DOI: 10.21005/oe2019.94.1.01

FOLIA POMERANAE UNIVERSITATIS TECHNOLOGIAE STETINENSIS
Folia Pomer. Univ. Technol. Stetin., Oeconomica 2019, 352(94)1, 5–16

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APPLICATION OF SELECTED MODIFIED FINANCIAL INDICATORS TO ASSESSING THE FINANCIAL STABILITY OF BUSINESS ENTITIES

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Summary. The main objective of the paper is to assess the financial stability of selected business entities using a choice of financial indicators and their modified versions. A review of the literature and the figures describing the research sample allowed for defining the proposed concepts and building selected financial formulae. The study showed that the financial stability assessment of these entities was not unequivocal, though, as there were substantial discrepancies between the values of the individual indicators. This was mainly caused by the seasonality of production or sales, which played a significant role considering the business profile of the food business operators examined. Still, however, the entities that demonstrated financial stability could be told from those that did not. The financially stable group comprised one company, while considerable financial difficulties – including the loss of stability – could be shown for two companies. The results of the study are presented in Figures. The paper is summarized with conclusions from the research.

Key words: financial stability, financial liquidity, debt.

INTRODUCTION

Maintaining financial stability in the enterprise is one of the functions pursued within the framework of conservative policy for financing its manufacturing and service activity. It is also the overall objective in enterprise management. The emergence of financial difficulties with regard to liquidity may generate insolvency and soon lead to irreversible disturbance of the enterprise's financial equilibrium, including bankruptcy. That is where the enterprise's operators have an important role to play as those responsible for ensuring that the business maintains its liquidity or an optimal level of short-and long-term debts. In such situations, considerable focus must be put on analyzing the current assets and their liquidity – including the soundness of maintaining stocks, the ability to collect receivables and cash management effectiveness. Importantly, current asset management is of crucial significance, as either excess or insufficient stocks of liquid current assets may have adverse effects on the functioning of the enterprise and generate additional costs. It should be remembered that maintaining appropriate liquidity affects the timely settling of liabilities, and it is the company's liabilities that any analysis of the its liquidity and level of debt will focus on.

The purpose of this study was to assess the financial stability of selected business entities by applying selected classical financial indicators, as well as their modifications developed as part of the research. Consequently, the research focused on verifying the usability of such

modifications rather than assessing these entities. Moreover, in the author's opinion the selected set of financial indicators turned out to be useful in making a quick and simple assessment of the financial stability of virtually any entity.

The study was based on a review of the literature and figures derived from the financial statements of the selected businesses.

MATERIAL AND METHODS

The solutions presented herein were part of the empirical study of enterprises listed on the Warsaw Stock Exchange (WSE) the main objects of activity of which were, according to the Polish Classification of Economic Activities (PKD), manufacture of food products and manufacture of beverages: Section C (Industrial Processing) groups 10 and 11, respectively. For the purposes of this paper, ten enterprises presenting the highest sales revenues at the end of H1 2019 were selected. Table 1 shows the names of the companies analyzed, their abbreviated names used throughout the paper, and their main objects of activity.

Table 1. The research sample

No.	Name	Abbriviated name used in the paper	Profile of business activity
1	Żywiec	ZWC	manufacture of beer
2	Kruszwica	KSW	oilseed processing and production of vegetable oils
3	Gobarto	GOB	slaughter, butchering and distribution of red meat – pork, beef and game meat
4	Astarta	AST	production and sale of sugar, sugar derivatives, production of milk and meat, production and sale of cereals, production of oilseed plants
5	Imcompany	IMC	growing of maize, wheat, sunflower, soybean and potatoes, storage and processing of crops, milk production
6	Indykpol	IND	raising and fattening of turkeys, as well as production and sale of turkey meat
7	Tarczyński	TAR	processing of pork and poultry and sale of produced meat and sausages
8	Kania	KAN	production of sausages and packed meats
9	Milkiland	MLK	production of dairy products
10	Pamapol	PMP	processing of meat and vegetables

Source: the author's own study based on: https://www.biznesradar.pl (access: 12.11.2019).

The temporal scope of the study covered the 4 years between 2015 and 2018, with an additional portion of data from the end of 2014 derived for the purposes of some of the calculations. The empirical research was performed based on quantitative methods, including indicator methods. The results are presented herein both descriptively and in the graphic form of figures.

FINANCIAL STABILITY OF BUSINESS ENTITITES

Papers on the issues of financial stability abound. The focus of their considerations is predominantly on financial system stability defined as a sound condition and harmonious cooperation of financial institutions, in the environment of safe and predictable operation

of money markets (Trichet 2000), or as a state of dynamic and sustainable equilibrium in mutually related financial markets (Solarz 2001). It is also a state where the financial system as a whole does not demonstrate any permanent loss of liquidity or insolvency (Crockett 1997) and indicates an absence of financial crises (Fidrmuc and Schardax 2000). According to the National Bank of Poland's (NBP's) definition, "stability of a financial system is a state where that system fulfills its functions in a permanent and effective manner, even when faced with large-scale unexpected and adverse disturbances of low probability" (Raport o stabilności systemu finansowego [*Report on financial system stability*]). The stability of a financial system, including segments of the banking, capital, insurance and currency systems, are mainly determined by the level of interest rates, the level of credit risk, the degree of the economic downturn risk resulting from the business activity of enterprises, and the degree of market risk in financial markets related to stock price fluctuations (Czerwińska 2015).

In the reviewed literature sources, financial stability is also considered in the context of local authorities (Filipiak 2016; Czarny 2018), where it marks the authority's ability to finance its tasks, provide public services on a permanent and effective basis and settle its liabilities (Jastrzębska 2017).

In the light of the foregoing definitions, the financial stability of an enterprise is a situation where the operational, investment and financial activity is carried out without disturbances, in a manner that is smooth and does not threaten other business entities.

The concept of financial stability is strictly related to such other concepts as:

a) solvency – ability to settle all liabilities,
b) liquidity – ability to smoothly settle current liabilities,
c) optimal level of debts – a level of indebtedness at which the enterprise maintains a good financial situation and a safe capital structure, with a low probability of a financial crisis developing,
d) creditworthiness – ability to timely settle debts and the costs of such debts, mainly in dealings with credit institutions.

The above-described concepts have a direct impact on the enterprise's security understood as such a configuration of resources and processes that ensures effective prevention of adverse events (Cabała 2012). Consequently, financial security encompasses resources in the form of the company's assets and its financial and human capital. The processes, for their part, are all the relationships found within the enterprise and the environment in which it operates, particularly the financial ones.

The level of the enterprise's financial stability is affected by many factors, among them:

a) exogenous factors, including the global economic situation, the country's economic situation, the economic situation in the industry within which the company operates, the intensity of demand for the goods and services offered for sale, legislative changes,
b) endogenous factors, such as the adopted policy for financing the company's activity, including the capital structure, the enterprise's ability to overcome unexpected and adverse events that threaten its continued operation, wrong decisions and errors in management.

ASSESSMENT OF THE FINANCIAL STABILITY OF THE ANALYZED COMPANIES USING MODIFICATIONS OF SELECTED FINANCIAL INDICATORS

For the purposes of this study, the financial stability of the companies surveyed herein was assessed using a small group of static indicators, namely current ratio, cash ratio and current liability ratio. The last of them is also referred to in the Polish literature as an indicator of the enterprise's indebtedness related to current liabilities (Siudek 2004). These indicators are constructed using net working capital components. Thereby, attention was here concentrated on making short-term assessments, as it was assumed that disturbances of financial stability caused by endogenous factors mainly begin with difficulties settling current liabilities. The aforementioned indicators were subsequently modified in order for them to adopt a dynamic nature, which is presented in Table 2. The literature does discuss modified formulae for calculating liquidity indicators (Analiza finansowa przedsiębiorstwa [*Financial analysis of the enterprise*] 2016), although a different approach to their construction was assumed in this study.

The base indicators were modified by adding turnover ratios for individual items. According to the assumptions found in the literature (Gajdka and Walińska 2000), the turnover ratios should be referred to at least two periods in order to average the values of the individual balance sheet items, e.g. inventories, receivables or short-term investments. For the modified indicators, average measurements were adopted that took into account static figures from two financial statement moments – start and end of the financial year. In order to rule out variations in the figures caused by, for instance, the seasonality of production or sales, further modifications of the indicators adopted average values taking into account static data at the end of each quarter of the given financial year. Moreover, the turnover ratios for the individual balance sheet items made a reference to the values of sales revenues[1]. The so-constructed financial indicators allowed for a more precise assessment of the financial stability of the enterprises surveyed herein than when using standard formulae, and – most importantly – represented a dynamic approach to studying the phenomena in question. The results are shown in Figures 1, 2 and 3.

Figure 1 shows that the measurements of the individual indicators differed significantly. Such differences were observed for all the companies studied, and were most distinct in the cases of Żywiec and Milkiland in 2015, Astarta and Imcompany in 2016, Pamapol in 2017 and Kruszwica across the entire temporal scope of the study. This was a result of large fluctuations in the net working capital components, which was only observable when considering their average values.

Assessing the current ratio on the basis of these values is not an easy task, as indicated by the example of Kruszwica in 2015. According to the classical indicator, the current ratio amounted to 4.29, which according to the literature should mean there was high excess liquidity in place (Nowak 2017). The current ratio calculated with account taken of the turnover ratios of the individual formula components in reference to the mean values at start of year and year-end was only slightly lower and amounted to 4.15, but it was far lower when the same formula structure was used with mean quarterly values, where it amounted to 1.98. Therefore, the effects of fluctuations in current assets, primarily inventories and current liabilities, on this value were substantial.

[1]The literature also discusses the possibility of including the cost of revenue in the days sales of inventory ratio (Bednarski 1994).

Table 2. Financial indicators adopted in the study

1. **WPG 1 – cash ratio**, values at year-end
$$\text{WPG } 1 = \frac{\text{G}}{\text{ZB}}$$ G – cash at year-end ZB – current liabilities at year-end
2. **ZWPG 2 – modified cash ratio**; sub-indicators counted as arithmetic average of the values at start of year and year-end
$$\text{ZWPG } 2 = \frac{\text{WCRGwD } 2}{\text{WCRZBwD } 2}$$ WCRGwD 2 – cash conversion cycle in days WCRZBwD 2 – days payable outstanding
3. **ZWPG 3 – modified cash ratio**; sub-indicators counted as arithmetic average of the values from the four quarters of the given year
$$\text{ZWPG } 3 = \frac{\text{WCRGwD } 3}{\text{WCRZBwD } 3}$$ WCRGwD 3 – cash conversion cycle in days WCRZBwD 3 – days payable outstanding
4. **WPB 1 – current ratio**, values at year-end
$$\text{WPB } 1 = \frac{\text{AO}}{\text{ZB}}$$ AO – current assets at year-end
5. **ZWPB 2 – modified current ratio**; sub-indicators counted as arithmetic average of the values at start of year and year-end
$$\text{ZWPB } 2 = \frac{(\text{WCRZwD2}) + (\text{WCRNKwD2}) + (\text{WCRIKwD2}) + (\text{WCRPAOwD2})}{\text{WCRZBwD2}}$$ WCRZwD 2 – days sales of inventory WCRNKwD 2 – receivables turnover ratio in days WCRIKwD 2 – short-term investment turnover in days WCRPAOwD 2 – other current asset turnover in days
6. **ZWPB 3 – modified current ratio**; sub-indicators counted as arithmetic average of the values from the four quarters of the given year
$$\text{ZWPB } 3 = \frac{(\text{WCRZwD3}) + (\text{WCRNKwD3}) + (\text{WCRIKwD3}) + (\text{WCRPAOwD3})}{\text{WCRZBwD3}}$$ WCRZwD 3 – days sales of inventory WCRNKwD 3 – receivables turnover ratio in days WCRIKwD 3 – short-term investment turnover in days WCRPAOwD 3 – other current asset turnover in days
7. **WZK 1 – current liability ratio**; values at year-end
$$\text{WZK } 1 = \frac{\text{ZB}}{\text{AT} + \text{AO}}$$ AT – aktywa trwałe
8. **ZWZK 2 – modified current liability ratio**; sub-indicators counted as arithmetic average of the values at start of year and year-end
$$\text{ZWZK } 2 = \frac{\text{WCRZBwD2}}{(\text{WRMTwD2}) + (\text{WCRZwD2}) + (\text{WCRNKwD2}) + (\text{WCRIKwD2}) + (\text{WCRPAOwD2})}$$ WCRMTwD 2 – fixed asset turnover in days
9. **ZWZK 3 – modified current liability ratio**; sub-indicators counted as arithmetic average of the values from the four quarters of the given year
$$\text{ZWZK } 3 = \frac{\text{WCRZBwD3}}{(\text{WRMTwD3}) + (\text{WCRZwD3}) + (\text{WCRNKwD3}) + (\text{WCRIKwD3}) + (\text{WCRPAOwD3})}$$ WCRMTwD 3 – fixed asset turnover in days

Source: the author's own study.

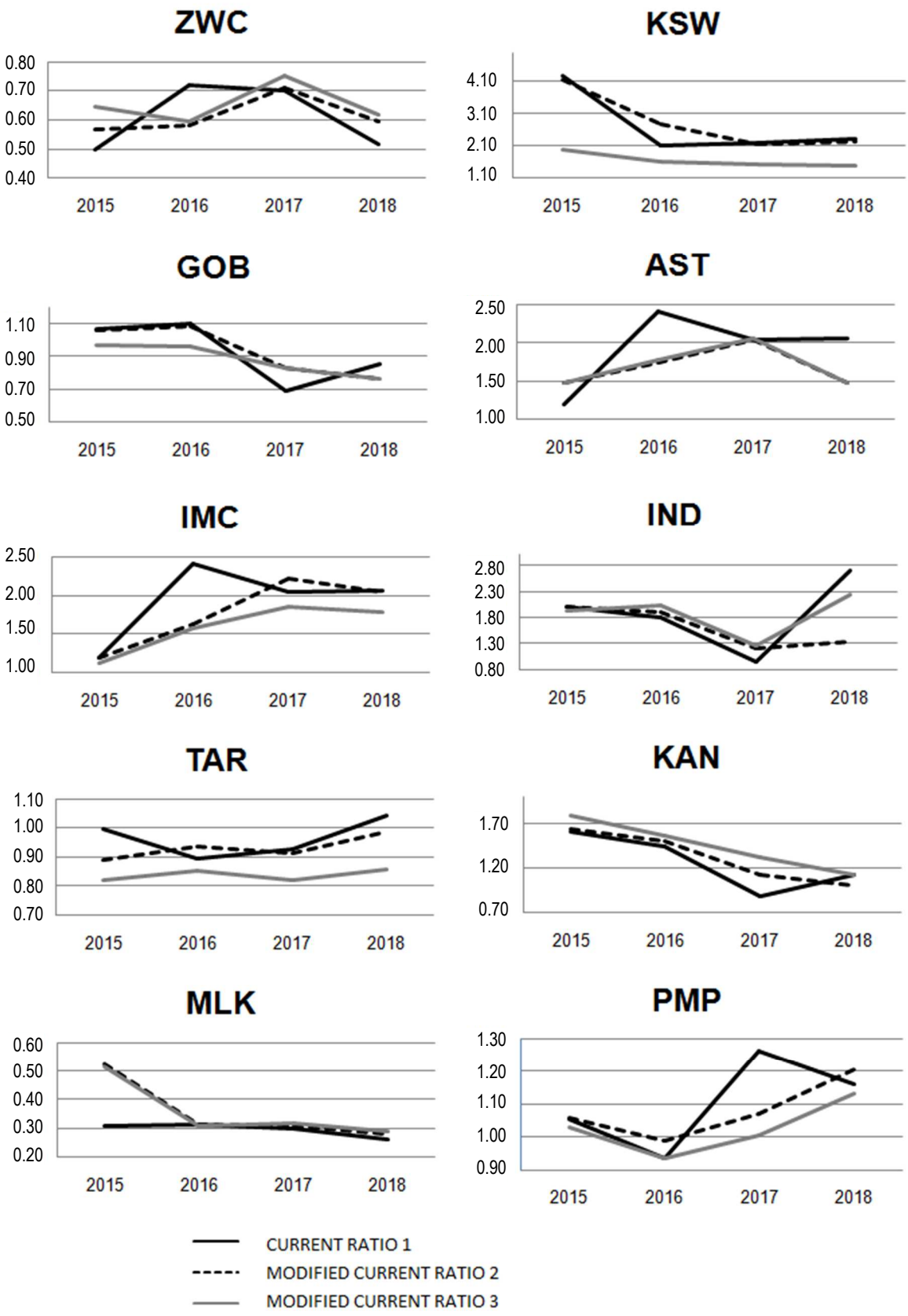

Fig. 1. Current ratio and its modifications
Source: the author's own study based on the financial data of the enterprises surveyed (https://www.biznesradar.pl/; access: 16.09.2019).

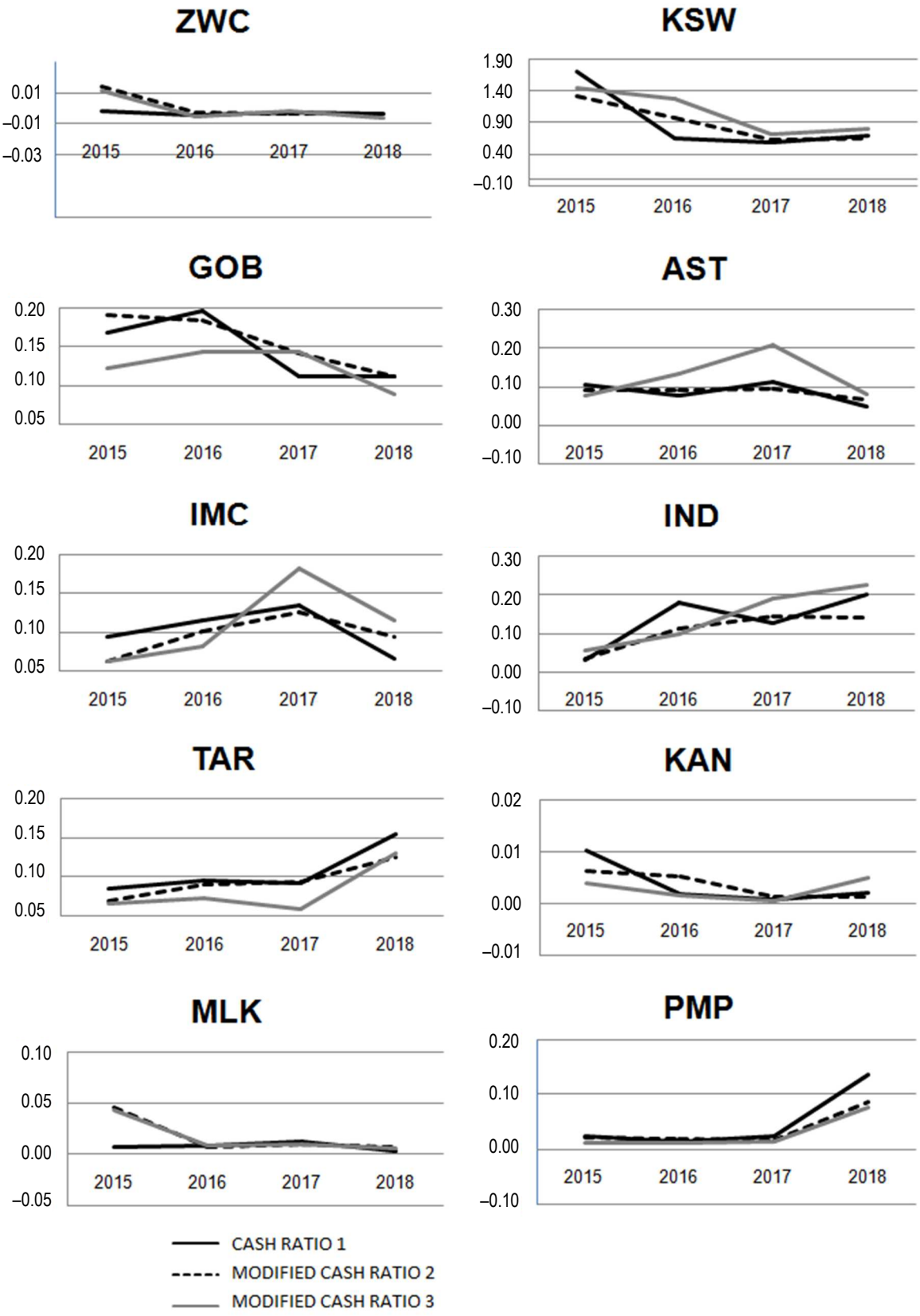

Fig. 2. Cash ratio and its modifications
Source: the author's own study based on same data as for Fig. 1.

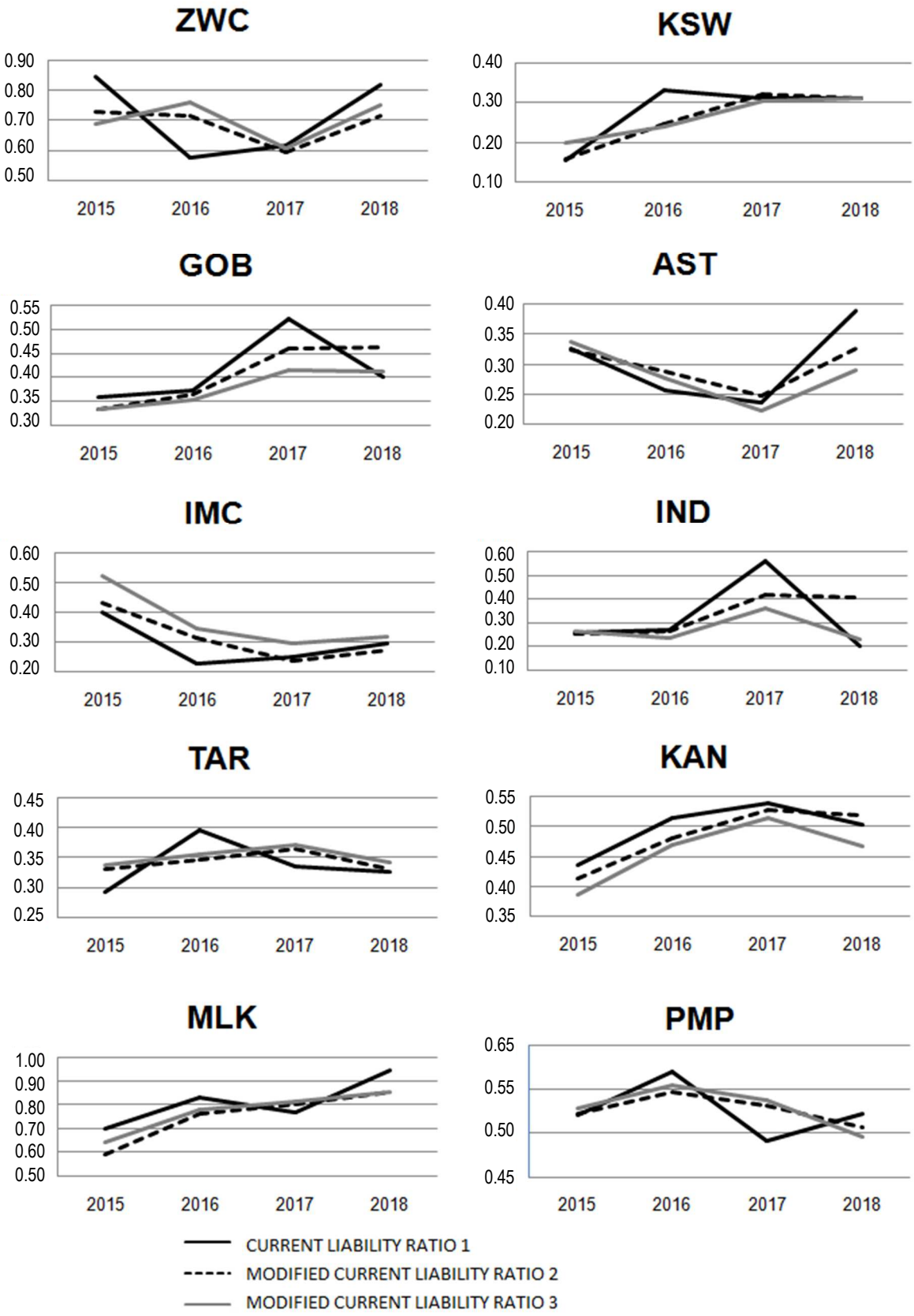

Fig. 3. Current liability ratio and its modifications
Source: the author's own study based on same data as for Fig. 1.

It can be concluded from the information contained in Fig. 1 that according to the classical liquidity indicators four of the enterprises demonstrated excess liquidity, i.e. their values exceeded 2.0. These were Indykpol in 2018, Imcompany and Astarta in 2016–2018 and the earlier-mentioned Kruszwica across the entire study period. However, according to the modified formulae taking quarterly measurements into account, slight excess liquidity was only observed for Indykpol in 2016 and 2018 and Astarta in 2017. In turn, Kruszwica's values of this indicator fit within the reference range of 1.5 to 2.0. Additionally, it should be noted that Milkiland and Żywiec did not reach current ratio values of more than 0.75, both when calculated using the classical and modified approaches.

The cash ratio and its modifications presented in Fig. 2 showed discrepancies, as well. Similarly to the earlier-discussed current ratio, this was the most distinct in the case of Kruszwica, particularly in 2016. At that time, the classically-calculated cash ratio was 0.64, which was above the universally-adopted threshold of 0.5. But the cash ratio calculated with account taken of the cash conversion cycle and the days payable outstanding ratio in reference to the mean quarterly values was much higher and amounted to as much as 1.27. This was caused by the far higher amounts of cash in Q1 and Q2 than in Q3 and Q4 of each year. Thus, the balance sheet showed year-end values that were approx. twice lower, which then resulted in the discrepancies between the indicator measurements.

For most of the enterprises analyzed herein the discrepancies were not as large, which mainly resulted from their obvious lack of cash ratio, which was close to 0. These were Żywiec, Kania and Milkiland across the entire temporal scope of the study, and Tarczyński and Pamapol in 2015–2017. The remaining companies that are not named above demonstrated a cash ratio close to the admissible value of 0.2. Moreover, their discrepancies between the values of the classical cash ratio and its modifications were insignificant.

In Figure 3, the discrepancies between the values of the individual indicators were much smaller. For most of the enterprises studied, the classical current liability ratio and its modifications presented identical or very similar levels, the companies being Astarta, Indykpol and Pamapol in 2015, Gobarto in 2015–2016, Żywiec in 2017, and Kruszwica and Tarczyński in 2018. Large discrepancies were observable for Żywiec in 2016, when the value of the classical indicator was 0.58, with that of the modified indicator taking into account quarterly measurements amounting to 0.76. In Indykpol in 2017, the situation was quite the opposite: the modified indicator had lower values, whereas the classical one rendered values larger by 0.2. This was caused by the value of the current liabilities at the end of 2017 being twice what they were in each of the first three quarters of the year.

Analyses of companies' current liability ratios require their critical value to be adopted. For the purposes of this study, the value was assumed as 0.5, which corresponded to half of the overall assets that could be financed by current liabilities. Consequently, the value of current liabilities corresponded to the value of the fixed capital of the enterprise. Thus, according to the classical approach six enterprises exceeded the threshold value. These were Gobarto and Indykpol in 2017, Pamapol in 2016, Kania in 2016–2017, and Milkiland and Żywiec across the entire temporal scope of the study. Additionally, the values of this indicator for the last two of the companies exceeded 0.8, in 2016 and 2018 for the former, and in 2015 and 2018 for the latter. As for the modified current liability ratio calculated using the quarterly values, Gobarto and Indykpol demonstrated values that were much below 0.5. However, Indykpol exceeded the threshold level slightly in 2015.

CONCLUSIONS

The indicators and their modification presented herein present an important tool in assessing the financial stability of enterprises, which was the objective of the study. Another objective was to focus on those indicators that in the author's opinion were the most important for the purposes of a quick and easy assessment using basic and readily-available figures.

Based on the observations and calculations made as part of the study, the following conclusions were drawn:

1. Using all the analyzed financial indicators, it was possible to tell entities that were financially stable from those that were not. Kruszwica turned out to present the highest degree of financial security. Its values measured for both the classical and modified indicators were desirable to an above-average degree. Safe values were achieved by most of the enterprises tested, namely Tarczyński, Indykpol, Imcompany, Astarta and Gobarto. The lowest financial security level – or even absence of financial stability – could be demonstrated for Milkiland and Żywiec, for which all the analyzed indicator values were unfavorable. After a more thorough financial data analysis it could be found that Milkiland was undergoing serious financial difficulties in the studied period, facing possible bankruptcy in the near future. However, the unfavorable situation of Żywiec might have been caused partly by the company's aggressive financing strategy.
2. No unequivocal assessment of the enterprises based on the classical indicators and their modifications was possible. Quite often, the values of the classical indicators differed significantly from those of their modified versions, especially the ones that took into account figures measured at the end of each quarter of the given financial year. Those indicator modifications that considered mean values for two reporting periods (start and end of year) mostly rendered results that were close to the values of the classical indicators or the modified quarterly indicators.
3. In the author's opinion, there is a strong rationale behind using the modified financial indicators. The main argument in favor of their application in analyzing the financial stability of business entities is that they help rule out the fluctuation of both selected balance sheet items and profit & loss items, as the modified indicators take into account sales revenues. Such fluctuations may be caused by the seasonality of production or sales, which is of significance considering the business profile the enterprises analyzed in the study. Consequently, the assessment method using the above-described range of indicators provides a realistic and dynamic picture of an enterprise's financial stability. This was clearly visible with the measurements of Kruszwica's current ratio. Its value of the classical indicator suggested substantial excess liquidity and, thus, an ineffective use of its current assets. However, the value of one of the modified versions of the indicator reached a desirable level indicating the company demonstrated appropriate asset management, maintaining very good financial liquidity at the same time.

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ZASTOSOWANIE MODYFIKACJI WYBRANYCH WSKAŹNIKÓW FINANSOWYCH DO OCENY STABILNOŚCI FINANSOWEJ PODMIOTÓW GOSPODARCZYCH

Streszczenie. Przewodnim celem opracowania była ocena stabilności finansowej badanych podmiotów gospodarczych przy zastosowaniu wybranych wskaźników finansowych i ich modyfikacji. Analiza literatury przedmiotu oraz danych liczbowych próby badawczej posłużyła do przybliżenia definicji zastosowanych pojęć oraz skonstruowania wybranych relacji finansowych. Jak wynika z badań, ocena stabilności finansowej badanych podmiotów nie była jednoznaczna, gdyż występowały rozpiętości między wartościami poszczególnych wskaźników. Spowodowane to było głównie sezonowością produkcji lub sprzedaży, co przy profilu działalności spółek z sektora spożywczego ma duże znaczenie. Możliwe było jednak wskazanie podmiotów mających stabilność finansową oraz jej nie mających. W grupie stabilnych finansowo była jedna spółka, natomiast w dwóch spółkach można było wskazać znaczne problemy finansowe, z utratą stabilności włącznie. Uzyskane wyniki badań przedstawiono na rysunkach. Na zakończenie opracowania sformułowano wnioski z przeprowadzonych badań.

Słowa kluczowe: stabilność finansowa, płynność finansowa, zadłużenie.