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THE ANALYSIS OF FINANCIAL STRUCTURE IN THE LARGEST ENTERPRISES IN SERBIA[*]

Analiza strukture finansiranja najvećih preduzeća u Srbiji

Abstract

The subject of this paper is financial structure of the largest enterprises in Serbia according to the criterion of the amount of operating revenues. The financial structure includes all sources of funding. It represents the structure of liabilities of the enterprise towards the owners, creditors, suppliers and other stakeholders. The aim of this paper is to identify changes and establish the regularities in the trends of financial structures in the largest enterprises in the period after the outbreak of the Great Recession (2008-2014). The research sample comprises 186 enterprises.

The research results show that greatest majority of vital enterprises in Serbia are undercapitalized and at high risk of bankruptcy. The main features of the financing structure of the largest enterprises in the reporting period were over-indebtedness and unfavorable maturity structure, with a trend of further deterioration. The research will also show the impact of financial structure on the profitability of enterprises and the level of risk of bankruptcy on the basis of Z-score adapted to developing countries.

Key words: *financial structure, large enterprises, financial leverage, Z-score, credit rating*

Sažetak

Predmet posmatranja ovog rada je struktura finansiranja najvećih preduzeća u Srbiji prema kriterijumu visine poslovnih prihoda. Struktura finansiranja obuhvata sve izvore finansiranja. Ona predstavlja strukturu obaveza preduzeća prema vlasnicima, kreditorima, dobavljačima i ostalim interesnim grupama. Cilj rada je da identifikuje promene i utvrdi pravilnosti u kretanju strukture finansiranja najvećih preduzeća u periodu nakon izbijanja Velike recesije (2008-2014). Uzorak na kojem je izvršeno istraživanje čini 186 preduzeća.

Rezultati istraživanja će pokazati da je većina vitalnih preduzeća u Srbiji potkapitalizovana i sa visokim rizikom bankrotstva. Glavne odlike strukture finansiranja najvećih preduzeća u posmatranom periodu su prezaduženost i nepovoljna ročna struktura, sa trendom daljeg pogoršanja. Istraživanje će, takođe, pokazati kakav je uticaj strukture finansiranja na profitabilnost preduzeća kao i visina rizika bankrotstva na bazi Z-skora prilagođenog zemljama u razvoju.

Ključne reči: *struktura finansiranja, velika preduzeća, finansijski leveridž, Z-rezultat, kreditni rejting*

Introduction

In 2014, there were 93,150 active enterprises in Serbia with a total of 967,199 employees. Compared to 2013, the total number of enterprises fell by 1,212 while the number of employees decreased by 23,831 [15]. According to the current Law on Accounting [11], from 2013, large enterprises include those enterprises that meet two of the following three criteria: 1) have more than 250 employees; 2) have average value of assets over EUR 17.5 million; and 3) have operating revenues above EUR 35 million.[1] Before the entry into force of this Act, the criteria in terms of the amount required, which are related to large enterprises, were significantly lower.[2] Consequently, the number of large enterprises was significantly higher than the number of large enterprises classified in accordance with current law. In 2013, there were 915 large enterprises (0.97%) in Serbia while in 2014 there were 494 large enterprises (0.53% of the total number of enterprises).

Although their ratio in the total number of enterprises is small, the importance of large enterprises is reflected in the following data: they employed 42.7% of the total number of employees, they made 38.6% of total turnover and 50.5% of the total Gross Added Value in 2014 [15].

This paper focuses on the largest enterprises in Serbia according to the criterion of the amount of operating revenues. The choice of this criterion was based on the idea to analyse the big businesses and agile enterprises that have the highest level of business activity, although some of them operate with losses (sometimes even greater than the level of equity). Having in mind the specific nature of their financial structure, enterprises from the financial sector (the largest banks and insurance companies) have been excluded from the sample, as well as enterprises with incomplete data[3]. Finally, the sample that was used

for research comprises 186 enterprises.[4] The aim is to identify changes and establish the regularities in the trends of financial structures in the largest enterprises in the period after the outbreak of the Great Recession (2008-2014). Data source present regular financial reports of observed enterprises from database of Cube Risk Management Solutions[5].

The survey sample was very heterogeneous in terms of business activity, legal form and business head office of the observed enterprises. The largest share belonged to the enterprises in the processing industry (37%), followed by trade (35%) and electric power supply (9%). Sample structure by sectors is presented in Figure 1. In terms of their legal form, 39 enterprises were joint stock companies (21%), 13 were state-owned enterprises (7%), while 134 enterprises were limited liability companies (72%). The largest number of the largest enterprises was based in Belgrade (46%) and Vojvodina (27%).

Figure 1: Sample structure by sectors [Author]
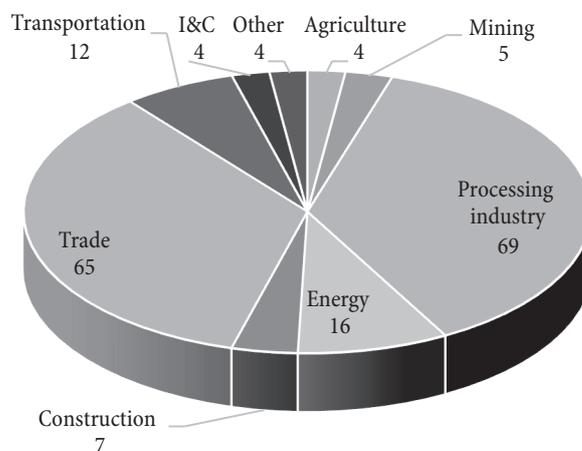
The term and characteristics of financial structure

According to the criterion of source or origin, funding sources are classified as own and borrowed, while according to the criterion of maturity, they are classified as short and long term sources. This paper deals with the

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1   The provisions of this Law have been applying beginning with the financial statements that are prepared on 31/12/2014.

2   According to the previous Law [10], large enterprises included those enterprises that meet two of the following three criteria: 1) have more than 250 employees; 2) have average value of assets over EUR 5 million; and 3) operating revenues above EUR 10 million.

3   For example, "EPS Snabdevanje" was established in 2013, thus the lack of data for the entire period observed.

4   For 2014, the sample comprised 180 enterprises, given that, as of 1 December 2015, there are no publicly available data for 6 enterprises observed.

5   Cube Risk Management Solutions is an enterprise operating in the field of business information, statistics, business intelligence and credit risk [3].

financial structure that includes all sources of funding. The financial structure is the structure of liabilities of an enterprise towards the owners, creditors, suppliers and other stakeholders.

Financial structure is often equated with capital structure, which is a narrower term. Capital structure is the ratio of debt to equity from which business enterprises are funded. Literature offers different interpretations of the capital structure, depending on how it defines debt. Some authors include long-term debt (bank loans, debt from bond issues, etc.), others include short-term loans as well (including debt from emissions of short-term securities), while some equate debt with the overall liabilities (including spontaneous sources of funding). Most often, capital structure includes only long-term funding sources (the traditional approach) [9, p. 116]. Given that short-term debt had a continuous growth and dominated total liabilities of enterprises in Serbia, observing capital structure in the traditional (narrow) sense, would not provide a realistic picture of the financial position of enterprises and the risks to which financers and other stakeholders are exposed. For this reason, this paper has a broader focus and deals with the financial structure.

The importance of financial structure stems from a wide range of impacts that it generates. Financial structure influences risk, expectations, profitability, financial flexibility, managerial flexibility, as well as the strategy of the enterprise [8], [9, p. 131]. With this in mind, the decision on the financial structure is not just financial, but also a strategic decision. The importance of capital (and financial) structure is reflected in the fact that it has been the focus of financial theory and practice for very long time. From times of Modigliani and Miller (1958) until modern days, there have been many theories, the most significant being the Static Trade-Off Theory and the Pecking Order Theory.

Financial structure is affected by a large number of factors that are divided into two groups: internal and external. Internal factors are those related to the specifics of a particular enterprise (enterprise-specific variables). The most important internal factors are: the size of the enterprise, assets tangibility, the volatility of profits (and cash flow), profitability, growth opportunities etc.

[7]. External factors are related to the characteristics of the industry and macroeconomic context. There are industries with high levels of financial leverage: the airline industry, steel industry, healthcare industry etc. On the other hand, certain industries are characterized by a low level of financial leverage, such as: food industry, pharmaceutical industry, Internet providers and others. The financial structure of an enterprise largely depends on the macroeconomic indicators, such as growth rate, inflation rate, unemployment rate, cost of capital, exchange rate and others.

Serbian economy is one of the economies with a delay in economic development and a delay in transition. The economy is characterized by a large number of structural imbalances that are the result of wrong transition goals of and inadequate tools for economic policies making. The global economic crisis, which broke out in 2008 and that is still ongoing in our region, only reinforced the consequences of structural imbalance and increased exposure of economy to risk factors [5].

Our economy is permanently under the threat of insolvency, primarily due to low economic base. Since 2000, the economy has recorded relatively high growth rates. Nevertheless, it has not reached the level of production from the beginning of the transition, in 1990. In addition, the trend of positive growth was interrupted by the outbreak of the crisis, after which the economy has either stagnated or entered into periodic recessionary phases [6].

Opportunities for enterprises to use alternative sources of funding are directly dependent on the development of the financial system, especially the capital market. The financial sector in Serbia has a "bank-centric" character. The capital market is shallow and contracting. In early 2015, the market capitalization of the Belgrade Stock Exchange amounted to around EUR 7 billion. In the conditions of underdevelopment of capital markets, debt remains a dominant source of external financing. Savings exceeds EUR 9 billion.

The primary focus of this paper is on individual enterprises. The calculated indicators for individual enterprises were used to calculate average indicators for the entire sample. Monitoring macroeconomic indicators and aggregate financial indicators provides an insight into

the general state of an economy. The downward trend of an economy certainly means that enterprises have poorer performance on average. However, it is more important than this average is to identify which enterprises are pulling that average. Is it a merit of a few enterprises, a certain sector or a common feature of all enterprises? Losses of unprecedented scale generated by certain enterprises, which dominate the aggregate sizes and average, fully offset the results and reduce the visibility of successful enterprises that are, may and must be the engine of the local economy.

It is necessary to make a clear distinction between successful and unsuccessful enterprises, profitable and unprofitable ones, those which are not indebted and those heavily indebted, less and more risky, between those in expansion and those in contraction, etc. The current state of the economy could be improved in two ways: by preventing further downfall of unsuccessful enterprises and/or by energizing those that are in expansion, or have growth potential. This requires focus on the enterprise. Therefore, the aim of this paper is to increase the visibility of an individual enterprise.

Financial structure indicators

A number of indicators may be used to measure financial structure. They are calculated as a ratio of debt or liabilities, on the one hand, and equity or assets of the enterprise, on the other hand. These indicators are often referred to as indicators of financial leverage because they serve as a measure of acceptability of ways of financing enterprises from borrowed sources [12, p. 94]. To calculate those, it is possible to use book values and market values for the balance sheet positions referred to. The use of market values is characteristic for developed market economies, while book value is generally accepted and applicable globally.

This study uses five basic indicators of financial structure: 1) the equity/total assets ratio; 2) the long-term liabilities/total assets ratio; 3) the short-term liabilities/total assets ratio; 4) the debt[6]/total assets ratio; and 5) the interest coverage ratio. Book values were used for calculating the values of the indicators. The key reason for this is the lack of data on the market value of enterprises, considering that in Serbia, and therefore in the sample, most enterprises are not listed in the financial market. The indicators were calculated for each individual enterprise in the sample. The indicators of the observed enterprises were then used to calculate average values for the sample as a whole. Two central tendency measures were used: arithmetic average (mean) and median. Median has great informative power given that, unlike average value, it is not sensitive to extreme values. The overview of financial structure indicators for the largest enterprises in Serbia is shown in Table 1.

All indicators in the paper are average sizes for the year, with the exception of 2008 where the indicators are related to 31 December since the earliest available financial statements are those as of 31/12/2008. The indicators for 2014

Table 1: Financial structure indicators of the largest enterprises in Serbia
[Author's calculation based on data from [3]]

		2008	2009	2010	2011	2012	2013	2014
Equity / Total assets	Average	0.38	0.35	0.33	0.32	0.33	0.32	0.31
	Median	0.35	0.33	0.34	0.33	0.34	0.36	0.35
Long-term liabilities / Total assets	Average	0.18	0.18	0.18	0.18	0.18	0.17	0.17
	Median	0.09	0.09	0.10	0.11	0.11	0.10	0.10
Short-term liabilities / Total assets	Average	0.44	0.47	0.49	0.50	0.49	0.51	0.53
	Median	0.39	0.42	0.47	0.44	0.44	0.47	0.48
Debt / Total assets	Average	0.32	0.32	0.33	0.33	0.32	0.31	0.32
	Median	0.28	0.30	0.30	0.28	0.27	0.25	0.22
EBIT/ Interest expense	Average	4.03	3.21	3.96	4.08	2.16	4.99	4.18
	Median	1.25	1.59	1.58	1.95	1.56	2.21	1.56

6 Debt being sum of long term liabilities and short term financial liabilities [7].

were calculated based on a sample of 180 enterprises, given that there were no publicly available financial statements as of 1 December 2015 for 6 observed enterprises.

As already mentioned, equity can be used in the denominator of these indicators. However, the problem is the growing number of enterprises operating with loss over equity. In enterprises with equity position of zero, or with loss over equity (negative equity), the calculation of these indicators does not make sense and is, therefore, not done. Consequently, the use of these indicators would prevent mutual comparison of enterprises and call into question all of aggregate sizes at the level of the sample. With the entry into force of the new Law on Accounting, there was a change in disclosing loss over equity, which is now disclosed on the right side of the balance sheet.

In the year of the outbreak of the global financial crisis equity share in total assets of the largest enterprises in Serbia was 38% on average, while the share of long-term liabilities and short-term liabilities amounted to 18% and 44%, respectively. Year after year, financial structure has gradually changed in favour of the short-term sources of funding which, in 2013 and in 2014, surpassed total long-term sources (see Figure 2). The average value of debt/total assets ratio was the same in the first and last year of observation (32%), while interest coverage ratio increased from 4.03 to 4.18.

Median values of these indicators point to important facts. Firstly, in contrast to the average, the median of

equity/total assets ratio changed minimally, with the same value in the initial and last year of observation (35%). This means that half of the enterprises surveyed had equity share above 35%, while the other half of the enterprises was below this threshold both in 2008 and 2014. Given that the average value of this indicator decreased, it means the enterprises below this limit have more extreme (low) value. The immediate suspect is contributions of enterprises with losses over equity. Further analysis will show the real reasons. Secondly, the share of long-term liabilities to total assets was almost unchanged. Thirdly, the median of the current liabilities/total assets ratio increased from year to year, indicating that in 2008, half of the surveyed enterprises had a share of current liabilities of over 39%, whereas in 2014, half of the enterprises had a share above 48%. Fourthly, in terms of the debt/total assets indicator share, there is an opposite situation compared to the first indicator. The average value of this indicator was unchanged, but the median fell by 6 percentage points, which may be attributed to growth in operating liabilities, which will be discussed further. Finally, the median of the interest coverage ratio is higher comparing to 2008.

The above data clearly show a trend of rising indebtedness of the largest enterprises in Serbia. The share of total liabilities to assets increased from 62% in 2008 to 69% in 2014. In order to gain a deeper insight into debt at the enterprise level, Table 2 shows distribution of levels of

Figure 2: Trend of financial structure [Author]
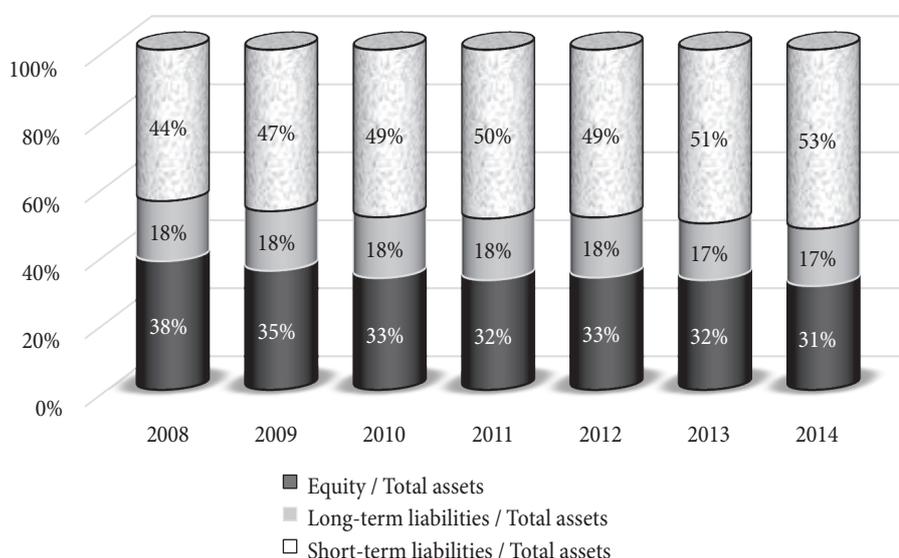
Table 2: Number of enterprises with different shares of liabilities in total assets [Author's calculation]

Total liabilities / Total assets	2008	2009	2010	2011	2012	2013	2014
<20%	21	14	14	13	11	14	15
20% - 40%	31	31	28	32	35	32	32
40% - 60%	34	37	35	38	32	37	36
60% - 80%	46	45	54	53	52	50	46
80% -100%	43	44	35	30	37	36	34
100%-120%	5	10	11	10	7	7	3
120% - 140%	3	0	1	1	6	0	3
>140%	3	5	8	9	6	10	11

indebtedness, or the number of enterprises with different shares of total liabilities in assets.

For most enterprises the share of liabilities in equity varies between 60-80%. If all enterprises are roughly divided into two categories, the conservative (with liabilities below 50%) and aggressive (with liabilities above 50%) it is clear that the latter category dominates. What is of particular concern are enterprises whose liabilities exceed the value of total assets (over 100%). It is clear from the table that these enterprises were plunging deeper into losses year after year (three times the number of enterprises with liabilities greater than 140% of total assets compared to 2008). The level of indebtedness of one enterprise exceeded even 300%.

In the period from 2008 to 2014, the 29 enterprises in the sample had losses over equity in one year minimum (usually in more than three years). To isolate and measure the impact of these, so-called business-controversial enterprises, the entire sample was divided into two groups: enterprises with positive equity value (157 enterprises) and enterprises with a negative equity value (29 enterprises). Average financial structure indicators for these two groups of enterprises are shown in Table 3.

Enterprises with positive equity exhibited stability in terms of the level of indebtedness. Average and median barely changed which is a mitigating factor in view of the trend for the entire sample. The share of total liabilities in the assets of these enterprises was around 56% on average. However, there was a noticeable change in the maturity of these liabilities (a reduction in long-term liabilities and a growth in short-term liabilities). In the second group of enterprises, the situation was alarming because the level of indebtedness was growing rapidly year by year. The average share of total liabilities in the assets of these enterprises increased by 50% compared to 2008. Such enormous growth in indebtedness was the result of

Table 3: Financial structure for enterprises with positive and with negative equity [Author's calculation]

		2008	2009	2010	2011	2012	2013	2014
Companies with positive equity value								
Total liabilities / Total assets	Average	0.56	0.56	0.57	0.56	0.56	0.56	0.55
	Median	0.58	0.59	0.61	0.58	0.61	0.59	0.57
Long-term liabilities / Total assets	Average	0.14	0.13	0.13	0.13	0.13	0.12	0.11
	Median	0.08	0.08	0.09	0.10	0.09	0.09	0.09
Short-term liabilities / Total assets	Average	0.42	0.43	0.44	0.43	0.43	0.43	0.44
	Median	0.38	0.41	0.42	0.41	0.41	0.40	0.41
Companies with negative equity value								
Total liabilities / Total assets	Average	0.95	1.13	1.23	1.29	1.25	1.32	1.47
	Median	0.91	1.01	1.05	1.09	1.04	1.09	1.21
Long-term liabilities / Total assets	Average	0.39	0.42	0.46	0.46	0.43	0.40	0.47
	Median	0.29	0.34	0.34	0.41	0.44	0.23	0.32
Short-term liabilities / Total assets	Average	0.56	0.71	0.78	0.84	0.82	0.92	0.99
	Median	0.50	0.66	0.83	0.75	0.75	0.77	0.82

growth, to a lesser extent, of the long-term liabilities, and to a greater extent, of the short-term liabilities. In 2014, the average share of total liabilities reached 147%, of which short-term liabilities were almost equal to the total assets of the enterprise (99%). The disastrous performance of these enterprises dragged along the average value of the largest enterprises in the sample, but certainly of the entire Serbian economy as well.

One of the important indicators of the quality of financial structure and long-term financial health is the net working capital (NWC), which is part of long-term sources of funding for the funding of working assets. Healthy enterprises have positive NWC or positive difference between the values of equity and long-term borrowed sources, on the one hand, and fixed assets, on the other hand. The total sum of NWC of all the enterprises in the sample was negative throughout the observation period and had a decreasing trend. When it comes to NWC at enterprise level, a third of the sample (around 64 enterprises) had negative NWC. The number of enterprises with negative NWC was relatively stable but it is obvious that their negative NWC was greater than the positive NWC of all other enterprises in the sample. This is, above all, attributed to the enterprises operating with losses over equity but certainly to a good portion of enterprises with positive equity as well. These enterprises fund part of their fixed assets through short-term loans and short-term spontaneous sources[7].

Unlike loans, spontaneous sources of financing are free of charge. Cash gap is used as an indicator of spontaneous sources of financing. It is obtained when the number of days of accounts payables outstanding is subtracted from the sum of the average number of days of inventory held and the number of days of average accounts receivables outstanding (i.e. "business cycle"). Cash gap is the period for which the enterprise has to provide additional sources for funding working assets. A reduction in cash deficit should lead to the reduction of indebtedness of the enterprise. However, reducing cash gap is not always a result of a more efficient management of working assets (for example, faster collection of receivables). On the contrary, it may be the result of prolonging the settlement of liabilities of the enterprise [13]. Table 4 shows the spontaneous sources of funding for the largest enterprises in Serbia.

At first glance, it appears that the average cash gap was and more than satisfactory. Based on low positive cash gap (of only a few days), it could be concluded that the enterprises were managing their working assets effectively with minimal additional funds for the settlement of liabilities to suppliers. However, the real situation was actually different. Therein lies the key trap of making conclusions solely on the basis of aggregate and average sizes. In this case, minimal positive cash gap was not the result of high efficiency, but the mass of prolonging the settlement of liabilities to suppliers.[8] In 2013, as many as half of the enterprises in the sample had a negative

Table 4: Cash gap [Author's calculation]

		2009	2010	2011	2012	2013	2014
1. No. days inventory held	Average	52	49	47	46	46	54
	Median	30	33	35	34	31	35
2. No. days accounts receivables outstanding	Average	75	72	73	70	74	74
	Median	59	55	55	55	56	54
3. No. days accounts payables outstanding	Average	124	123	115	113	117	110
	Median	81	82	84	82	82	75
Cash gap (1+2-3)	Average	3	(2)	5	3	3	18
	Median	10	12	14	11	4	13
Companies with negative cash gap	Number	68	75	75	73	84	74
	Share	40%	45%	45%	43%	50%	46%

Note: When calculating average values of the indicators, we have eliminated the extreme values that were thousands of times larger than the usual values of the parameters. Most often it was only one observation unit that deformed the average value of the indicator and distorts it significantly further away from the median.

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7   Short-term spontaneous sources include payables to suppliers for delivered raw materials, energy sources and services rendered with grace period (the so-called "trade credits"), liabilities for deferred payment of taxes and contributions, liabilities for employees, etc. [12, p. 191].

8   Low level of average cash gap is a result of offset of the length of a (long) business cycle and (long) accounts payables outstanding period.

cash gap. The financial burden of these enterprises was spilled over to their suppliers who finance working capital and liquidity of the enterprise. This type of financing is unsustainable in the long term and represents a clear sign of chronic insolvency of the Serbian economy [13].

Bearing in mind that the level of debt increased, a natural question arises: what was actually being funded to such excess? Borrowing as a result of investment activities which would give high yields in the long run would be justified and even desirable. However, the growth rates of the enterprises do not justify such a thesis. Sales growth was recorded only in 2010, after which there was a continuous decline. The average annual growth rate of sales revenues reached the negative zone in 2014 and amounted to -2%. The median growth rate of sales revenues was at zero level, which means half of the enterprises observed had positive sales growth and half of them had negative sales growth in 2014.

The same trend applies for the growth rate of the total assets of the largest enterprises. The average annual growth rate of total assets declined over the last four years. In 2014, the average and median growth rate of total assets amounted to 3%. The minimum growth and maximum indebtedness indicate that the largest enterprises in Serbia, on average, do not finance their growth, but survival. Compared to the period of the onset of the global crisis,

the number of enterprises that generate negative growth rates increased significantly which explains the pronounced downward trend in the business and investment activities at the level of the sample.

Profitability indicators and the effects of financial leverage

Relying on what we have previously learned and bearing in mind the macroeconomic indicators, it is possible to intuitively deduce a conclusion on the "profitability" of the largest enterprises in Serbia. For the purposes of measuring profitability, we used basic accounting indicators of profitability: common profit margins and the investment profitability indicators, such as return on total assets (ROA) and return on equity (ROE).

The largest number (about 77%) of the largest enterprises in Serbia operated with net profit in the period after the onset of the crisis. At first glance, this information seems encouraging. However, the number of the unprofitable enterprises increased significantly in 2014[9] (Figure 4).

Our economy is characterized by unacceptably low profit potential. The main reasons are, on the one hand, inefficiency and lack of profit margins, and insufficient returns on equity, on the other hand. The average

Figure 3: Sales growth rates and total assets growth rates of the largest enterprises in Serbia [Author]
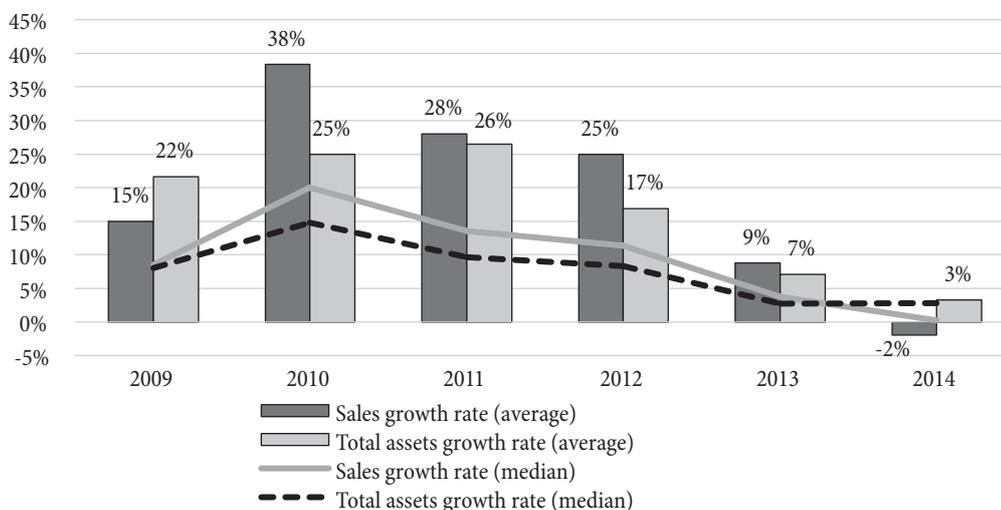
9   Given the fact that there are still no publicly available financial statements for 2014 for 6 of the observed enterprises, it is possible that the total number of unprofitable enterprises is even higher for that year.

Figure 4: The ratio of profitable and unprofitable enterprises [Author]
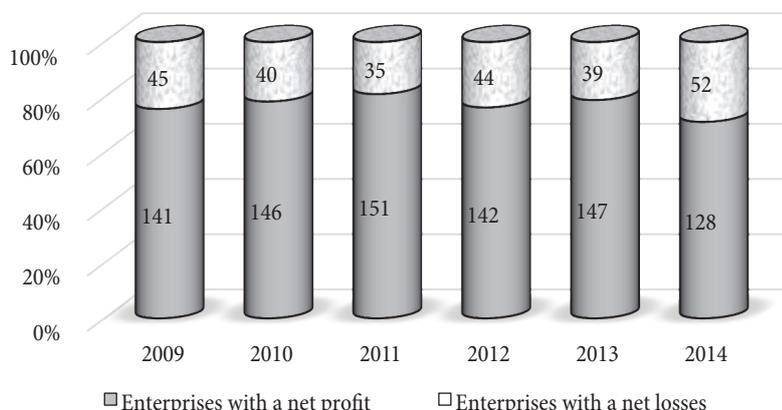
profitability of large enterprises and the entire economy was negative in the period of 2008-2013 with the exception of the year 2011.[10]

When it comes to the largest enterprises in Serbia, average profitability was slightly better and oscillated by a couple percent around zero. The average profitability was negative in the first and last year of observation period and marginally positive in the meantime. Profit margins are shown in Table 5.

The table shows three levels of margins in order to provide a deeper insight into the structure of net profit/loss. EBITDA is used as a rough approximation of cash flow from operating activities. EBITDA margin of the largest enterprises had its maximum value in 2010 (16%), followed by a gradual decline down to 10% in 2014. EBIT represents the concept of the profit that an enterprise makes before settling outstanding liabilities towards its funders and, finally, the state. EBIT margin had the same trend as the EBITDA margin, achieving a minimum value of 5% in 2014. When we consider that the cost of debt in Serbia is extremely high (double-digit interest rates), it is clear that profit margins are not sufficient to cover them. Finally,

the net profit margin shows how many dinars from sales revenues come into the possession of the owner. In the period after the outbreak of the crisis, average net profit margin ranged between ± 3%.

One of the key issues raised in this paper is how financial structure affects the profitability of the enterprise. The impact of borrowed sources on profitability, or returns on equity, is measured by the effects of financial leverage. Financial leverage has a two-way effect. Borrowing can cause both an increase and a decrease in profitability for the owners. In a situation where operating income is not sufficient to cover the fixed costs of debt, financial leverage has a negative effect due to the use of debt which reduces the yield for the owners. Opposite is true as well. Given that the interest expenses are fixed and are a known value, the direction and intensity of the impact of financial leverage is determined by the level of operating income. Volatility of cash flow is a key problem in assessing the effects of financial leverage.

The effects of financial leverage can be estimated by comparing ROA and ROE. On the one hand, ROA is free from the effects of financial structure, while ROE

Table 5: Profit margins of the largest enterprises in Serbia [Author's calculation]

		2009	2010	2011	2012	2013	2014
EBITDA margin	Average	0.13	0.16	0.14	0.13	0.10	0.10
	Median	0.09	0.10	0.10	0.10	0.09	0.08
EBIT margin	Average	0.07	0.10	0.09	0.08	0.06	0.05
	Median	0.07	0.07	0.07	0.07	0.05	0.05
Profit margin	Average	(0.02)	0.02	0.03	0.01	0.02	(0.03)
	Median	0.02	0.02	0.02	0.02	0.02	0.01

10 The positive result in 2011 was achieved due to the stable foreign exchange rate, or considerably lower negative exchange rate differences based on it. For further details see [14, pp. 334-336].

includes these effects. In the denominator ROA is EBIT[11], the concept of profit, which represents an approximation of the profit that the enterprise made when it was fully funded from its own resources. Theoretically, ROA and ROE would be the same for enterprises that are fully funded from equity. If ROE was above the level of ROA, then the utilisation of debt had a positive impact on the profitability of equity, and vice versa.

It is superfluous to discuss the effects of financial leverage on enterprises with negative equity, and in particular to present evidence given that there is no equity. Therefore, the analysis of the effects of financial leverage is focused on enterprises with positive equity.

In the period of 2009-2012, ROA was relatively stable at around 11%. After that, ROA declined, and was 8% in 2013 and 7% in 2014. On the other hand, ROE was more dynamic with strong negative trend. In the period from 2009 to 2013, the enterprises with positive equity had positive financial leverage because ROE was above the level of ROA. In 2009, average ROE was 22.5% while in 2013 it was 16%. However, in 2014, the largest enterprises in Serbia had negative financial leverage considering that the average ROE fell below the level of ROA and accounted for 4.5% only (Figure 5). Since average sales growth rate was negative in 2014, operating income was not sufficient to cover the high cost of debt.

From the perspective of the entire time horizon observed, the largest enterprises in Serbia (with positive equity) generated positive financial leverage. Six-year

average ROA of the observed enterprises amounted to 10%, while the six-year ROE was 16%. Although 77% of the enterprises from the entire sample operated with profit, about 50% of them experienced positive effects from financial leverage.

To get a more complete picture of profitability at the level of enterprises, Figure 6 shows the six-year average ROA and ROE of the observed enterprises. ROE dispersion around the average value is significantly higher than the ROA reflecting, primarily, the different financial structure of the enterprises. It is readily observed that the majority of enterprises were operating on the margins of profitability (concentrated around zero).

Bankruptcy risk indicators

Excessive borrowing is often the cause of financial problems and bankruptcy of the enterprises. However, there are enterprises with extremely high financial leverage that survive and achieve high rates of return, while enterprises with a prudent borrowing policy disappear. This means that there are a great number of factors that determine the success or failure of an enterprise. Credit worthiness of an enterprise used to be assessed only on the basis of basic financial indicators, such as liquidity ratios, profitability and solvency, which are observed separately. The extent to which a creditor would place importance on profitability or liquidity or solvency depends on his knowledge and personal preferences. This problem is particularly present

Figure 5: The effects of financial leverage of enterprises with positive equity [Author]

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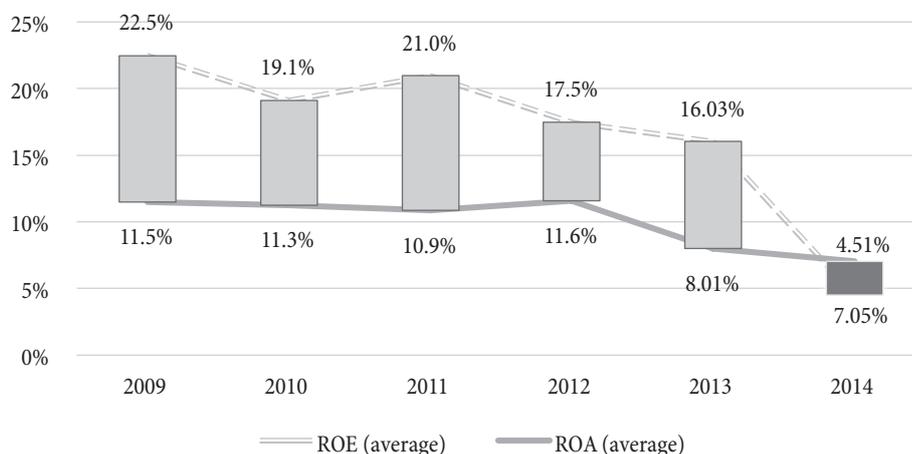
11 EBIT is obtained as a sum of net profit and interest rates expenses adjusted by tax savings. See more in [12, p. 142-144].

Figure 6: Six-year average ROE and ROA for enterprises with positive equity [Author]
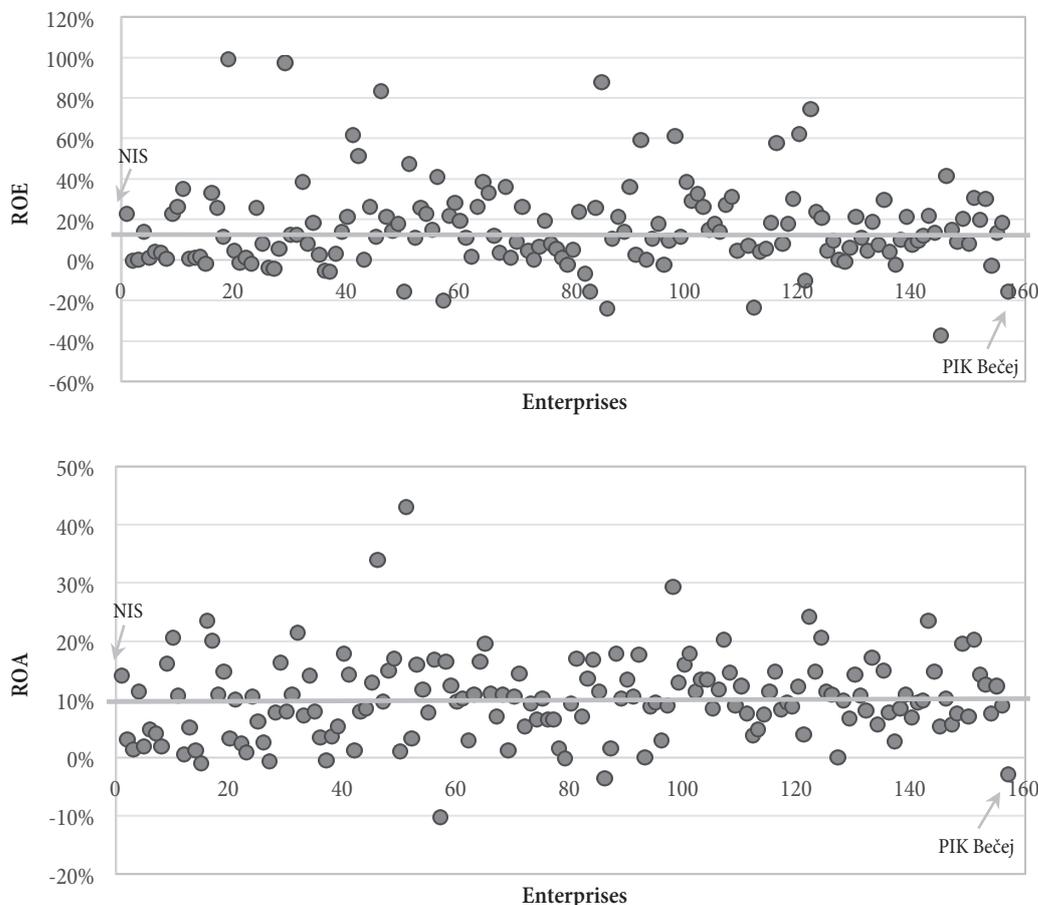
Note: The x ordinate shows enterprises with positive equity by size of operating revenues starting from the largest (number 1 – NIS) down to the smallest (number 157 – PIK Bečej). Horizontal line shows the average return for all enterprises.

in situations where these indicators are moving in the opposite direction, i.e. when, for example, indicators of profitability are increasing and those of liquidity are declining. In 1968, motivated by this problem, Edward Altman made the first model in which he integrated several indicators of financial health in the so-called "Z-core" [1].

It is a model that estimates the probability of bankruptcy of an enterprise based on multivariate analysis. It was based on a comparative analysis of two groups of enterprises: healthy enterprises and enterprises that went bankrupt. The result of the analysis is the coefficients of discrimination, which measure the intensity of the effects of certain financial indicators on credit risk. The original version of the Z-score was based on the data on open joint stock manufacturing companies from the developed market economies. Over time, the Z-Score was revised several times in order to expand the application and improve its accuracy. In this paper, we have used the EMS model

(Emerging Market Scoring Model), a variant of Z-results adapted to developing countries [2].

The EMS model is based on: 1) the financial analysis that is characteristic of universal (generic) models for risk measurement; and 2) the specific credit risks typical for developing countries (capital markets). It is appropriate for the analysis of manufacturing and service enterprises, as well as for various legal forms. The Z(EMS) score is obtained by the following formula:

Z(EMS)= 6.56 X1 +3.26 X2 +6.72 X3 +1.05X4 + 3.25

where: X1 = working capital/total assets; X2 = retained earnings/total assets; X3 = operating income/total assets; and X4 = book value of equity/total value of liabilities.

A distinction is made between three levels of Z-Score, and three safety zones for enterprises. On one side are enterprises with low risk of bankruptcy (safe zone), and on the other enterprises with high risk of bankruptcy (distress or red zone). Between these two extremes there is a buffer zone (grey zone) with a moderate level of risk of bankruptcy.

Figure 7: Z(EMS)-score of the largest enterprises in Serbia [Author]
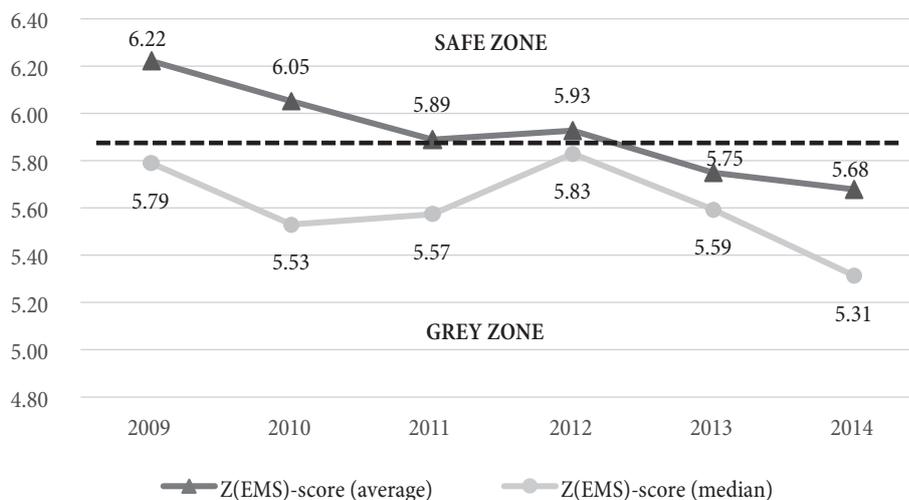
The average Z(EMS) score for the largest enterprises in Serbia in the period from 2009 to 2014 is shown in Figure 7. The average Z(EMS) score of the observed enterprises decreased from year to year, indicating the increase in risk of bankruptcy. In the year after the outbreak of the financial crisis, the average Z-Score stood at 6.22 while in 2014 it amounted to 5.68. In 2013, the average Z-Score was transferred from the safe to a grey zone with a downward trend in 2014. The negative trend of this indicator is the result of growth of indebtedness, the decline in business activity and the marginal profitability.

Based on Z(EMS) results, it is possible to determine an equivalent credit rating. The credit rating determined by credit rating agencies is the most complete and the most reliable indicator of credit risk. However, in the absence of such indicators, various approximations are used. Damodaran, for example, uses the interest coverage ratio as a rough approximation of credit rating [4, p. 73].

Enterprises with Z(EMS) score above 5.85 are in a safe zone, or in the comfort zone, given that the credit risk is at sufficiently low levels to provide security to creditors. Equivalent credit ratings for such enterprises range in the interval from AAA to BBB (investment grade ratings). Z(EMS) score lower than 4.15 is in the red zone, which indicates high probability of bankruptcy (equivalent to a credit rating in the range of B to D). The grey zone represents the intermediate zone, i.e. it is in the range from 4.15 to 5.85 (equivalent to credit ratings in the range from BBB to B). The criteria for determining credit rating based on

Z-Score and credit ratings for the observed enterprises are shown in Table 6.

Looking at changes in the relative relationship between the three safety zones, it is possible to notice a decline in the number of enterprises in the safe zone, which spilled over into the grey zone. The number of enterprises in the high-risk zone was the same in the first and last year of observation. However, the analysis of the relationships within each safety zone shows a trend of deterioration of credit quality. For example, although the number of enterprises in the red zone remained unchanged, the number of enterprises with a credit rating of D, which signals bankruptcy, had been increasing year by year, reaching a peak in 2014.

Credit rating assigned based on the value of Z(EMS) score could be further modified in order to improve its accuracy (the so called "modified credit rating") by including the following factors: 1) the vulnerability of the enterprise to currency depreciation; 2) the rating of the industry it belongs to; and 3) competitive position in the industry[12].

Conclusion

The financial structure of the largest enterprises Serbia in the period from 2008 to 2014 was characterized by: 1) excessive indebtedness; and 2) unfavourable maturity structure. Firstly, the largest enterprises in Serbia were

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12 For example, with enterprises that are leaders in their industry, the initially determined credit rating is raised by a level on the ranking scale. More on this and the EMS model in [2].

Table 6: The number of enterprises by Z(EMS)-score and credit rating [Author's calculation]

	Credit rating	Z(EMS) Criteria	2009	2010	2011	2012	2013	2014
SAFE ZONE	AAA	>8.15	43	38	37	33	37	36
	AA+	7.60 - 8.15	6	12	5	7	7	9
	AA	7.30 - 7.60	10	7	10	7	5	6
	AA-	7.00 - 7.30	4	6	10	16	10	3
	A+	6.85 - 7.00	7	2	2	1	2	3
	A	6.65 - 6.85	6	2	5	8	8	4
	A-	6.40 - 6.65	4	7	4	8	2	6
	BBB+	6.25 - 6.40	3	1	6	2	5	1
	BBB	5.85 -6,25	9	9	8	9	8	12
		Total	92	84	87	91	84	80
GREY ZONE	BBB-	5.65 - 5.85	2	6	4	5	7	4
	BB+	5.25 - 5.65	7	9	11	13	12	8
	BB	4.95 - 5.25	8	12	7	8	4	5
	BB-	4.75 - 4.95	4	4	8	5	5	8
	B+	4.50 - 4.75	6	9	8	8	10	7
	B	4.15 -4.50	10	11	13	10	13	11
		Total	37	51	51	49	51	43
DISTRESS ZONE	B-	3.75 - 4.15	8	9	9	5	7	11
	CCC+	3.20 - 3.75	15	12	4	11	9	8
	CCC	2.50 - 3.20	9	5	11	10	12	11
	CCC-	1.75 - 2.50	10	9	7	4	6	5
	D	<1.75	15	16	17	16	17	22
		Total	57	51	48	46	51	57

heavily indebted with the trend of continuous growth in the level of debt. In the year of outbreak of the global financial crisis, the average share of total liabilities to assets amounted to 62% while in 2014 it amounted to 69%. Most of the enterprises had the liabilities to assets ratio that varied between 60-80%. A huge problem posed the enterprises whose liabilities exceed the value of total assets (negative equity). In the period from 2008 to 2014, 29 enterprises from the sample had loss over equity at least in one year, usually in the more than three years. The level of indebtedness of these enterprises was rapidly increasing year after year, which dragged down the average of the sample and the entire Serbian economy.

Secondly, every year, financial structure gradually changed in favour of short-term funding sources. Since 2013, short-term sources exceed the overall long-term funding sources. In 2014, short-term liabilities accounted for 77% of total liabilities of the largest enterprises, which demonstrates immense pressure on their cash flow. Unfavourable maturity structure of funding sources may also be observed through NWC. Although a third of the

observed enterprises had negative NWC, the sum NWC for all the enterprises in the sample was negative throughout the observation period. It is, above all, attributed to the enterprises with losses over equity but certainly to a good portion of enterprises with positive equity as well.

The largest enterprises in Serbia were massively reliant on spontaneous sources of financing. In 2013, as many as half of the enterprises in the sample had a negative cash gap which means that the financing of working capital and liquidity spilled over to their suppliers. This type of financing is unsustainable in the long run.

What is most worrying is the serious decline in the level of business activity. The sales growth rate and total assets growth rate rose in 2010 followed by a continuous fall. In 2014, these rates had minimum values in the observed time horizon. The average growth rate of sales revenues was negative (-2%) for the first time, while the growth rate of total assets was only 3%.

The analysis of the effects of financial leverage was conducted on enterprises with positive equity since the effects of the enterprises with negative equity are more

than obvious. In the period from 2009 to 2013, the largest enterprises in Serbia had positive financial leverage, which was gradually reduced due to the decrease in profitability (of both ROE and ROA). In 2014, average ROE fell below the level of ROA indicating a negative financial leverage.

The high debt costs and the inability of funding through financial market hinder the solution to the problem of low liquidity of enterprises and financing growth. Expensive and restrictively available capital slows down cash flow in the supply chain thereby slowing turnover in the enterprise and increases investment in working capital. When the otherwise limited supply of capital is used to solve problems of inefficiency and lack of liquidity, space for capital investment completely diminishes. Such operation is untenable.

The high cost of capital, combined with other factors that reduce profitability of an enterprise leads to losses for an enterprise, which gradually erodes equity and pushes the enterprise towards the state of insolvency and bankruptcy. The use of EMS model pointed to an increase in the risk of bankruptcy as the average Z(EMS) score of the observed enterprises decreased from year to year. In 2013, average Z-Score transitioned from the safe to a grey zone, with a downward trend in 2014. The crisis has hit the most vital segment of the economy (enterprises with investment credit rating), which has been decreasing, while the high-risk enterprises (distress zone) are approaching the brink of bankruptcy. Therefore, based on the overall analysis, we can conclude that the most enterprises in Serbia are undercapitalized and at high risk of bankruptcy. Minimum growth and maximum debt in 2014 indicate that the largest enterprises in Serbia, on average, do not finance growth, but their survival.

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