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Knowledge of the financial management practices of listed SMEs

Abstract

RESEARCH OBJECTIVE: Small and medium-sized businesses are constantly driving economic prosperity. The SME sector accounts for the overwhelming majority of enterprises, i.e., 99.8%, both in Poland and in the EU as a whole. The aim of the paper is to clarify the importance of the key role of knowledge management (KM) in the financial management of small and medium-sized listed companies, especially in terms of investment decisions.

THE RESEARCH PROBLEM AND METHODS: The research method used in this article will be the analysis of stock market data describing the not very satisfying financial conditions of small and medium-sized listed companies in times of broad economic crises, which mainly include the pandemic period and the military conflict in Ukraine. On the basis of selected financial data, an econometric model was created to help explain the mechanism of changes occurring in the financial conditions of the listed business entities.

THE PROCESS OF ARGUMENTATION: A literature review confirming the important role of knowledge management, including the Balanced Scorecard (BSC) methodology, in the assessment of the financial situation of joint-stock companies forms the basis of this research. The current state of the global economy is leading to a dangerous situation in which it is becoming increasingly difficult to maintain a secure financial cushion.

RESEARCH RESULTS: Estimation of an econometric model is expected to confirm the research hypothesis that KM plays a key role in the financial

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management of small and medium-sized listed companies, and especially in their investment decisions regarding the use of innovative methods such as BSC.

CONCLUSIONS, INNOVATIONS, AND RECOMMENDATIONS: The article explains the key role of KM in the financial management of small and medium-sized listed companies during crises. The results of the estimated model can serve the more effective management of SMEs listed on NewConnect and other alternative trading floors around the world.

Keywords:
SME sector, knowledge, listed companies, financial management

INTRODUCTION

Economic crises – including the COVID pandemic and the military conflict in Ukraine, which led to an energy crisis and inflation – pose a threat to the entire world. Consequently, high energy prices have increased the prices of products and services offered by companies. For many small and medium-sized listed companies, these phenomena pose a huge challenge, possibly leading to a deterioration of their financial condition.

In the activities of the surveyed business entities, knowledge of their investments should play a decisive role, and this is the main research objective in the presented article. Knowledge management using the Balanced Scorecard (BSC) method is extremely important from a financial point of view.

The aforementioned crises are hitting the slowing world economy hard, leading to a dangerous situation in which the so-called "safe financial cushion" is lost. Nevertheless, in the face of such highly unfavorable conditions, an interesting trend can be observed in which small listed companies accumulate savings and postpone larger investments for so-called "better times". In view of the above, knowledge management should be considered a key factor in the development of small and medium-sized stock companies in the context of cooperation combined with competitiveness (Małecka, 2020; Małecka, 2021).

Without conscious knowledge management, it is difficult to talk about the rational use of the BSC method; this is also referred

to as the Human Resources Management Scorecard, and it is designed to examine the efficiency of an organization's operations in four dimensions: financial, internal processes, customer service and infrastructure.

The purpose of the article is to clarify the importance of the key role of KM in the financial management of small and medium-sized listed companies that are struggling to make investment decisions in the face of the previous pandemic and the current military conflict in Ukraine, which is causing another crisis – an energy crisis. The focus is on investigating which component of the BSC methodology (financial, internal processes, customer service or infrastructure) has the greatest impact on the knowledge management of investments made, measured by the turnover rate of selected joint-stock companies. The econometric model's estimation will confirm that knowledge management plays a key role in the financial management of small and medium-sized entities in terms of realizing investments.

RESEARCH METHODOLOGY

The research method used in this article is based on the analysis of stock market data describing the financial condition of small and medium-sized listed companies which are negatively affected by the pandemic and the military conflict in Ukraine, as a consequence of which companies around the world are facing rising energy costs and inflation. The research period covered small and medium-sized companies listed on the SME-dedicated alternative trading platform in the period 05.2023–09.2023 (thus, the research sample is 38 months in the mentioned period, which indicates the quantitative nature of the research). On the basis of selected financial data, an econometric model will be estimated with the aim of explaining the correlation mechanism between the investment decisions made by managers in charge of small and medium-sized listed companies in such difficult times and the knowledge management process of their investments. The task of the presented model is analysis of the relationships between several variables (Dziechciarz, 2003). Thus, the estimated econometric model is described by the following variables:

y – evaluation of the knowledge management process of the investments made, measured by the index of company turnover;
x_1 – the financial dimension of the companies' health, determined by the C/Z ratio, which describes the relationship between stock market capitalization and total net profits;
x_2 – the dimension of internal processes affecting the financial health of companies determined by the dividend rate;
x_3 – a dimension of customer service that affects the financial health of companies, determined by the number of orders made on the spot market, which is significant in terms of the level of satisfaction of customers using their services or buying their goods;
x_4 – the dimension of infrastructure affecting the financial health of companies.

Of course, the culmination of the verified model is the examination of the cause-and-effect relationship between the dependent variable and the independent variables. The presented model includes panel data that also has time series characteristics.

Knowledge management in the investment decision-making process of managers of small and medium-sized listed companies – a literature review

In compiling a literature review, one finds many definitions of 'knowledge management'. The world economy has moved toward knowledge based on many of the current enterprise models that leverage advancements within information and communication technology. Listed enterprises pay more attention to understanding, managing and adapting to environmental changes, and they try to outdo each other in the acquisition and expanding of knowledge management (Ehsan & Jafar, 2020; Małecka, 2021; 2020; Gupta et. al., 2018).

Analyzing the impact of an enterprise's knowledge management could provide information about its capabilities within the area of innovation performance. Knowledge management capabilities contribute to improvement of the financial condition of enterprises listed on the NewConnect market (Yuanqin, 2022; Vilia Biglieri & Małecka,

2021; Mohammadi & Samadzadegan, 2020; Naqshbandi & Jasimuddin, 2018).

According to experts from the consulting firm Price Waterhouse Coopers, established in 1998, knowledge management is: "the art of transforming information and intellectual assets into lasting value for an organization's customers and employees. The hallmark of this approach is to treat knowledge management as an art".

Referring to the activity of small and medium-sized listed companies in the implementation of investments, it can be confidently stated that knowledge management is understood as "the totality of processes that enable the creation, dissemination and use of knowledge to achieve the objectives of the organization" (Murray & Myers, 1997; Strojny, 2000). In the context of the introduction of innovative solutions, whether considering the production of finished products or the offering of services, SME companies are increasingly aware of the importance of knowledge management in their operations. The competitive advantage depends on government policy and how quick firms are to bring new products or services to the market (Saussois, 2003).

Knowledge management is also financial literacy management. Van Rooij, Lusardi and Alessie tried to present a positive correlation between financial literacy and financial knowledge or stock ownership (Van Rooij et al., 2011). The knowledge described is only related to the ownership of investment accounts (Gill & Bhattacharya, 2017).

According to experts at the Institute of Leaders of Change, the strategic dimension of knowledge management is particularly relevant to development of the Balanced Scorecard (BSC) methodology (also known as the Human Resources Management Scorecard), which examines the effectiveness of organizational functioning in 4 dimensions (Dębowski, 2008; Tarver, 2023; Devkant & Satish, 2014; Investopedia, 2023):

- financial,
- internal processes,
- customer service,
- infrastructure.

Total strategy maps that include BSC methodology should provide a predictive model of business performance in the context of making investment decisions (Jones, 2016; Velnampy & Nimalathasan, 2012).

In this situation, it is advisable to pay attention to the process of managing collective knowledge, which should be accessed by the entire team of employees of a small and medium-sized listed company. As a result, the power of KM will come from the art of managing the people involved in the process of creating and acquiring knowledge, and processing it for the implementation of risky but profitable investment projects aimed at bringing more innovative products or services to the market.

In Poland, small and medium-sized listed companies are served by the NewConnect market. This market is designed to finance the development of small and medium-sized companies with high growth potential, or emerging or young companies characterized by low expected capitalization values. The surveyed businesses operate mainly in the so-called "high-tech" sectors (IT, electronic media, biotechnology, alternative energy, etc.), which is based on intangible assets. The strongest growth is seen in enterprises from these branches as they are connected with the global economy (Waląg, 2023). An additional characteristic is that the costs and paperwork requirements of listing on NewConnect are lower compared to the WSE, which is a regulated market. Compared to the main stock exchange, companies also have fewer obligations to post public information about their financial condition (NewConnect, 2023; Vilia Biglieri & Małecka, 2021; Ejsmont, 2015) or to collaborate with the main stock exchange (Małecka, 2017). The complexity of global change in knowledge management highlights the necessity of collaborative engagement between different fields in an SME's international activity (Audretsch et al., 2020; Welter et al. 2019; Tavassoli et al., 2017).

In such dynamic times, knowledge has come to function both politically and economically and has been directed to actions taken by the managers of listed companies, in this case SME companies. Many experts stress that the management of knowledge in the process of investment decision-making by the leaders of listed companies is closely related to its positive impact on improving their financial condition.

Small and medium-sized listed companies on the NewConnect market – research results

GRETL and Excel were used to analyze the results of the research and estimate predictive data for subsequent periods. A detailed description is presented in Table 1.

Table 1. Data from the research period 03.2020–30.04.2023, showing the impact of the knowledge management process in the context of BSC methodology on the financial health of small and medium-sized joint stock companies listed on the NewConnect market

Lp.	Research period	Companies' turnover rate (%) y	P/E ratio (%) x1	Dividend yield (%) x2	Number of orders in the spot market x3	Number of companies x4
1.	03.2020	155.60	00.00	0.60	1,163,726	377
2.	04.2020	256.70	00.00	0.50	1,402,959	378
3.	05.2020	172.30	00.00	0.40	1,374,328	376
4.	06.2020	130.30	00.00	0.40	1,403,563	372
5.	07.2020	255.20	00.00	0.30	2,408,953	373
6.	08.2020	207.20	41.10	0.30	2,241,622	375
7.	09.2020	161.20	18.00	0.30	1,910,440	376
8.	10.2020	325.60	15.10	0.30	2,472,108	374
9.	11.2020	204.10	24.60	0.30	1,956,381	374
10.	12.2020	165.40	23.70	0.30	1,915,553	373
11.	01.2021	132.00	21.10	0.30	1,693,385	374
12.	02.2021	38.40	00.00	0.80	1,470,521	383
13.	03.2021	76.80	31.30	0.30	2,120,475	376
14.	04.2021	55.20	29.70	0.40	1,994,017	366
15.	05.2021	44.30	27.90	0.40	1,728,379	366
16.	06.2021	34.00	29.80	0.40	1,590,559	365
17.	07.2021	27.10	29.30	0.60	1,438,866	367
18.	08.2021	30.20	00.00	0.60	1,549,040	366
19.	09.2021	37.70	00.00	0.70	1,755,585	371
20.	10.2021	40.20	00.00	0.70	1,806,012	373
21.	11.2021	36.60	00.00	0.80	1,671,867	378
22.	12.2021	43.00	00.00	0.70	1,714,764	380

23.	01.2022	42.40	00.00	0.70	1,553,370	383
24.	02.2022	38.40	00.00	0.80	1,470,521	383
25.	03.2022	36.70	00.00	0.80	1,565,916	381
26.	04.2022	32.80	00.00	0.90	1,217,675	381
27.	05.2022	22.00	00.00	0.90	1,148,242	381
28.	06.2022	22.80	00.00	0.90	1,130,946	382
29.	07.2022	21.00	00.00	0.80	1,099,188	381
30.	08.2022	24.80	00.00	0.80	1,241,861	380
31.	09.2022	16.00	00.00	0.80	1,110,075	376
32.	10.2022	15.90	00.00	0.80	1,047,264	379
33.	11.2022	21.40	266.60	0.80	1,093,321	379
34.	12.2022	31.10	00.00	0.80	1,282,307	379
35.	01.2023	31.60	00.00	0.70	1,163,402	361
36.	02.2023	32.60	00.00	0.70	1,180,606	359
37.	03.2023	23.70	00.00	0.70	1,214,905	359
38.	04.2023	27.90	00.00	0.80	960,281	360

Source: own elaboration based on: https://newconnect.pl/statystyki-okresowe (accessed on 16th May 2023).

The analysis of the data shows that throughout the entire period under review, i.e., 03.2020–04.2023, the data describing the financial condition of small and medium-sized joint stock companies listed on the NewConnect market showed significant fluctuations. In addition, observations show that the companies' turnover ratios, C/Z, the number of orders and the total number of companies mostly showed a downward trend. The data presented in the table above are used to estimate the econometric model.

Table 2. The final model's estimation: OLS, using observations 2020:03–2023:04 (T = 38). Dependent variable: y

Specification	**Coefficient**	**Std. Error**	**t-ratio**	**p-value**	
const	-961.691	460.474	-2.088	0.0441	**
x2	-315.241	41.1912	-7.653	<0.0001	***
x4	3.29862	1.24797	2.643	0.0122	**

Mean dependent var	80.79474	S.D. dependent var	82.15251
Catfish squared resid	93174.06	S.E. of regression	51.59570
R-squared	0.626877	Adjusted R-squared	0.605556

F(2,35)	29.40146		P-value (F)	3.22e-08
Log-likelihood	-202.2078		Akaike criterion	410.4156
Schwarz criterion	415.3283		Hannan-Quinn	412.1635
rho	0.446631		Durbin-Watson	1.060962

Source: own elaboration based on Table 1.

As part of the econometric model's estimation, the following tests were performed to confirm that the model is correct:

Non-linearity test (squares):

Null hypothesis: relationship is linear

Test statistic: LM = 0.194864 with p-value = P(Chi-square(2) > 0.194864) = 0.907164

Non-linearity test (logs):

Null hypothesis: relationship is linear

Test statistic: LM = 0.331344 with p-value = P(Chi-square(2) > 0.331344) = 0.847324

RESET test for specification:

Null hypothesis: specification is adequate

Test statistic: F(2,33) = 2.98974 with p-value = P(F(2,33) > 2.98974) = 0.0640743

White's test for heteroskedasticity:

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 8.62915 with p-value = P(Chi-square(5) > 8.62915) = 0.124802

White's test for heteroskedasticity (squares only):

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 8.55958 with p-value = P(Chi-square(4) > 8.55958) = 0.0731016

Breusch-Pagan test for heteroskedasticity:

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 15.0472 with p-value = P(Chi-square(2) > 15.0472) = 0.000540172

Breusch-Pagan test for heteroskedasticity (robust variant):

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 8.19986 with p-value = P(Chi-square(2) > 8.19986) = 0.0165738

Test for normality of residual:

Null hypothesis: error is normally distributed
Test statistic: Chi-square(2) = 6.56282 with p-value = 0.0375752
Chow test for structural break at observation 2021:09:
Null hypothesis: no structural break
Test statistic: F(3,32) = 4.07255 with p-value = P(F(3,32) > 4.07255) = 0.0147359
LM test for autocorrelation up to order 12:
Null hypothesis: no autocorrelation
Test statistic: LMF = 1.50899 with p-value = P(F(12,23) > 1.50899) = 0.191339
Test for ARCH of order 12:
Null hypothesis: no ARCH effect is present
Test statistic: LM = 24.4833 with p-value = P(Chi-square(12) > 24.4833) = 0.0174705
QLR test for structural break:
Null hypothesis: no structural break
Test statistic: chi-square(3) = 57.3773 at observation 2021:01 with asymptotic p-value = 3.03123e-11
CUSUM test for parameter stability:
Null hypothesis: no change in parameters
Test statistic: Harvey-Collier t(34) = -0.91417 with p-value = P(t(34) > -0.91417) = 0.367065.

The final estimation of the econometric model showed that it is a linear model with four explanatory variables. Taking into account the classical method of least squares, it takes the following form:

$$\Psi\tau = \alpha 0 + \alpha 1\ \xi 1\tau + \alpha 2\ \xi 2\tau + \ldots + \alpha\phi\ \xi j\tau + \varepsilon\tau \Rightarrow \Psi\tau = \alpha 0 + \alpha 1\ \xi 1\tau + \alpha 2\ \xi 2\tau + \alpha 3\ \xi 3\tau + \alpha 4\ \xi 4\tau + \varepsilon\tau\ (\tau = 1, 2 \ldots \nu) \Rightarrow \Psi\tau = \alpha 0 + \alpha 2\ \xi 2\tau + \alpha 4\ \xi 4\tau + \varepsilon\tau$$

where:
n – the number of units studied,
j – the number of explanatory variables,
xt, α, α01 , ..., αj – model parameters,
Et – random component.

The correlation analysis between the two variables clearly indicates that the explanatory variables, x_2 and x_4, used in the constructed

model are quite strongly correlated with each other. The sample size of n=38, combined with the p-values calculated for each variable, confirms that knowledge management has a positive impact on the percentages of turnover rates of the listed companies in the research period 03.2020–04.2023. The presented results should confirm that when geographical modifications are taken into account in the Balanced Scorecard, they are a very important kind of measurement of the execution strategy (Niven 2012).

In the estimated econometric model, the p-value is within the level of 0.01, while R^2 is 0.63. In the process of estimating the econometric model, selected tests were conducted to evaluate the model that also confirmed that it has the correct specification. Heteroskedasticity of the residuals is practically absent. Tests for nonlinearity (squares and logarithms) confirmed that it is a linear model.

In the presented article, the forecasting process is carried out and the positive impact of knowledge management (KM) is described, including the BSC method of improving the financial condition in terms of investment realization of small and medium-sized joint stock companies listed on the NewConnect market. Taking into account the influence of the two explanatory variables, x_2 and x_4, on the explanatory variable, y, the econometric model is a more or less faithful reflection of the studied reality. The forecasting process is illustrated by the following equation:

$$Y^* = -961.6908951 - 315.2413292\ x2 + 3.298623389\ x4$$

Table 3. Data describing the forecast econometric model

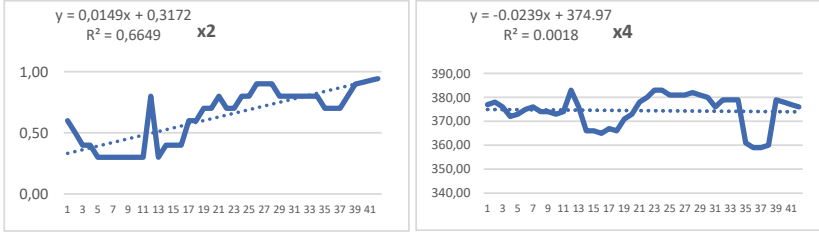
Lp.	Research period	Companies' turnover rate (%) y	Dividend yield (%) x2	Number of companies x4
1.	03.2020	155.60	0.60	377
2.	04.2020	256.70	0.50	378
3.	05.2020	172.30	0.40	376
4.	06.2020	130.30	0.40	372
5.	07.2020	255.20	0.30	373
6.	08.2020	207.20	0.30	375
7.	09.2020	161.20	0.30	376
8.	10.2020	325.60	0.30	374

9.	11.2020	204.10	0.30	374
10.	12.2020	165.40	0.30	373
11.	01.2021	132.00	0.30	374
12.	02.2021	38.40	0.80	383
13.	03.2021	76.80	0,30	376
14.	04.2021	55.20	0.40	366
15.	05.2021	44.30	0.40	366
16.	06.2021	34.00	0.40	365
17.	07.2021	27.10	0.60	367
18.	08.2021	30.20	0.60	366
19.	09.2021	37.70	0.70	371
20.	10.2021	40.20	0.70	373
21.	11.2021	36.60	0,80	378
22.	12.2021	43.00	0.70	380
23.	01.2022	42.40	0.70	383
24.	02.2022	38.40	0,80	383
25.	03.2022	36.70	0.80	381
26.	04.2022	32.80	0.90	381
27.	05.2022	22.00	0.90	381
28.	06.2022	22.80	0.90	382
29.	07.2022	21.00	0.80	381
30.	08.2022	24.80	0.80	380
31.	09.2022	16.00	0.80	376
32.	10.2022	15.90	0.80	379
33.	11.2022	21.40	0.80	379
34.	12.2022	31.10	0.80	379
35.	01.2023	31.60	0.70	361
36.	02.2023	32.60	0.70	359
37.	03.2023	23.70	0.70	359
38.	04.2023	27.90	0.80	360
39.	*05.2023*	*5.34*	*0.90*	*379*
40.	*06.2023*	*-2.66*	*0.91*	*378*
41.	*07.2023*	*-10.65*	*0.93*	*377*
42.	*08.2023*	*-18.65*	*0.94*	*366*
43.	*09.2023*	*-23.38*	*0.96*	*366*

Source: own elaboration.

One major challenge in stock markets is the use of the tools which are needed in the process of forecasting (Nametala et. al, 2023). The predictions for the research period 05.2020–09.2023 that are presented in Table 3 confirm that improved financial condition is most strongly influenced by the explanatory variable, x_2, and to a lesser extent by the variable x_4. Unfortunately, the complex economic crises that have been ongoing almost since March 2020 may cause the turnover ratios of small and medium-sized companies listed on the NewConnect market to fall to negative levels in the future (see Figure 1).

Figure 1. Trend lines describing the impact of knowledge management with BSC methodology on the financial health of small and medium-sized listed companies during the research period 03.2020–04.2023



Source: own elaboration.

When analyzing the value of the regressors, x_2 and x_4, both of which influence the variable y, it should have been concluded that the coefficient of determination R^2 calculated for the entire period under study for the explained variable x_2 showed an increasing trend from year to year, in contrast to the variable x_4. In general, the econometric model estimated by the author in the presented article shows a positive effect of the independent variables on the dependent variable y.

CONCLUSIONS AND RECOMMENDATIONS

The purpose of the article is to clarify the importance of the key role of KM in the financial management of small and medium-sized listed companies that are struggling to make investment decisions in the face of the COVID pandemic and now the military conflict in Ukraine, which has triggered an energy crisis. The idea, therefore, was to

verify the research hypothesis, which assumed a positive impact of the knowledge management process on improving the financial condition of the listed companies under study, and to construct an economic model that allows the analysis of investment decisions made in this regard.

The added value of the presented research is, first of all, that it clarifies the key role of knowledge management, taking into account the BSC methodology analyzed in four dimensions:

- financial,
- internal processes,
- customer service,
- infrastructure.

The period of the study takes into account the crisis situation, which, as it turned out, most companies of the 21st century are not ready for. This is because the financial situation of the studied small and medium-sized listed companies is affected by inflation. The econometric model used in the study was designed to confirm how knowledge is used in managing investment decisions made by managers of small and medium-sized listed companies, which was the main objective of the study.

The results of the research, based on the data on which the econometric model was built, confirmed the fact that the improvement of the financial condition of the surveyed companies, measured by the turnover ratio, was most influenced by the dimension of internal processes, measured by the dividend rate, and to a much lesser extent by the dimension of infrastructure, measured by the total number of companies listed on the NewConnect market. However, complex economic processes in the form of an increasing number of crises may cause a sharp rise in the percentage values of companies' turnover rates in the future (research period 05.2023–09.2023), as a result of which they may record negative values.

Thanks to the estimation of the model, it will be possible to verify the development forecasts of the small and medium-sized listed companies sector for the coming years. The results presented in the article and the model can serve more effective management of business entities listed on NewConnect in Poland and other alternative trading floors in Europe and around the world.

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