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Corporate financial stability and change of capital availability as a result of a loss event

Abstract

The main purpose of the study is to present the parameters of financial stability of a company, as well as to show the direction of their potential changes as a result of a loss event. The following thesis was adopted: "Financial stability of a company is a necessary condition for constant, undisturbed development, mainly by ensuring access to external capital in the case when it is necessary to cover the adverse effects of loss events".

This study aims at: defining financial stability, identifying financial stability parameters, indicating the potential changes of such parameters as a result of a loss event.

Keywords: financial stability, corporate capital, risk management, access to capital.
JEL Classification: G31, G17.

Introduction

Financial stability of a company is one of essential factors which determine the availability of necessary corporate capital (funds). The regular activity of a company

may be disrupted as a result of impact of various factors. A specific situation is the disruption of business activity of a company as a result of a loss event (fortuitous event). Loss events may lead to disruptions in particular areas of company activity, causing its financial instability. Restoration of the company activity to the initial state (prior to this event) requires capital injection, which should lead to improvement of a company's condition and restoration of financial stability.

The company capital demand may be varied, not only due to the extent of incurred losses, but also depending on the adopted risk management strategy. By adopting an active attitude, (i.e. applying transfer of risk to an insurance institution and/or raising reserves for covering losses with own resources − equity capital), a company will not demonstrate an increased demand for capital because it may use compensation or reserves to cover losses. However, in the situation when a company adopts passive attitude towards risk (i.e. does not secure financial resources for covering losses related to a fortuitous event), it will be forced to obtain external funding in order to restore smooth functioning. Unfortunately, as a result of a loss event, parameters illustrating financial stability in basic areas, such as financial liquidity, assets management efficiency (productivity), debt management (solvency) and profitability are disturbed, which may limit or even withhold the availability of external capital.

The main purpose of the study is to present the parameters of financial stability of a company, as well as to show the direction of their potential changes as a result of a loss event, taking into consideration their significance for ensuring access to external sources of capital necessary for covering the negative effects of an unforeseen event. The following thesis was adopted in the study: "Financial stability of a company is a necessary condition for constant, undisturbed development, mainly by ensuring access to external capital in the case when it is necessary to cover the adverse effects of loss events".

In connection with the adopted research assumptions, theoretical studies were conducted with the intention to solve the research problem that includes several elements: (1) definition of financial stability from the microeconomic perspective, (2) identification of company financial stability parameters, (3) indication of the potential changes of such parameters as a result of a loss event with regard to availability of external capital for covering the arising losses. Empirical justification of the presented thesis was based on the simulation analysis.

The study consists of six sections. The second section defines financial stability from the microeconomic perspective, indicating the basic parameters determining corporate financial stability. The third section presents the problem of corporate financial stability in respect of a change in capital demand as a result of a loss event. The variability of financial stability parameters with reference to covering the negative effects of a loss event is presented in the fourth section. The fifth

section contains the results of simulation analysis performed in order to indicate potential changes of parameters of corporate financial stability as a result of a loss event, taking into consideration their consequences for the availability of external capital. The conclusions of the conducted theoretical studies and empirical research is included in the sixth section.

1. Corporate financial stability and its defining parameters

The notion of financial stability appears in literature mainly in the macroeconomic context. It is regarded as a condition of proper functioning of the economic system of a country aiming at economic growth [Wojtyna 1995, p. 5]. This notion is considered mainly in the context of the financial system. A stable financial system maintains constant balance, and is resistant to crisis. There are multiple definitions of the financial system stability [more in: Crockett 2001; Allen, Wood 2006; Freedman, Goodlet 2007; Acharya, Richardson 2009], presented in Table 1.

Table 1. Selected examples of definitions of financial system stability

Definition of financial system stability	Author of the notion / Source
Financial stability is understood as an absence of financial crises	J. Fidrmuc, F. Schardax [2000, p. 29]
Financial stability is a condition where the financial system is able to withstand shocks without giving way to cumulative processes, which impair the allocation of savings to investment opportunities and the processing of payments in the economy	T. Padoa-Schioppa [2002, p. 20]
Financial stability is a condition of dynamic and constant balance in interrelated financial markets	J. K. Solarz [2008, p. 78]
Stable system is one which is able to perform its basic functions, i.e.: − effective and efficient allocation of economic resources from savers to investors, − proper pricing and efficient financial risk management, − smooth absorbing of real and financial shocks	G.J. Schinasi [2006, p. 2]
Financial stability is a condition of stability of financial institutions, financial infrastructure and financial markets. Financial stability is a condition where economic activity is not disrupted by fluctuations in the price of financial assets, or by problems of financial institutions to meet their contractual obligations	A. Crockett [1997, p. 2]
Stability means healthy situation and harmonious interaction between financial institutions combined with safe and predictable functioning of money markets	J.C. Trichet [2000, p. 195-200]

These are just selected examples of definitions of financial stability of a system, showing that this particular problem is considered in various aspects, which unfortunately makes research on stability from the microeconomic perspective

even harder. The above quoted definitions cannot be applied directly for describing financial stability of a company, because they refer directly to the financial sphere. However, using universal elements included in those definitions (such as: ability of a system to withstand shocks, ability of a system to perform its functions despite any changes, harmonious interaction between elements of a system), and recognising company as a system, we may propose a definition of a corporate financial stability. Additionally, taking into consideration the fact that, according to dictionaries, "stable" means reacting with appropriate changes of behaviour towards changes in the business environment, capable of returning to the equilibrium condition, neutralising any arising deviations and by way of redefinition, we may define corporate financial stability that highlights the features of a company which prove its stability.

Taking into consideration the quoted definitions and semantic capacity of the word "stable", it may be assumed that a financially stable company is one which operates in accordance with its goals despite disruptions. Such company is capable of resisting shocks on a permanent basis, at the same time maintaining its development path, as well as being able to perform its economic functions related to acquisition and allocation of capital in operating, investment and financial activities [Gorczyńska 2013, p. 105]. Therefore, a company demonstrates financial stability if, despite internal disruptions and changes in its environment, it is capable of maintaining financial liquidity, as well as debt management (solvency), assets management efficiency (productivity) and profitability within the limits determined by the outlined development strategy, which can be defined as a tolerance range. In the event of any deviations from the desired condition, such company is able to undertake activities which will restore the condition of smooth functioning (by acquiring and allocating the required resources). Therefore, determination whether a company is financially stable may be based on the analysis and evaluation of particular financial parameters referring to the following areas of financial stability: (1) financial liquidity, (2) debt management (solvency), (3) assets management efficiency (productivity), and (4) profitability. Following this logic, financial stability of a company may be presented as the function of: financial liquidity (L), debt management (D), efficiency (E) and profitability (P) according to the following formula (1):

$$SF = f(L,D,E,P) \tag{1}$$

Parameters of corporate financial stability are constructed on the basis of selected relations between both balance-sheet and profit & loss account elements. Table 2 contains selected financial ratios which determine the financial stability of a company (parameters of financial stability) in particular areas, taking into consideration the evaluation of their changes in respect of financial stability.

Table 2. Parameters of corporate financial stability according to evaluation areas

Area	Symbol	Role	Ratio (parameter)	Formula
Liquidity	L.1	S	Current ratio (static approach)	$\dfrac{\text{current assets}}{\text{current liabilities}}$
	L.2	S	Quick ratio (acid test) (static approach)	$\dfrac{\text{current assets} - \text{inventory}}{\text{current liabilities}}$
	L.3	S	Net working capital to total assets (static approach)	$\dfrac{(\text{current assets} - \text{current liabilities})}{\text{total assets}}$
	L.4	S	Cash productivity of assets (dynamic approach)	$\dfrac{\text{cash flow from operations}}{\text{total assets}}$
	L.5	S	General cash sufficiency (dynamic approach)	$\dfrac{\text{cash flow from operations}}{\text{investment outflow} + \text{financing outflow}}$
Debt management	D.1	D	Financial leverage (total debt to equity)	$\dfrac{\text{total debt}}{\text{equity capital}}$
	D.2	D	Total debt to assets	$\dfrac{\text{total debt}}{\text{total assets}}$
	D.3	S	Financial balance (long-term solvency based on fixed capital coverage)	$\dfrac{\text{equity capital} + \text{longterm debt}}{\text{fixed assets}}$
	D.4	S	Long-term debt coverage	$\dfrac{\text{tangible assets}}{\text{longterm debt}}$
	D.5	S	Times interest earned (interest coverage)	$\dfrac{\text{earnings before taxes (EBT)} + \text{interest payments}}{\text{interest payments}}$
Efficiency	E.1	S	Total assets turnover (productivity of assets)	$\dfrac{\text{sales}}{\text{total assets}}$
	E.2	S	Fixed assets turnover (productivity of fixed assets)	$\dfrac{\text{sales}}{\text{fixed assets}}$
	E.3	D	Receivables turnover (in days)	$\dfrac{\text{receivables} \times 365}{\text{sales}}$
	E.4	D	Inventory turnover (in days)	$\dfrac{\text{inventory} \times 365}{\text{sales}}$
	E.5	D	Efficiency ratio	$\dfrac{\text{cost of goods sold}}{\text{sales}}$
Profitability	P.1	S	Return on assets (ROA)	$\dfrac{\text{net profit (EAT)}}{\text{total assets}}$
	P.2	S	Return on equity (ROE)	$\dfrac{\text{net profit (EAT)}}{\text{equity capital}}$
	P.3	S	Return on sales (ROS)	$\dfrac{\text{net profit (EAT)}}{\text{sales}}$
	P.4	S	Operating profitability of assets (basic earnings power ratio)	$\dfrac{\text{operating profit (EBIT)}}{\text{assets}}$

Note:

S – stimulant – increase of ratio supports financial stability.

D – destimulant – increase of ratio has a negative impact on financial stability.

Source: Based on ratios presented in: [Gibson 2001; Helfert 2002; Fabozzi, Peterson 2003; Lewellen 2004; Błach 2010, Błach, Wieczorek-Kosmala 2012].

The first area refers to financial liquidity (L) and is evaluated on the basis of basic static (balance sheet data) parameters defining the possibility of covering current liabilities with current assets of various liquidity levels (L.1, L.2) and additionally by referring to the amount of net working capital securing the capacity to meet current liabilities (L.3). The increase in value of these ratios in time is favourable for financial stability. Evaluation of financial liquidity also takes a dynamic character (cash flow data) and becomes a stimulant of financial stability in the case of an increase of cash productivity (L.4) and cash sufficiency (L.5) ratios. Another area defined as debt management (D) includes parameters evaluating the financial risk taken by a company in two consistent aspects. The first of them refers to the level of company debt determined by the level of financial leverage (D.1) and by the total debt level (D.2). Decreases in value of these parameters have a positive impact on financial stability. The other aspect evaluates the ability of a company to service the existing debt (debt coverage ratios); an increase of these parameters (D.4, D.5) supports financial stability. The third group of ratios is intended to evaluate the area of company efficiency (E), assessing the ability of the company to generate sales revenue. An increase of total assets turnover (E.1) and fixed assets turnover (E.2) ratios has a positive influence on financial stability. On the other hand, an increase of the current assets turnover period (E.3 and E.4) has a negative impact on financial stability. Moreover, an increase of the cost ratio (E.5) will be negatively evaluated from the perspective of maintaining financial stability of a company. The last group of parameters assesses profitability (P) of activities undertaken by the company. An increase in time of the value of profitability ratios (P.1, P.2, P.3, P.4) enhances financial stability of a company.

If a company is able to maintain the proper direction of changes in the above-mentioned parameters defining financial stability, or is able to restore their values, it has the capacity to perform its basic functions, i.e. acquiring and allocating capital in accordance with the adopted development strategy and its main goals.

2. Corporate financial stability and changes in the capital demand as a result of a loss event

A fundament of corporate financial stability is the possibility to acquire and allocate capital, to achieve the goals of a company in accordance with the adopted development strategy. The principles of acquiring capital highlight the maturity of funds, as well as their value and cost together with specific determinants of the capital structure. Capital structure decisions should follow the optimal structure principle and dividend principle to minimise the costs of capital, or maximise the rate of return on equity at a particular cost. Other principles are related to the capital allocation. The capital allocation principles support the strive for optimisation of investment process and refer to fixed and working assets. Such decisions should

be focused on the efficiency of investment project, expressed through an increase of company profit, preceded by a proper increase of revenues and operating costs. The acquisition and allocation of company resources may be disrupted by the impact of various factors, both internal and external ones. A particular factor disrupting company operations, and therefore threatening its financial stability, is a loss event.

Loss (fortuitous) events which threaten company operations may have different reasons (independent of human activity − partly controlled by humans – resulting directly from human decisions and activities), various character (critical − acceptable; complex − single) and multiple effects (direct − indirect). From the perspective of financial stability, the analysis of effects of loss events is important in three aspects: security of a company (of its employees and assets), variability of its business environment (stability of delivery, capacity of sales market, loss of market reputation, decrease of market share) and expected financial results in the periods following the occurrence of a loss event (decreased sales revenue, limited operating profit, costs of restoring to the previous condition) [Grossi, Kunreuther, Patel 2005; Skipper, Kwon 2008; Dorfman Cather 2012]. The consequence of a loss event is that a company stops functioning in a normal manner as a result of the loss, at least for the period required to repair such losses. Restoration of a company to the initial condition (prior to a loss event) requires capital injection. On the other hand, the access to capital is subject to the corporate financial stability, which could be altered as a result of a loss event. Therefore, feedback takes place (compare Figure 1).

Figure 1. Feedback: loss event − financial stability − capital demand
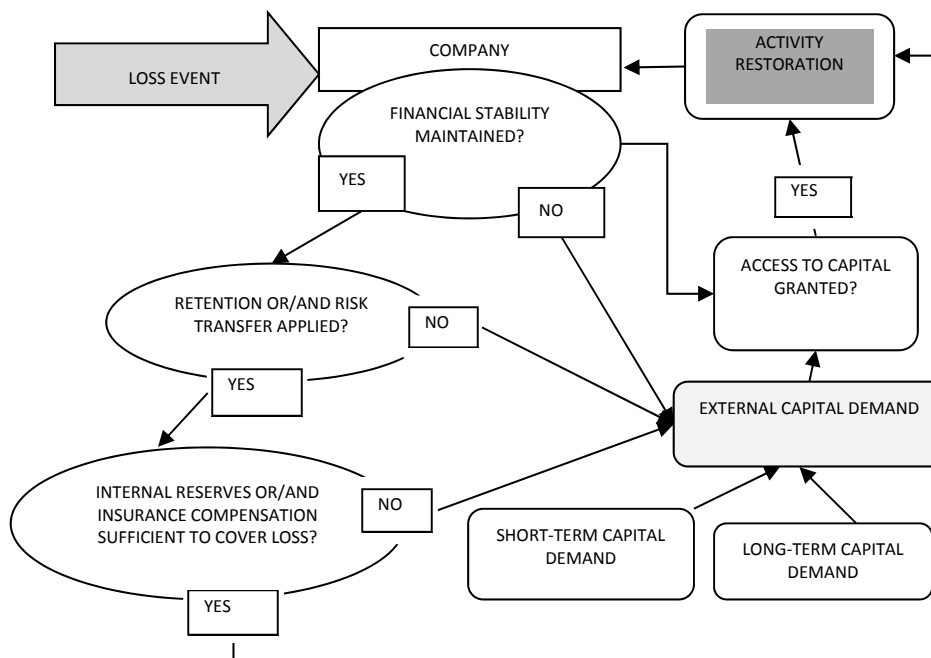
In the companies with active risk management, whether with the application of risk retention instruments (e.g. in the form of reserve raising)[1] or risk transfer instruments (e.g. insurance policy)[2], loss of financial stability is temporary and lasts until covering losses from the indicated resources (reserves, compensation). Therefore, there is a possibility of further functioning without requesting for additional capital from external sources, although it should be noted that the process of reconstruction of destroyed assets is most frequently a long-term process. Such company behaviours allow for maintaining financial stability, although on several occasions they also cause the necessity of acquiring funds for current operations (short-term capital), e.g. in the case of waiting for the payment of compensation, or in the event of an insufficient equity capital. Short-term capital for such companies becomes available on the condition that the external capital provider assesses positively the undertaken activities, despite unfavourable changes of selected parameters of financial stability in the short term. The situation is entirely different in financially stable companies which applied methods of risk management not fully covering the demand for reconstruction of activities, or which did not apply any method allowing for financing the arising losses. In such cases, capital demand includes both financing of current activity and obtaining funds for the recovery of assets, which most frequently results in the necessity of acquiring long-term capital. Financial stability of such a company evaluated in terms of parameters will be subject to unfavourable changes, both in the short- and long-term, which may result in limited access or total lack of access to funding sources (compare Figure 1)

To sum up, total capital demand of a company as a result of a loss event consists of: (1) the long-term (investment) capital demand − to replace the fixed assets, (2) the short-term (working) capital demand − to finance current activities during a period of reduced sales revenue and/or waiting for funds related to risk transfer (e.g. for payment of compensation). This dependence may be presented by the following formula (2):

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[1]   Risk retention is an instrument by means of which a company retains and covers all or part of loss resulting from the materialisation of a specific type of risk. Risk retention may constitute an independent risk management instrument, as well as an element of complex program combining transfer and risk retention instruments. The application of retention means that the effects of risk materialisation will be ultimately incurred by the company owners. More details about retention in: [Dickinson 2001; Vaughan, Vaughan 2003; Treby, Clark, Priest 2006].

[2]   Risk transfer instruments enable to transfer risk of a company to another entity, which agrees to accept additional risk in return for proper remuneration. A classic transfer of risk is based on an insurance agreement. However, it is possible to apply non-insurance risk transfer instruments, such as e.g. warranties or derivatives in hedging function. More about risk transfer in [Dickinson 2001; Vaughan, Vaughan 2003; Treby, Clark, Priest 2006; Banks 2008].

$$CD(E) = CDL + CDS \qquad\qquad (2)$$

where:

CD(E) – total capital demand of a company as a result of a loss event.

CDL   – long-term (investment) capital demand.

CDS   – short-term (working) capital demand.

The amount of capital demand of a company as a result of a loss event also results from a difference between the value of incurred (direct and indirect) losses and the amount of available resources secured by a company for covering such losses (in the form of reserve or/and in the form of insurance compensation). This dependence is presented by the following formula (3):

$$CD(E) = LD + LI - RR - CI \qquad\qquad (3)$$

where:

LD – direct losses incurred as a result of a loss event.

LI – indirect losses incurred as a result of a loss event.

RR – resources from internal reserve for covering risk effects.

CI – resources related to risk transfer (e.g. compensation).

Regardless of the amount of demand for capital from external sources, its availability depends on financial stability, which may be disrupted as a result of a loss event.

3. The variability of financial stability parameters in the context of loss coverage

Loss event belongs to the group of disruptions whose effects may be revealed directly or indirectly (delayed in relation to a moment of loss event) in the changes of financial stability parameters [Foster, Trout 1989; Rose, Lim 2002; Gaughan 2009]. Reduction of asset value (as a result of destruction of fixed or current assets) translates to the value of generated sales revenue, which has a direct impact on the results in the field of efficiency (productivity) and profitability of company operations. On the other hand, indirect effects of a loss event will have a negative impact on the direction of changes in parameters concerning debt management (solvency) and financial liquidity of a company.

Table 3 presents examples of effects of loss events and their impact on the change of financial stability parameters. A decrease of ratios falling within the group of stimulants (S), as well as an increase of ratios falling within the group of

destimulants (D) pose risks for maintaining financial stability in a company. Therefore, such changes in financial stability parameters will be negatively evaluated, also due to their potential consequences for the availability of external capital.

Table 3. Potential change in parameters of financial stability as a result of a loss event

| Category | Parameters/areas of financial stability | | | | | | | | | | | | | | | | | | |
| | Liquidity | | | | | Debt management | | | | | Efficiency | | | | | Profitability | | | |
	L.1	L.2	L.3	L.4	L.5	D.1	D.2	D.3	D.4	D.5	E.1	E.2	E.3	E.4	E.5	P.1	P.2	P.3	P.4
S.1	↔	↔	↑	↓	↓	↔	↑	↑	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
S.2	↓	↓	↑	↓	↓	↔	↑	↔	↔	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
S.3	↓	↓	↑	↓	↓	↔	↑	↔	↔	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
S.4	↕	↕	↕	↔	↑	↔	↔	↔	↓	↕	↔	↔	↔	↔	↔	↔	↔	↔	↔

Note:
Situations: S.1 (situation 1) – destruction/loss of fixed assets; S.2 (situation 2) – destruction/loss of current assets; S.3 (situation 3) – destruction/loss of fixed and current assets; S.4 (situation 4) – withholding investment activities (postponed or cancelled).
Symbols: ↓ − decrease in the value of ratio, ↑ − increase in the value of ratio, ↔ − no changes in the value of ratio, ↕ − potential changes in the value of ratio are ambiguous.

When analysing the impact of a loss event on the parameters of financial stability, the following conditions need to be taken into consideration. First of all, the evaluation should be performed as of a particular moment because the value of ratios may change over time. Additionally, in order to determine the direction of changes, it is necessary to establish the extent of loss, i.e. what part of assets has been lost. Thirdly, when performing the analysis, it shall be taken into consideration whether a company actively managed its risk, i.e. whether and in what manner a company planned to cover the effects of risk.

To generalise conclusions, a loss of entire or part of fixed or current assets has a negative impact on the change of financial stability parameters (situation 1, 2 and 3). In the case of withholding investment activities (situation 4) as a result of a loss event, unfavourable changes may be noticed only in parameters which determine company solvency (within debt management area). In addition, the situation of a financially stable company prior to a loss event becomes dependent on the methods of covering the arising losses. Therefore, Table 4 presents the impact of methods of covering losses on the change of financial stability parameters.

Table 4. Potential change in parameters of financial stability depending on the method of covering the effects of a loss event

Variants	Parameters/areas of financial stability																			
	Liquidity					Debt management					Efficiency					Profitability			
	L.1	L.2	L.3	L.4	L.5	D.1	D.2	D.3	D.4	D.5	E.1	E.2	E.3	E.4	E.5	P.1	P.2	P.3	P.4
V.1	↔	↔	↔	↔	↑	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
V.2	↔	↔	↔	↔	↑	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
V.3	↓	↓	↓	↓	↓	↔	↑	↑	↓	↓	↓	↓	↑	↑	↑	↓	↓	↓	↓

Note:
Variants: V.1 (variant 1**)** – covering loss: restoration of operating activity based on full insurance compensation; V.2 (variant 2) – covering loss: restoration of operating activity based on full insurance compensation and risk retention; V.3 (variant 3) – covering loss: fixed assets restoration, lack of active risk management programme (lack of insurance or/and internal reserves).
Symbols: ↓ − decrease in the value of ratio, ↑ − increase in the value of ratio, ↔ − no changes in the value of ratio, ↕ − potential changes in the value of ratio are ambiguous.

In the first two variants we assume the active risk management programme based on: risk transfer (variant 1) and combined risk transfer together with risk retention (variant 2). While variant 3 illustrates the situation of a company without active risk management programme. A company which may acquire resources for covering losses pursuant to a concluded agreement for risk transfer (e.g. insurance policy), or finance losses from internal reserves, will maintain the appropriate level and proper changes in parameters of financial stability (variant 1 and 2). On the other hand, parameters of financial stability of a company which did not manage risk will demonstrate an improper changes in the moment of a loss event, which will result in a lack of availability of funding sources necessary to cover the arising loss, and, in consequence, deterioration of financial stability of a company (variant 3). Therefore a company without active risk management programme is affected more severely by a loss event.

4. The variability of financial stability parameters as a result of a loss event − simulation analysis

In order to indicate potential changes in financial stability parameters as a result of a loss event, the simulation calculation method was applied [Ford et al. 1987; Wolmarans 2006]. Model company characterised by a specific level of financial stability was adopted as a baseline variant. The financial parameters characterising a model company were determined on the basis of aggregate statistical data collected by GUS (Central Statistical Office of Poland) in periodic reports

entitled "Financial Results of Economic Entities" [2013]. The companies classified in NACE as manufacturing entities, which represent 87% of industrial companies and 27% of the total number of entities covered by the report, were selected for the analysis. Based on the aggregate data collected for 15,056 companies (presented in Table 5), balance sheet items and income statement items which characterise the model company (typical for an manufacturing company) were calculated. The company represents the baseline variant, not taking into consideration the impact of the effects of a loss event (compare Table 6 and 7). The financial figures determined in this way enabled to calculate the parameters of financial stability for the base company, operating in an undisrupted manner (Table 8).

Thereafter, 3 simulation variants were applied for the simulation calculation, corresponding to three different levels of losses incurred by the company as a result of a loss event. The following assumptions corresponding to the requirements of the constructed model were adopted for the simulation calculation:

- Loss event solely caused the loss of a part of the company assets, including the loss of a part of tangible fixed assets, intangible fixed assets and inventory; for variant 1, the adopted loss was at the level of 10% of base values, for variant 2 − at the level of 50% of base values and for variant 3 − at the level of 90% of base values of indicated assets.

- As a result of decrease in assets involved in the manufacturing process (in operating activity), the sales revenue was reduced proportionally (by 10%, 50% and 90% of base value respectively, depending on the adopted simulation variant).

- The value of such assets and liabilities which are directly connected with the operating activity of the company were reduced proportionally to the reduced sales revenue. These include: accounts receivable, cash and accounts payable; the correction was performed adopting the amounts of efficiency (turnover ratio) determined for base values of accounts receivable, cash and accounts payable as constants.

- The level of cost of goods sold was also corrected, proportionally to the lowered sales revenue; this reduction was performed on the basis of base value of efficiency ratio presenting the relation of cost of goods sold to the sales revenue.

- It was assumed that a loss event would not have an impact on the level of other fixed assets, other current assets, long-term liabilities, as well as other liabilities and reserves; the value of such balance sheet items remains constant (at the base level) in each simulation variant.

- Also adopted as constants were the relations occurring in the baseline variant for the following categories: total revenue and sales revenue; total costs and cost of goods sold; earnings before taxes (EBT) and earnings after taxes (EAT); interest and long-term liabilities.

- Interest on liabilities was calculated on the basis of the following assumptions: the interest rate for long-term liabilities was 10%; the short-term liabilities were not charged with interest.
- Due to limited data availability, earnings before interest and taxes (EBIT) was determined according to the simplified formula: earnings before taxes (EBT) + interest.
- It was assumed that loss incurred as a result of a fortuitous event would be covered by retained earnings first, and in case they were insufficient, the share capital of the company would be applied.
- The value of lost fixed and current assets was taken into consideration in the following item of the profit and loss account: extraordinary losses.
- Other short-term liabilities constitute the parameter finalising the model.

Simulation of financial data for particular variants (variant 1, 2, 3) concerns the period t = 1 when the loss event occurred. It is estimated that payment of the compensation (if the company had an property insurance), obtaining funding sources in order to restore the lost property, as well as the very purchase of assets allowing to restore the level of activity from the period preceding the fortuitous event (t = 0) will not take place until the following period (t = 2), not included in the simulation calculation.

Table 5. Initial data: aggregated financial data of manufacturing companies in Poland in 2013

Assets	PLN M	Equity capital & liabilities	PLN M	Profit & Loss Account items	PLN M
Fixed assets	406 139.1	**Equity capital**	391 668.0	Total revenues	1 081 649.3
Plant & equipment (tangible assets)	290 253.2	Share capital (initial capital)	137 449.0	Sales	1 056 411.6
Intangible assets	19 835.8	Retained earnings	254 219.0	Total costs	1 030 898.6
Other fixed assets	96 050.1	**Liabilities & reserves for liabilities**	365 539.5	Cost of goods sold	1 004 038.1
Current assets	351 068.4	Long-term liabilities	86 441.0	Loss (extraordinary)	0
Inventory	116 945.4	Short-term liabilities in this:	235 547.8	EBT (earnings before taxes)	50 766.7
Accounts receivable	158 483.0	− other short-term liabilities,	112 665.3	EAT (earnings after taxes)	44 184.1
Cash	53 091.7	− accounts payable	122 882.5		
Other current assets	22 548.3	Other liabilities and reserves	43 550.7		
Total assets	757 207.5	**Total sources of funds**	757 207.5		

Source: Based on: [GUS 2013].

As a result of the performed simulation, changes of the most important categories illustrating the financial situation of the company in consequence of a loss event were noticed (Table 6 and 7).

Table 6. Simulation analysis: Change of the balance sheet situation of the model company

Data (in PLN)	Basic Variant	Variant 1	Variant 2	Variant 3
Fixed assets	26 975 232.47	24 915 661.53	16 677 377.79	8 439 094.05
Plant & equipment (tangible assets)	19 278 241.23	17 350 417.11	9 639 120.62	1 927 824.12
Intangible assets	1 317 468.12	1 185 721.31	658 734.06	131 746.81
Other fixed assets	6 379 523.11	6 379 523.11	6 379 523.11	6 379 523.11
Current assets	23 317 507.97	21 135 520.06	12 407 568.41	3 679 616.76
Inventory	7 767 361.85	6 990 625.66	3 883 680.92	776 736.18
Accounts receivable	10 526 235.39	9 473 611.85	5 263 117.69	1 052 623.54
Cash	3 526 281.88	3 173 653.69	1 763 140.94	352 628.19
Other current assets	1 497 628.85	1 497 628.85	1 497 628.85	1 497 628.85
Total assets	50 292 740.44	46 051 181.59	29 084 946.20	12 118 710.81
Equity capital	26 014 080.77	23 177 773.65	11 832 545.16	487 316.68
Share capital (Initial capital)	9 129 184.38	9 129 184.38	9 129 184.38	9 129 184.38
Retained earnings	16 884 896.39	14 048 589.27	2 703 360.79	−8 641 867.69
Liabilities and reserves for liabilities	24 278 659.67	22 873 407.94	17 252 401.04	11 631 394.13
Long-term liabilities	5 741 299.15	5 741 299.15	5 741 299.15	5 741 299.15
Short-term liabilities (in this):	15 644 779.49	14 239 527.76	8 618 520.86	2 997 513.95
− other short-term liabilities	7 483 083.16	6 894 001.06	4 537 672.69	2 181 344.31
− accounts payable	8 161 696.33	7 345 526.70	4 080 848.17	816 169.63
Other liabilities and reserves for liabilities	2 892 581.03	2 892 581.03	2 892 581.03	2 892 581.03
Total sources of funds	50 292 740.44	46 051 181.59	29 084 946.20	12 118 710.81

Table 7. Simulation analysis: change of selected items of profit & loss account of the model company

Data (in PLN)	Basic Variant	Variant 1	Variant 2	Variant 3
Total revenues	71 841 744.16	64 825 195.27	36 758 999.73	8 692 804.20
Sales	70 165 488.84	63 148 939.96	35 082 744.42	7 016 548.88
Total costs	68 470 948.46	61 802 257.57	35 127 494.02	8 452 730.47
Cost of goods sold	66 686 908.87	60 018 217.99	33 343 454.44	6 668 690.89
Loss (extraordinary)	0	2 836 307.12	14 181 535.60	25 526 764.08
EBT (earnings before taxes)	3 371 858.40	186 630.58	−12 550 029.89	−25 286 690.36
EAT (earnings after taxes)	2 934 650.64	162 431.36	−12 550 029.89	−25 286 690.36
Interest	574 129.91	574 129.91	574 129.91	574 129.91
EBIT (operating profit = = EBT+ interest)	3 945 988.31	760 760.49	−11 975 899.97	−24 712 560.44

Variant 1: Change of financial situation of the company (most important remarks):

- Loss of 10% of tangible assets, intangible assets and inventory.
- Total value of loss as a result of a fortuitous event amounted to PLN 2.8 million.
- The loss was covered by the internal reserve in the form of retained earnings, due to which decrease in the value of equity capital by PLN 2.8 million was reported (decrease of retained earnings by 17%, while the initial capital remained unchanged).

- The total balance sheet sum of the company was reduced by PLN 4.2 million (which constitutes 8% of base value), and the net earnings (EAT) decreased by PLN 2.7 million (which corresponds to 94% of base value);

Variant 2: Change of financial situation of the company (most important remarks):

- Loss of 50% of tangible assets, intangible assets and inventory.
- Total value of loss as a result of a fortuitous event amounted to PLN 14.2 million.
- The loss was covered by the internal reserve in the form of retained earnings, due to which decrease in the value of equity capital by PLN 14.2 million was reported (decrease of retained earnings by 94%, while the initial capital remained unchanged).
- The total balance sheet sum of the company was reduced by PLN 21.2 million (which constitutes 42% of the base value), and the net earnings (EAT) decreased by PLN 15.5 million and reached a negative value;

Variant 3: Change of financial situation of the company (most important remarks):

- Loss of 90% of tangible assets, intangible assets and inventory.
- Total value of loss as a result of a fortuitous event amounted to PLN 25.5 million.
- The loss was covered by the internal reserve in the form of retained earnings, due to which decrease in the value of equity capital by PLN 25.5 million was reported (the loss absorbed the entire internal reserve in the form of retained earnings, and the initial capital was also affected); the value of equity capital was overall reduced by 98% as compared to the baseline variant.
- The total value of assets of the company was reduced by PLN 38.2 million (decrease by 76% of the base value), and the net earnings (EAT) decreased by PLN 28.2 million and reached a negative value.

Return to the initial condition (i.e. prior to the loss event) requires incurring appropriate expenditure for the renewal of lost fixed and current assets. In such case, it becomes necessary to acquire funds supplementing equity and debt capital. The access to external funds depends on the financial stability of a company, which can be evaluated on the basis of selected parameters (Table 8)[3].

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[3] Parameters L.4 and L.5 were excluded from the analysis, as there were no available cash flow data. Consequently, changes in the level of financial liquidity were observed based on the static parameters (balance sheet ratios): L.1, L.2 and L.3.

Table 8. Simulation analysis: change in parameters of financial stability
of the model company

Parameter	Basic Variant	Variant 1		Variant 2		Variant 3	
		Parameters of financial liquidity					
L.1	1.49	1.48	↓	1.44	↓	1.23	↓
L.2	0.99	0.99	↔	0.99	↔	0.97	↓
L.3	0.15	0.15	↔	0.13	↓	0.06	↓
		Parameters of debt management					
D.1	0.93	0.99	↑	1.46	↑	23.87	↑
D.2	0.48	0.50	↑	0.59	↑	0.96	↑
D.3	1.18	1.16	↓	1.05	↓	0.74	↓
D.4	3.36	3.02	↓	1.68	↓	0.34	↓
D.5	6.87	1.33	↓	−20.86	↓	−43.04	↓
		Parameters of efficiency					
E.1	1.40	1.37	↓	1.21	↓	0.58	↓
E.2	2.60	2.53	↓	2.10	↓	0.83	↓
E.3	54.76	54.76	↔	54.76	↔	54.76	↔
E.4	40.41	40.41	↔	40.41	↔	40.41	↔
E.5	0.95	0.95	↔	0.95	↔	0.95	↔
		Parameters of profitability					
P.1	5.84%	0.35%	↓	−43.15%	↓	−208.66%	↓
P.2	11.28%	0.70%	↓	−106.06%	↓	−5188.96%	↓
P.3	4.08%	0.25%	↓	−34.14%	↓	−290.89%	↓
P.4	7.85%	1.65%	↓	−41.18%	↓	−203.92%	↓

On the basis of simulation of balance sheet and profit & loss account data, the value of selected parameters of financial stability was calculated, indicating possible differences in the financial situation of the company, depending on the level of incurred losses. The change in the financial stability parameters was evaluated by referring to the values determined for the baseline variant.
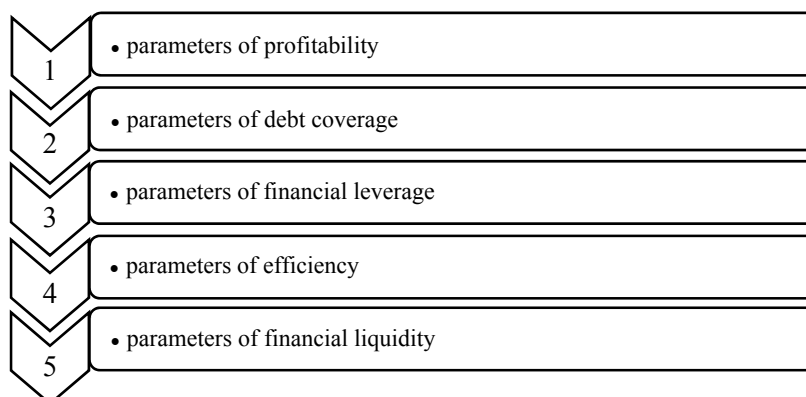
The following changes of financial stability parameters were noticed for variant 1: No changes were noticed in the field of financial liquidity evaluation, which could indicate higher risk or loss of financial stability. A small increase of debt management ratios, amounting to a few per cent, was noticed in the field of financial leverage (informing about increasing debt level). At the same time, a significant decrease of the capacity of the company to service debt was reported − ratio D.4 was reduced by 10%, however, ratio D.5 illustrating the capacity of the company to cover interest from operating profit (EBIT) was reduced by as much as 81%. In the field of efficiency, a small decrease of total assets and fixed assets turnover ratios was reported (E.1 and E.2). Other efficiency ratios, in accordance with the assumptions adopted for the model, are constant for all simulation variants. The largest decrease, signalling significant deterioration of the financial situation of the company, and therefore financial instability, was reported in the field of profitability. All profitability ratios were reduced by 80%-90%.

The following changes of financial stability parameters were noticed for variant 2: Deterioration of ratios informing about the decrease of financial liquidity

was noticed. However, a reduced level of liquidity ratios may be considered to be acceptable. In the field of debt management, a significant increase of leverage ratios was noticed (ratio D.1 increased by 56%, whereas ratio D.2 increased by 23%). However, the achieved level of debt ratios may be acceptable and not demonstrating an excessively high level of financial risk (moderate level of bankruptcy risk). Debt service ratios were significantly reduced, informing about deterioration of the condition of the company in this area. In consequence of achieving a negative operating result (EBIT), the situation of the company with regard to capacity to cover interest should be regarded as particularly difficult. Within the area of efficiency, a decrease in total assets and fixed assets turnover ratios amounting to several per cent was reported, which indicates reduction of the company productivity. Other efficiency ratios, in accordance with the assumptions adopted for the model, are constant for all simulation variants. Unfavourable changes were noticed in the field of profitability, due to the fact that significant extraordinary loss were translated to negative financial results (EAT and EBT).

The following changes of financial stability parameters were noticed for variant 3: Significant deterioration of all financial liquidity ratios. The newly determined level of ratios shall be regarded as the limit value, indicating an increased risk of financial liquidity. In the field of debt management, a rapid increase of leverage ratios up to the levels demonstrating a significant degree of financial risk was noticed (high bankruptcy risk). The interest coverage ratio (D.5) achieved a value below zero, due to the negative financial result (EBIT) of the company. In the field of efficiency, a significant decrease in total assets and fixed assets turnover ratios (decrease by 58% and by 67%, respectively) was reported, which indicates significant deterioration of the company efficiency. Other efficiency ratios, in accordance with the assumptions adopted for the model, are constant for all simulation variants. Similarly as in variant 2, the worst results were reported in the area of profitability − settlement of lost property through the category of extraordinary loss translated to the negative financial result of the company, and therefore also to the negative profitability ratios.

Figure 2. Order of impact of the effects of a loss event on the parameters
of corporate financial stability

1	• parameters of profitability
2	• parameters of debt coverage
3	• parameters of financial leverage
4	• parameters of efficiency
5	• parameters of financial liquidity

The following conclusions may be indicated on the basis of the performed simulation analysis. The extent of changes in the financial situation of a company, and therefore a potential change of financial stability parameters depends on the extent of loss incurred as a result of a fortuitous event.

With small extent of loss (variant 1), significant deterioration of parameters in the area of profitability, as well as capacity to service the debt, were noticed (ratios based on P&L categories). Variant 1 indicates the maintenance of financial stability even in the case a loss event. Lower values of financial stability parameters do not seem to lead to any difficulties with access to external sources of funds (mainly debt capital).

With moderate level of losses (variant 2), the following were reported: deterioration of profitability ratios, decrease in the ratios of capacity to service debt and efficiency, increase in the level of debt. With high level of losses (variant 3), deterioration of parameters in all areas of financial stability assessment was reported, in the order indicated in variants 1 and 2; the smallest (however, still noticeable) changes were reported in the field of financial liquidity. Variant 2 and variant 3 show significant deterioration of financial situation of the company, leading to financial instability, which in turn may constitute a serious obstacle in the case of searching for external sources of funds (especially debt capital). In particular variant 3, where deterioration of all parameters of financial stability was noticed, indicated potential difficulties of the company which would be forced to look for external funding sources as a result of a loss event.

The described variability of parameters of financial stability shows that, taking into consideration the model assumptions, the profitability area seems to be most sensitive to the effects of loss event (through profit & loss account categories

and settlement of extraordinary losses). Risk to financial stability is subsequently transferred to the capital structure of the company (level of debt) and its ability to service the debt (as a result of using equity for covering the loss). Lastly, the effects of a loss event have an impact on the level of financial liquidity of the company (compare Figure 2).

Conclusions

The main purpose of the study was to present parameters of financial stability of a company, as well as to show the direction of their potential changes as a result of a loss event, taking into consideration their significance for ensuring access to capital required for covering the effects of a loss event.

As a result of the conducted research, it was determined that the occurrence of loss event, the effects of which, e.g. destruction of assets, may cause temporary suspension or significant disruptions of the activity of a company and have an impact on the corporate financial stability. During the analysis of the change of financial stability parameters (in the areas of profitability, debt management, efficiency and liquidity), deterioration of the financial situation of a company can be noticed. Due to this, financial stability of a company does not guarantee its maintenance in the event of a loss event, if a company had not secured resources for covering the effects of this event (e.g. in the form of equity capital or insurance) because the availability of external funds is limited as a result of the poor financial condition of a company (higher risk for capital providers based on the analysis of the financial stability parameters). If the parameters of financial stability are changed beyond the limits determined by the company development strategy, and at the same time such a company is not able to restore their proper value (e.g. by covering losses), such company becomes financially unstable.

Therefore, it shall be stated that financial stability of a company is not the only (necessary) factor that determines the condition for constant, undisturbed development by ensuring access to capital allowing for covering negative effects of loss events. Based on the conducted theoretical studies and empirical test it shall be noticed that financial stability of a company is, among other things, subject to the application of active approach to risk management, and a failure to undertake such activities may cause irreversible effects for financial stability of a company, resulting in the condition of permanent instability. While these conclusions are accepted, the function describing financial stability (formula 1.1) should be extended by the parameter related to the problem of risk management (RM), according to the following proposal (4):

$$SF = f(L,D,E,P,RM) \qquad (4)$$

Order and significance of particular parameters describing the function of financial stability may become the area for further scientific research. Therefore, financial stability described in this way becomes another argument for adopting an integrated approach to finance and risk management in a company.

Acknowledgements

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