterson 2003, p.742; Higgins 2007, p.46; Ehrhardt and Brigham 2009, p.95; Błach 2010). These ratios form the DMA (Debt Management Assessment) module, which is one element of the CFS Watch Model (as mentioned previously). We selected the ratios that were applicable concerning the limitations of the available type of data in the aggregated reports provided by GUS. The examined solvency ratios, together with the interpretation adopted for the purposes of our research, are presented in Table 2.

Table 2: The examined solvency ratios and their interpretation

Ratio	Formula	Interpretation
DMA1	Total Debt Capital to Total Assets	<ul style="list-style-type: none"> - the increase of the ratio indicates the increase of solvency risk - high solvency risk if ratio is higher than 100%
DMA2	Total Debt Capital to Equity Capital	<ul style="list-style-type: none"> - the increase of the ratio indicates the increase of solvency risk - high solvency risk if ratio is higher than 200%
DMA3	Long-term Debt Capital to Equity Capital	<ul style="list-style-type: none"> - the increase of the ratio indicates the increase of solvency risk - high solvency risk if ratio is higher than 100%
DMA4	(Equity Capital plus Long-term Debt Capital) to Fixed Assets	<ul style="list-style-type: none"> - the decrease of the ratio indicates the increase of solvency risk

In order to support our findings within the changes of solvency risk level we used basic descriptive statistics. These computations, together with the achieved values of solvency ratios are provided in Annex 1 and 2.

Our research aims at testing the following hypotheses:

H1: In the period of financial crisis the level of solvency risk increased significantly both in typical Polish (*TP*) and typical Silesian (*TS*) trading companies.

H2: There are no significant differences between the level of solvency risk of typical Silesian company (*TS*) and particular analyzed companies.

3. Findings and discussion

The results of the comparative analysis of the examined solvency ratios of typical Silesian trading company (*TS*) and typical Polish trading company (*TP*) are provided in Fig. 1.

The application of debt capital in financing company's assets (DMA1 ratio) in typical Silesian trading company was higher than in typical Polish trading company only in the first period (years 2005-2006). In the next period a typical Silesian trading company was characterized by lower level of debt financing as compared to typical Polish trading company with clearly decreasing tendency indicating the lowering level of solvency risk. It should be stressed, that in all observations (both for *TP* and *TS* companies) the level of solvency risk was relatively low and accepted without any significant changes in the capital structure (compare Annex 1 and 2).

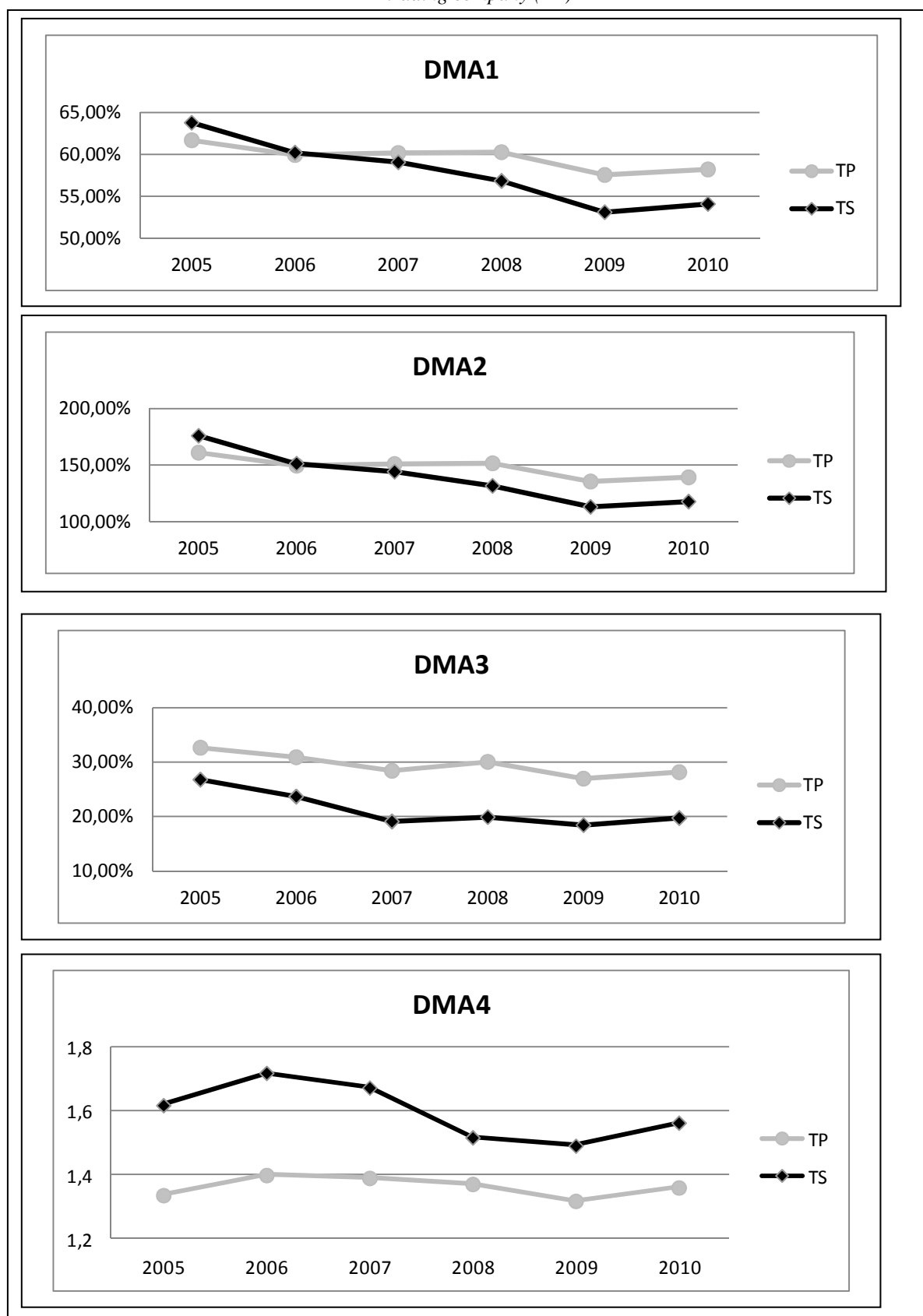
As to the DMA2 ratio, both in case of typical Polish (*TP*) and Silesian trading (*TS*) companies, the decreasing tendency was clearly visible, indicating lowering level of solvency risk. At the beginning *TS* company was characterized by higher level of debt to equity ratio as compared to the *TP* company (years 2005 and 2006). Then the situation changed and since 2007 lower level of debt was observed in *TS* company (which reinforces the findings of the DMA1 ratio analysis). In both cases, the DMA2 ratio was always below 200% which informs about relatively low level of solvency risk.

While analyzing the results of DMA3 ratio for *TS* and *TP* companies, the decreasing tendency can be also observed in both cases, however lower results were achieved by the typical Silesian company (*TS*) indicating lower usage of long-term debt as compared to typical Polish (*TP*). It should be also added, that the results for both companies were very low, indicating very low level of solvency risk.

In case of the DMA4 ratio, better situation was observed in typical Silesian company (*TS*) as compared to typical Polish company (*TP*) regarding the financial balance and long-term stability, as the results for this ratio were higher in all observations. However the ratio was fluctuating more visibly in case of typical Silesian company. It is worth noticing that all observations for *TS* and *TP* companies indicated the maintenance of the financial balance and low level of solvency risk.

Concluding, the results for the solvency ratios calculated for both companies proved that, the typical Silesian trading company (*TS*) followed the same pattern of financing as the typical Polish trading company (*TP*) and as a consequence it was exposed to the similar level of solvency risk. Additionally, no significant changes in the level of solvency risk was observed in the analyzed period and it stayed at relatively low level (compare the results of solvency ratios in Annex 1 and their descriptive statistics in Annex 2).

Figure 1: Comparison of selected solvency ratios for typical Silesian trading company (TS) and typical Polish trading company (TP)



The second area of comparisons covered the problem of differences between the level of solvency risk in the examined five chosen trading companies and the typical Silesian trading company (*TS*). The results of this analysis are provided in Fig. 2. On the graphs, the labels are provided in case of companies which results are significantly different from the tendency of *TS*.

Regarding the DMA1 ratio, the lowest level of debt financing and due to this, the lowest level of solvency risk was observed in company *D*. Also company *B* and *A* were characterized by lower level of financial risk as compared to typical Silesian trading company (*TS*). On the contrary, the DMA1 ratios computed for company *C* indicated strong preference for the debt financing, resulting in higher level of solvency risk as compared to the situation of *TS* company. In case of company *E*, the dynamically increasing values of debt to assets ratio with visible upward tendency were observed. In 2009 and 2010 the DMA1 ratio reached over 100% due to the financial loss resulting in negative equity capital, thus the situation of company *E* can be assessed as very difficult due to very high level of solvency risk.

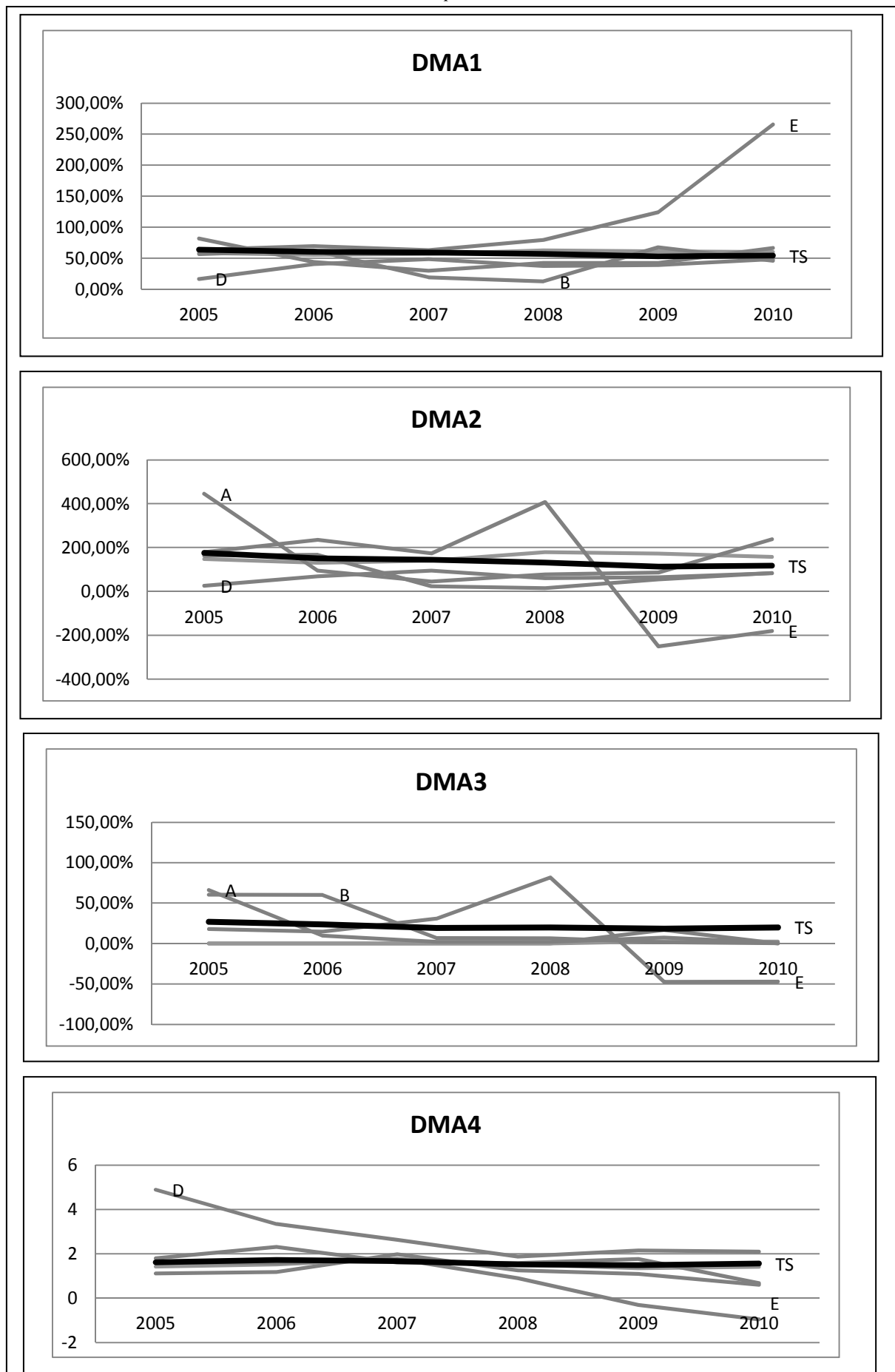
As to the second ratio – DMA2 – very low values were observed in company *D* and *B*, lower than in typical trading company (*TS*). Relatively low level of solvency risk was also observed in company *C* (below 200%). On the contrary, the company *E* and *A* were achieving higher results of DMA2 ratio than in company *TS*. In case of the company *E*, the situation become particularly dangerous in 2009 and 2010 when equity capital decreased below zero due to the financial loss. The worst results in company *A*, regarding the safety of capital structure, were observed in 2005 and 2010 indicating very high level of solvency risk.

The analysis of the DMA3 ratio indicated that the companies *D* and *C* were using long-term debt only temporarily and at very low level, much below the results of *TS* company. This may signal problems with access to long-term debt capital or may inform about the management decisions giving priority to the short-term sources of debt finance. The results of DMA3 ratio for the company *B* and *A* were fluctuating in the analyzed period, ending with lower level of long-term debt financing in 2010 as compared to 2005. In case of company *E*, the level of long-term debt was increasing due to the problems of negative equity capital (in 2009 and 2010) indicating very high level of solvency risk.

The last ratio – DMA4 – informs about financial balance and long-term stability. The highest level of DMA4 ratio was observed in case of company *D*, indicating very stable and safe situation due to financial balance maintenance. Similar situation was observed in company *C*. In company *B* and *A* good situation was observed at the beginning, then it got worst and ended with financial imbalance in 2010, indicating potential problems with long-term stability and solvency (ratios got down below 1,0). However, the highest level of solvency risk was observed in company *E* where DMA4 ratios decreased below zero in 2009 and 2010 (due to negative equity capital).

Concluding, most of the observations indicated that the level of solvency risk of chosen examined companies was quite similar to the level of solvency risk of the typical Silesian trading company (*TS*). The differences between the observed ratios were not significant in many cases (see Annex 1 and 2). However, the best situation and the lowest level of solvency risk (even below the level of risk observed in the typical company *TS*) was noticed in company *D*. The worst situation and the highest level of solvency risk was observed in company *E*. The results for company *A*, *B* and *C*, although fluctuating, were quite comparable to these characterizing the typical Silesian company (*TS*) (compare the results of descriptive statistics in Annex 2).

Figure 2: Comparison of selected solvency ratios for typical Silesian trading company (TS) and chosen trading companies



4. Conclusions

The global financial crisis may cause the limited access to capital for companies as financial institutions became more prudent and pay higher attention to the problem of credit risk. However, in companies' balance sheets the capital structure may thus improve and the financial ratios may indicate lower level of solvency risk. On the other hand, due to the crisis contagion reflected in the worsening of the conditions of the business environment, companies may have significant problems with paying back their current debts, which may increase the burden of liabilities and worsen financial solvency. If a company faces the reduction of its equity due to the loss of profits, the solvency risk will even increase. It seems that in the examined exemplary Silesian trading companies all of the above specified phenomena could occur.

As mentioned previously, in this context two plausible hypotheses were examined. With regard to the first hypothesis, stating that in the period of financial crisis the level of solvency risk increased significantly both in typical Polish (*TP*) and typical Silesian (*TS*) trading companies, no evidence was found. No significant changes of the examined ratios were found, thus there were no significant changes of the level of solvency risk. In particular, no significant differences were indicated by the levels of coefficient of variation. Additionally, we observed similar pattern of financing for both the typical Polish trading company (*TP*) and the typical Silesian trading company (*TS*).

With regard to the second hypothesis stating that there were no significant differences between the level of solvency risk of typical Silesian trading company (*TS*) and particular chosen companies, only partial evidence was found. Among the analyzed companies there are examples of these that in the entire analyzed period (2005-2010) achieved solvency ratios better than on average (so the ratios of typical Silesian trading company). On the other hand, there are examples of companies which achieved ratios worse than on average. However, a graphic comparison of the achieved results indicated that in most of the observations the ratios were on comparable levels and did not fluctuate significantly. The exception was one of the examined companies (company *E*) in which all of the analyzed ratios the indicated solvency risk was significantly higher than in case of the typical company (*TS*). This leads to the conclusion that the level of solvency risk is not strictly connected with the sector affiliation, as many more variable factors influence the level of company's debt.

The problem of solvency risk analyzed in this paper constitutes only one part of the broad analysis of the financial crisis influence on the situation of the business entities, therefore it should be regarded only as introductory approach to this phenomenon. Complete analysis of the financial crisis impact requires multispectral studies.

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Annex 1. Chosen ratios calculated for the analyzed companies

Ratios	2005	2006	2007	2008	2009	2010
DMA1(A)	81,65%	43,90%	29,71%	42,38%	42,29%	66,32%
DMA1(B)	56,42%	62,79%	19,02%	12,76%	67,65%	45,79%
DMA1(C)	58,39%	55,35%	56,93%	62,80%	61,33%	60,06%
DMA1(D)	16,56%	40,43%	48,40%	37,39%	38,88%	48,74%
DMA1(E)	63,69%	69,65%	63,09%	79,51%	124,27%	265,54%
DMA1(TP)	61,69%	59,94%	60,17%	60,27%	57,56%	58,22%
DMA1(TS)	63,77%	60,21%	59,06%	56,85%	53,12%	54,11%
DMA2(A)	445,07%	94,26%	44,96%	77,92%	85,76%	238,00%
DMA2(B)	163,12%	167,11%	23,48%	14,62%	55,03%	84,00%
DMA2(C)	148,13%	130,12%	140,44%	178,43%	172,00%	157,51%
DMA2(D)	25,57%	69,22%	95,23%	60,25%	64,43%	83,12%
DMA2(E)	178,58%	234,54%	173,20%	407,27%	250,16%	180,95%
DMA2(TP)	161,05%	149,60%	151,00%	151,70%	135,60%	139,30%
DMA2(TS)	176,00%	151,30%	144,20%	131,70%	113,30%	117,90%
DMA3(A)	66,33%	9,72%	2,19%	1,99%	7,35%	0,84%
DMA3(B)	60,47%	60,23%	6,90%	6,56%	1,60%	0,45%
DMA3(C)	0,00%	0,00%	0,00%	0,00%	2,65%	2,32%
DMA3(D)	0,00%	0,00%	0,00%	0,00%	16,69%	0,00%
DMA3(E)	17,93%	14,72%	30,71%	81,67%	47,40%	47,17%
DMA3(TP)	32,65%	30,90%	28,41%	30,05%	26,97%	28,15%
DMA3(TS)	26,78%	23,67%	19,10%	19,90%	18,44%	19,74%
DMA4(A)	1,112	1,178	1,984	1,254	1,091	0,605
DMA4(B)	1,798	2,315	1,611	1,587	1,771	0,677
DMA4(C)	1,427	1,526	1,763	1,516	1,347	1,415
DMA4(D)	4,898	3,351	2,630	1,873	2,154	2,099
DMA4(E)	1,618	1,587	1,762	0,898	-0,306	-0,953
DMA4(TP)	1,336	1,399	1,390	1,371	1,318	1,360
DMA4(TS)	1,618	1,719	1,673	1,517	1,491	1,563

Annex 2. Descriptive statistics of the analyzed ratios

Ratios	x_{\max}	x_{\min}	R	\bar{x}	$S(x)$	$V(x)$
DMA1(A)	0,8165	0,2971	0,5194	0,5104	0,1745	0,3420
DMA1(B)	0,6765	0,1276	0,5489	0,4407	0,2110	0,4787
DMA1(C)	0,6280	0,5535	0,0745	0,5914	0,0254	0,0430
DMA1(D)	0,4874	0,1656	0,3218	0,3840	0,1072	0,2791
DMA1(E)	2,6554	0,6309	2,0245	1,1096	0,7222	0,6509
DMA1(TP)	0,6169	0,5756	0,0413	0,5964	0,0137	0,0230
DMA1(TS)	0,6377	0,5312	0,1065	0,5785	0,0364	0,0629
DMA2(A)	4,4507	0,4496	4,0011	1,6433	1,3967	0,8499
DMA2(B)	1,6711	0,1462	1,5249	0,8456	0,6121	0,7239
DMA2(C)	1,7843	1,3012	0,4831	1,5444	0,1693	0,1096
DMA2(D)	0,9523	0,2557	0,6966	0,6631	0,2171	0,3274
DMA2(E)	4,0727	1,7320	2,3407	2,3745	0,8144	0,3430
DMA2(TP)	1,6105	1,3560	0,2545	1,4804	0,0842	0,0569
DMA2(TS)	1,7600	1,1330	0,6270	1,3907	0,2124	0,1527
DMA3(A)	0,6633	0,0084	0,6549	0,1474	0,2329	1,5802
DMA3(B)	0,6047	0,0045	0,6002	0,2270	0,2672	1,1773
DMA3(C)	0,0265	0,0000	0,0265	0,0083	0,0118	1,4190
DMA3(D)	0,1669	0,0000	0,1669	0,0278	0,0622	2,2361
DMA3(E)	0,8167	0,4740	1,2907	0,0841	0,4509	5,3617
DMA3(TP)	0,3265	0,2697	0,0568	0,2952	0,0190	0,0643
DMA3(TS)	0,2678	0,1844	0,0834	0,2127	0,0297	0,1398
DMA4(A)	1,9845	0,6050	1,3794	1,2040	0,4067	0,3378
DMA4(B)	2,3145	0,6771	1,6374	1,6265	0,4876	0,2998
DMA4(C)	1,7631	1,3474	0,4157	1,4992	0,1328	0,0886
DMA4(D)	4,8980	1,8734	3,0246	2,8342	1,0404	0,3671
DMA4(E)	1,7616	-0,9528	2,7144	0,7676	1,0419	1,3573
DMA4(TP)	1,3990	1,3180	0,0810	1,3623	0,0284	0,0209
DMA4(TS)	1,7190	1,4910	0,2280	1,5968	0,0815	0,0511