ABSTRACT. The aim of the study is to recognize management opinions on the issue of measuring economic efficiency in industrial enterprises. The article uses information from an interview conducted with the use of a questionnaire. The research objects were industrial enterprises represented by joint stock companies from the macro-sector of industry according to the classification of the Warsaw Stock Exchange (WSE). In order to assess the economic effectiveness of enterprises, profitability ratios are most often used by managers. The assessment of economic efficiency in over half of the companies is carried out quarterly, by special departments, as well as by accounting departments, which are responsible for this. Managers in each economic unit, individually and with regard to information or decision-making needs, should specify the scope as well as the criteria for measuring economic efficiency. Both financial and non-financial measures should be used to measure economic efficiency in enterprises.

INTRODUCTION

The measurement, as well as evaluation of economic efficiency of a company require the use of various measures in the form of measures and indicators, which allow to determine efficiency in various aspects [Jaki 2006]. A measure is an economic category that can be counted (quantified) and expressed by a number that quantifies a part of the social and economic reality. The indicator is a way of expressing the dynamics of economic measures, so a comparison in time or space [Timofiejuk 2002].

Lucjan Czechowski [1997] noted that the classification of economic efficiency measures in terms of their synthetic and partial capacity raises less controversy. Synthetic measures make it possible to determine the economic efficiency of a company by means of one aggregate size [Szymańska 2010], characterized by high capacity and reflects many aspects of the company’s activity [Twaróg 2003]. On the other hand, partial measures are used for analytical purposes as an instrument of simple and unambiguous assessment [Czechowski 1997] of the use of particular types of resources, costs and types of activity [Dąbrowski 2012]. In the case of using both partial measures and the synthetic measure in the assessment, it should be assumed that the synthetic measure plays a superior role
while partial measures complement and develop the content of this measure [Czechowski 1997, Dąbrowski 2012]. Renata Piętowska-Laska [2005] states that the classic model of D. Scott Sink and Thomas C. Tuttle’s economic effectiveness analysis [Sink, Tuttle 1989], covering measures, i.e. effectiveness, productivity, quality, productivity, quality of working conditions, innovativeness and profitability in light of changes in the economy, requires some additions. It stresses that economic efficiency depends, to a greater extent, on satisfaction and the satisfaction of customers, employees and shareholders, the quality of working conditions and the market position of the undertaking.

At the end of the 20th century, there was a change in approach to assessing the effects of a company’s operations, by shifting the focus from maximising profit to maximising value for owners. A new look at the measurement of effectiveness of enterprise value creation processes considered from the prism of study by Andrzej Jaki [2006] indicates that individual measures of economic effectiveness may occur in the form of absolute (measures of value) and relative measures (measures of return). Rafał Wilczyński [2014] states that accounting indicators are the most common form of measuring effectiveness in index analysis. According to Andrzej Jaki [2006], accounting, financial and market measures of economic efficiency of enterprises are of a partial nature and are mainly used in short-term analyses. In the context of long-term analysis, a synthetic market efficiency measure, referred to as company value, is applied. According to Apathukatha Sivathanu Pillai et al. [2002], a performance measurement system is necessary to express the needs and expectations of all stakeholders. They also argue that to ensure that there are no conflicts, disputes or blame, effectiveness in meeting stakeholder needs must be regularly measured and evaluated. The performance measurement systems of Efthathios Tapinos et al. [2005] play a key role in translating strategy into action. Andy Neely et al. [1995] defines a performance measurement system as a set of measures used to quantify performance and efficiency.

The aim of the study is to recognize management opinions on measuring economic efficiency in industrial enterprises listed on the Warsaw Stock Exchange.

**MATERIAL AND TESTING METHODS**

The issues discussed in the paper are part of the research on the economic efficiency of industrial enterprises depending on the phase of their life cycle [Kuś, Żurakowska-Sawa 2012, 2017, Wasilewski, Żurakowska-Sawa 2017]. In 2015, a questionnaire-driven interview was conducted. The intentions set out for the purpose of the study were implemented on the basis of surveys, through analytical descriptive analysis of result sets in the average population and according to two criteria for grouping enterprises. The research facilities were industrial enterprises represented by joint-stock companies from the macro-sector of industry according to the classification of the Warsaw Stock Exchange (WSE), which published its annual financial statements (the financial year coincided with the calendar year) and were on the stock exchange from the date of the first listing (IPO) for the entire...
analysed period\(^1\). The Warsaw Stock Exchange, in 1999-2012, classified listed companies into sectors of the economy\(^2\) depending on the type of economic activity carried out according to the European Classification of Economic Activities (ECE) and the structure of income [Resolution No. 183/98]. The selection of such research facilities results from the fact that, in economic policy, the manufacturing sector cannot be neglected, not only because of its functions in the economy, but also because it is one of the most important links of technological progress and the direct and indirect creation of jobs. It also constitutes the basis for the development of the modern business services sector [Poniatowska-Jaksch, Sobiecki 2015]. Empirical material was obtained from 66.7% of the surveyed population, i.e. from 16 enterprises (Table 1).

Responses from the interviewed participants were grouped according to two criteria, i.e. return on equity (ROE) and the life cycle phase of the company. The first grouping criterion uses a traditional efficiency indicator, which is widely used in economic practice. Within this criterion, management responses were further divided into three groups using the quartile method. The first group (I) includes companies with index sizes smaller than or equal to the first-lower quartile (25% of the surveyed population). ROE for this group ranged from -6.6% to 1.4%. The second group (II) included enterprises with the size of the indicator larger than the first quartile and smaller than the third quartile (50% of the surveyed population). ROE for this group ranged from 1.7% to 8.9%. The third group (III) consisted of enterprises with an indicator greater than or equal to the third quartile.

When selecting the time period for the research, on the one hand, the aim was to obtain the longest possible series of data and, on the other hand, to cover as many entities as possible. Taking 1998 as the starting year as the one with the highest number of listed companies after the debut and covering the years 1998-2002, it turned out that the number of companies amounted to 15. A similar situation was observed in 1999. Taking into account the criterion of the largest number of surveyed entities as well as similar macroeconomic conditions in which companies started their activity, it was assumed that listed companies which had their debut both in 1997 and 1998 were taken into account in the research. The upper limit of the financial analysis horizon was completed in 2012, as the inclusion of subsequent accounting periods, e.g. 2013 or 2014, in the study would result in a decrease in the number of surveyed companies due to their exclusion from the Warsaw Stock Exchange, which would result in a decrease in the number of data included in the study. 30 companies were selected for preliminary assessment, but due to a lack of data in annual financial statements, which made it impossible to calculate the financial ratios selected for the audit, 24 entities were finally audited.  

As of December 31, 2012, the Warsaw Stock Exchange conducted a sector division in which it distinguished 28 sectors of the national economy, grouped into three main sectors (macro-sectors), i.e. industry, finance and services [Resolution No. 187/2011]. The new sectoral classification became effective on 1 January 2017 [Resolution No. 1343/2016].

Table 1. Number of enterprises surveyed according to the criteria for grouping them

<table>
<thead>
<tr>
<th>Number of stock companies according to the criteria:</th>
<th>return on equity</th>
<th>phase of the company’s life cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>group I</td>
<td>group II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

Source: own calculations
upper quartile (25% of the surveyed population). The ROE for this group ranged from 9.9% to 35.3%. The second criterion for the division of companies was their belonging to one of five phases of the company’s life cycle. The first group included enterprises in the introduction phase, the second – in the growth phase, the third – in the maturity phase, the fourth – in the shake-out phase, the fifth – in the decline phase. To capture the life cycle phase of a company, the Dickinson model [2011] was used, based on a combination of balance signs with cash flows at the end of the financial year from three activities, i.e. operating, financial and investment (Table 2).

Table 2. Phase of life cycle stages using cash flow component signs

<table>
<thead>
<tr>
<th>Activity</th>
<th>Phases of the company’s life cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>introduction</td>
</tr>
<tr>
<td>Investment</td>
<td>-</td>
</tr>
<tr>
<td>Operational</td>
<td>-</td>
</tr>
<tr>
<td>Financial</td>
<td>+</td>
</tr>
</tbody>
</table>

Source: own elaboration based on [Dickinson 2011, p. 1974]

RESULTS OF STUDIES

The choice of tools measuring the economic efficiency of an enterprise may result from the understanding of the purpose of the business unit by managers. When understanding the objective of maximizing profit, traditional concepts using financial measures, e.g. profitability ratios, are appropriate. In turn, for companies that consider it a goal to generate value for shareholders, the most appropriate concepts are e.g. EVA [Michalak 2008]. Enterprises are created by their owners with the intention of obtaining specific desired states and assume as business purposes. The analysis of the behavior of enterprises has led to different formulations of objectives pursued by enterprises, which can be, for example, divided into two groups, i.e. accentuating economic and other benefits. The first group includes such goals as maximizing the value of the company in the long run, a satisfactory level of return on capital, productivity of input or resources, achieving a satisfactory level of profit, maximizing sales, maximizing remuneration (management board or all employees), while the second enterprise survival, maintaining the current level of employment or achieving the assumed market share [Janik, Paździor 2011]. Increasing sales is the main goal of the functioning of enterprises, according to 28% of company representatives, on average (Table 3). On average, 20% of managers indicated the creation of value for owners, while maximizing accounting profit, increasing the value of the company and market share, on average 12% of respondents declared these as the primary goal of the company’s activity. Representatives from companies with the lowest ROE claimed that the overriding goal of enterprises is to increase sales (50%), while those with the highest ROE that it is creating value for owners (60%).

In enterprises in the growth and shake-out phase, increasing sales (33.3% and 25%, respectively) were indicated as the primary goal of the enterprise’s activity, while in those
from the maturity phase, creating value for owners (37.5%). Representatives of companies in the phase of introduction and decline, pointing to the overarching goal of the company, gave several answers, which can be seen in light of a behavioral approach, which does not talk about one goal, but about the implementation of a “bundle of goals” as the effect of reaching a compromise between individual stakeholder groups. The enterprise must satisfy the interests of various groups of internal stakeholders, hence it is difficult to talk about maximizing profit or maximizing market value as the basic goal of the functioning of enterprises [Wilczyński 2014].

Knowledge of the set of goals and their structure enables the assessment of the company’s activity. The tools indicated by the respondents as the most frequently used to measure economic efficiency in their enterprises were profitability indicators (an average of 31.9% of indications) and measures based on the concept of enterprise value (an average of 25.5% of indications) (Table 4). Representatives of companies with the lowest ROE level indicated that most often, in their enterprises, profitability indicators and measures based on the concept of company value (33.3% each) are used to measure economic efficiency. Along with an increase in the level of return on equity, a decreasing trend of indications concerning the use of measures based on the company concept, e.g. EVA (from 33.3% to 21.4% of indications), was observed, while a growing trend was observed in the case of the use of stock exchange indicators (from 11.1% to 21.4% of indications).

In companies in the phases of introduction, shake-out and decline, it was pointed out that both profitability ratios and measures based on the company’s concept, such as EVA, were used to measure economic efficiency (50%, 28.6% and 28.6%, respectively). In the

---

Table 3. The main goal of the functioning of enterprises

<table>
<thead>
<tr>
<th>Specification</th>
<th>Grouping criteria [%]</th>
<th>( \bar{x} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>Maximizing accounting profit</td>
<td>25.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Increasing the value of the company</td>
<td>0.0</td>
<td>12.5</td>
</tr>
<tr>
<td>Minimizing business costs</td>
<td>0.0</td>
<td>12.5</td>
</tr>
<tr>
<td>Creating value for owners</td>
<td>25.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Increasing sales</td>
<td>50.0</td>
<td>31.3</td>
</tr>
<tr>
<td>Increasing the market share</td>
<td>0.0</td>
<td>18.8</td>
</tr>
<tr>
<td>Improving the quality of offered products/ervices</td>
<td>0.0</td>
<td>12.5</td>
</tr>
</tbody>
</table>

* I group (ROE > than the first-lower quartile), II group (ROE > than the first-lower quartile and ROE < than the third quartile), III group (ROE ≥ than the third quartile), W – introduction phase, WZ – growth phase, D – maturity phase, WS – shake-out phase, U – decline phase

Source: own calculations

---

3 The description of survey results was based on the term percentage (%), which should be understood as a percentage of indications in the case of more than one answer, while in the case of the possibility to choose only one answer, as a percentage of answers in %.
companies in the introduction phase, employment effectiveness indicators, cost index analysis and stock exchange indicators were not used to measure the economic efficiency of the company. Representatives of all companies did not indicate that they use quantitative methods to measure the economic efficiency of the company, which may result from difficulties related to their implementation.

The manner and frequency of collecting information related to the measurement of economic effectiveness primarily results from the information needs of company managers. In companies listed on the Warsaw Stock Exchange, the frequency of gathering information to assess economic efficiency is probably consistent with the obligation to publish current reports (concerning any circumstances or events that may have a material impact on their economic, property or financial situation) and periodic reports (quarterly, half-yearly, annual), but also with the current needs of the company. The obligation to publish periodic reports has a direct source in the provisions of the Directive on transparency of information about issuers [Directive 2013/50/EU of 22 October 2013], which determines the scope and dates of the publication of these reports. The regulations of the directive are reflected in the Regulation of the Minister of Finance on the basis of Polish law, in which it is indicated that periodic information is published in the form of quarterly, semi-annual and annual reports [Journal of Laws of 15 June 2016, item 860].

Table 5 presents information on statements related to the frequency of assessment of economic efficiency in enterprises. On average, 56.3% of company representatives indicated that the assessment of economic effectiveness is carried out in companies once a quarter, on average 25% of them declared that once a month, while the assessment of effectiveness once every six months was carried out by 12.5% of respondents, and in the case of an average of 6.3% of them such assessment is carried out once a year. Representatives of enterprises with the lowest and average ROE levels stated that, in their enterprises, the assessment of economic effectiveness primarily takes place quarterly (75% and 50% of responses respectively), while managers from companies with the highest return on equity indicated that once a month (75% of responses).
In companies in the introduction, growth and shake-out phases, the assessment of economic efficiency is mainly carried out quarterly (100%, 50% and 50% of responses, respectively), while in companies in the maturity phase, such assessment is carried out once a month (75% of responses, respectively). Both monthly and quarterly economic effectiveness is assessed in enterprises in the phase of decline (50% of indications, respectively).

Depending on the period of time, the assessment of economic efficiency may be carried out in enterprises while applying a different scope or using different tools in this assessment. A proper performance measurement system provides companies with accurate, reliable and relevant information at the right time, allowing managers to adapt flexibly to changing environmental conditions in particular.

### SUMMARY

The paper presents manager opinions on issues concerning economic efficiency measurement in industrial enterprises listed on the Warsaw Stock Exchange. On the basis of the conducted research, the following conclusions were formulated:

1. The analyzed enterprises did not record one overarching goal, only a bundle, which, on the one hand, probably results from the fact that it is impossible to determine one of the most important measures of enterprise effectiveness. On the other hand, a multitude of goals can be a result of the desire to satisfy different groups of stakeholders. In enterprises indicating, as the primary goal, the creation of value for owners, increasing sales, or maximizing accounting profit, the tools used to measure economic efficiency in enterprises were both profitability ratios and measures based on the concept of enterprise value (e.g. EVA). The choice of several tools for measuring economic efficiency by managers can be an expression of the desire to improve specific economic relationships that express the efficiency of the enterprise.

2. Despite the availability of various tools for measuring the economic effectiveness of enterprises, profitability indicators are most frequently used by managers to assess this effectiveness. On the one hand, this may be because profitability is considered to be a synthetic measure of a company’s economic efficiency, which is a consequence of the method of calculating the financial result. On the other hand, it may be a result

---

Table 5. Frequency of assessment of economic efficiency in enterprises

<table>
<thead>
<tr>
<th>Specification</th>
<th>Grouping criteria [%]</th>
<th>ROE</th>
<th>life cycle phase</th>
<th>( \bar{X} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I</td>
<td>II</td>
<td>III</td>
</tr>
<tr>
<td>Once a month</td>
<td>25.0</td>
<td>12.5</td>
<td>75.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Once a quarter</td>
<td>75.0</td>
<td>50.0</td>
<td>25.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Once every six months</td>
<td>0.0</td>
<td>25.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Once a year</td>
<td>0.0</td>
<td>12.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Signs: see Table 2

Source: own calculations
of difficulties related to obtaining data as well as the comparability and interpretation of available measures of effectiveness.

3. The economic efficiency assessment, in more than half of the enterprises, is carried out once a quarter, which probably, apart from the information obligations of the companies, results from setting the measurement frequency so as not to allow too long intervals between measurements, thus also avoiding delays, e.g. in the implementation of set goals and information support for managers.

BIBLIOGRAPHY


Rozporządzenie Ministra Finansów z dnia 25 maja 2016 roku zmieniające rozporządzenie w sprawie informacji bieżących i okresowych przekazywanych przez emitentów papierów wartościowych oraz warunków uznawania za równoważne informacji wymaganych przepisami prawa państwa niebędącego państwem członkowskim, § 82, Dz. U. z dnia 15 czerwca 2016 roku, poz. 860 (Regulation of the Minister of Finance of 25 May 2016 amending the Regulation on current and periodic information provided by issuers of securities and conditions for recognizing as equivalent information required by the laws of a non-member state, § 82. Journal of Laws of 15 June 2016, item 860.


Uchwała Nr 183/98 Zarządu Giełdy z dnia 24 marca 1998 rok w sprawie klasyfikacji sektorowej spółek giełdowych dla obliczania wskaźników i indeksów giełdowych (z późn. zm.), §1. (Resolution No. 183/98 of the WSE Management Board dated March 24, 1998 regarding sector classification of listed companies for calculation of stock exchange indices and indices (as amended), §1.


POMIAR EFEKTYWNOŚCI EKONOMICZNEJ
– DOŚWIADCZENIA ZARZĄDZAJĄCYCH PRZEDSIĘBIORSTWAMI

Słowa kluczowe: przedsiębiorstwa przemysłowe, efektywność ekonomiczna, miary efektywności ekonomicznej

ABSTRAKT

Celem opracowania jest rozpoznanie opinii osób zarządzających przedsiębiorstwem na temat problematyki pomiaru efektywność ekonomicznej w przedsiębiorstwach przemysłowych. W artykule wykorzystano informacje z wywiadu kierowanego z wykorzystaniem kwestionariusza. Obiektami badawczymi były przedsiębiorstwa przemysłowe, reprezentowane przez spółki akcyjne z makrosektora przemysłu, według klasyfikacji Giełdy Papierów Wartościowych (GPW) w Warszawie. Osoby zarządzające najczęściej do oceny efektywności ekonomicznej przedsiębiorstw stosowały wskaźniki rentowności. Ocenę efektywności ekonomicznej w ponad połowie przedsiębiorstw przeprowadzano raz na kwartał, przez wyodrębnione w tym celu specjalnie działy, które mają to w zakresie obowiązków, jak również przez księgowość. Osoby zarządzające w każdej jednostce gospodarczej, indywidualnie oraz w odniesieniu do potrzeb informacyjnych lub też decyzyjnych, powinny precyzować zakres, jak i kryteria pomiaru efektywności ekonomicznej. Zarówno miary finansowe, jak i niefinansowe powinny być stosowane do pomiaru efektywności ekonomicznej w przedsiębiorstwach.

AUTHORS

MIROSŁAW WASILEWSKI, DR HAB. PROF. WULS
ORCID: 0000-0001-6791-5713
Waraw University of Life Science – SGGW
Institute of Economic and Finance
166 Nowoursynowska St., 02-787 Warsaw, Poland

JOANNA ŻURAKOWSKA-SAWA, PHD
ORCID: 0000-0002-3811-4586
Pope John Paul II State School of Higher Education in Biała Podlaska
Faculty of Economic Sciences
95/97 Sidorska St., 21-500 Biała Podlaska, Poland