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Share Capital Increase Strategies And The Efficiency Of Listed Companies – A Polish-German Comparative Analytical Study

Abstract

This paper presents a theoretical-empirical study comprising a comparative analysis of the influence of specific strategies for increasing share capital on the economic efficiency of companies listed on the Polish and German capital markets. The paper consists of three parts. The first part includes the evaluation of possible relations between the efficiency of a company's activities and the process of share capital increase. The second part contains the results of empirical research on changes in share capital in the examined companies, which are listed on the WIG-20 and DAX indices. The third part presents the results of the study on their efficiency in the context of methods applied in order to increase share capital.

The assessment of the efficiency of publicly-listed companies was conducted by means of the nonparametric DEA method, using measures oriented on input and constant returns-to-scale. The effects (results) are shown by means of the following ratios: return on sales, return on equity, and return on assets, whereas the inputs are illustrated by ratios of share capital dynamics, financing total assets by share capital and equity dilution.

Keywords: *share capital, share capital increase, efficiency, Polish and German joint-stock companies*

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1. Introduction

The key problem in the strategic management of corporate finance is shaping the level and structure of equity, which implies the need for assessment of the efficiency of business units and multiplying their value. The issue is usually accompanied with the problem of raising equity, both from internal sources (capital generated as a result of current economic processes) and external sources (capital related to acquiring financial means in the business environment). Worth mentioning in this context is the analysis of changes in the efficiency of units induced by the increase in share capital value and structure.

The main purpose of this study was to examine the degree of diversification in the efficiency of Polish and German publicly-listed companies which were increasing share capital in different ways, i.e. in the ordinary mode and in the form of a conditional share capital increase, increase on the basis of authorized share capital, and increase from the company's own resources. The analysis was performed to test the general research hypothesis that stipulated that the form of increasing share capital basically differentiates the efficiency of public companies.

The research comprised joint-stock companies listed on the Warsaw Stock Exchange and included in WIG-20 Index, as well as the companies listed on the Frankfurt Stock Exchange (germ. Frankfurter Wertpapierbörse – FWB)[1] and included in DAX Index.

The analysis covered financial statements from 50 companies qualified for both indices on 02.09.2013. A ten-year research period, e.g. between 2003-2012, was chosen for conducting the attempted analysis. Empirical data for the study was obtained from the Notoria Serwis S.A. database, stock market bulletins, as well as from the Polish and German stock market websites.

2. Forms and methods of share capital increase in Polish and German joint-stock companies

In discussing the issue of share capital increase in a joint-stock company, the German literature describes two major types that need to be mentioned (Wöhe et al. 2011, p. 82):

[1] Frankfurter Wertpapierbörse (FWB) is the largest of seven stock exchanges in Germany and one of the most important financial centres in the world securities market. The organization of public trading is controlled by Deutsche Börse AG.

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- effective increase, connected with introducing new means to a company in the form of cash or in-kind contributions, and
- nominal increase, that relies on using a company's own resources (see Table 1).

Taking into consideration the Polish and German legal regulations, one can point out four methods for increasing share capital in a joint-stock company:

1. Ordinary share capital increase,
2. Conditional share capital increase,
3. Increase on the basis of authorized share capital,
4. Increase from the company's resources (C.C.C. 2000, art. 430-454; AktG 1965, paragraph 182-220).

Table 1. Forms and methods of share capital increase in a joint-stock company

Forms	Methods
Effective increase of share capital	Ordinary increase of share capital
	Conditional increase of share capital
	Increase on the basis of authorized share capital
Nominal increase of share capital	Increase from company resources

Source: own study on the basis of: *Commercial Companies Code* [C.C.C.] and G. Wöhe, J. Bilstein, D. Ernst, J. Häcker, *Grundzüge der Unternehmensfinanzierung*, VahlenVerlag, München 2011, p. 82.

On the basis of the Commercial Companies Code, an ordinary capital increase is effected through the issue of new shares or increasing the nominal value of current shares. According to the provisions of AktG, an ordinary share capital increase involves only the issuance of new shares. As J. Ickiewicz claims, the option of increasing the nominal value of current shares is in practice used by only a very few companies, mainly those which have a small number of shareholders. Hence, the common method of ordinary share capital increase is the issuance of new shares (Ickiewicz 2004, p. 98). Acquisition of such shares can be effected through:

1. Submission of an offer by a company and its acceptance by a specific addressee: acceptance of an offer must be in writing under pain of nullity (private subscription);
2. Offering shares only to shareholders with pre-emptive rights (closed subscription);
3. Offering shares through an announcement to persons without pre-emptive rights (open subscription).

Another method of share capital increase is a conditional increase, which must be accepted at the shareholders' annual general meeting. Under the Polish regulations a decision to use this form of share capital increase can be used to

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accomplish such goals as granting rights for the acquisition of shares to bondholders through convertible bonds or pre-emptive bonds, granting employees, board members or the board of supervisors rights to acquire shares in exchange for nonmaterial contributions that are company liabilities they have in return for rights to shares in a company's or subsidiary's profits, or by granting the rights for share acquisition to owners of subscription warrants. Under German law, conditional share capital increases are reserved for the following cases: offering creditors a right to purchase shares arising from a loan or issuance of convertible bonds into shares, planned merger, and execution of the right to acquire shares granted to employees and paid from their guaranteed profit share.

The third method of share capital increase can be introduced on the basis of authorized share capital. Use of this method facilitates the process of share capital increase as it takes a simplified form. The basis for its application is a decision of the company board which cannot be contested. According to the Commercial Companies Code, share capital increase in the mode of authorized share capital relies on granting empowerment to the board, for a maximum three-year period, to implement a share capital increase. It should be stressed that the size of authorized capital cannot exceed three quarters of the share capital on the day of granting the empowerment to the board (Kidyba 2010, *Kodeks spółek handlowych: objaśnienia*, p. 691). In German companies the board can receive such an empowerment for five years, but the degree of authorization amounts to a maximum of 50% of the value of current share capital.

The fourth specific method of share capital increase is based exclusively on internal transformations of equity structure. This is a share capital increase from a company's own resources, alternately described as "capitalization of reserves" (Skawiańczyk 1999; Skowroński, Świrski 2009; Szajkowski, Tarska 2005, p. 565), "internal capitalization" (Kidyba 2010, *Kodeks spółek handlowych. Komentarz*, pp.784-786) or "capitalization issue".[2] In the German literature it is specified, as has been already mentioned, as a nominal increase of share capital.

In the Polish and German legal regulations, increasing share capital from a company's own resources is based on changing the equity structure by transferring spare capital and/or reserve capital obtained from profits into share capital. This kind of increase exists only "on paper", i.e. the value of a company's assets does not increase as a result of this transformation. Capitalization of reserves can be effected either by increasing the number of shares or increasing the nominal value of shares i.e. through, so-called "re-nomination" (Czechowska 2000, p. 59). The first case includes new shares without the necessity of adding resources to the

[2] Capitalization issue – i.e. bonus issue – compare: Davies (1993), pp. 123-129.

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company, thus, these shares are called "bonus shares" or a so-called "bonus increase" (Kidyba 2010, *Kodeks spółek handlowych: objaśnienia*, p. 689).

Joint-stock companies that have a number of methods of increasing share capital available must analyse them thoroughly, not only in terms of meeting specific legal requirements but also taking into account their economic goals and the projected functions the increased share capital will serve, in light of an optimum strategy of financing business operations.

3. Strategies of increasing share capital in joint-stock companies

The functions and goals of increased share capital arise from both the general functions performed by this capital as well as those that may refer to expanding or maintaining a company's economic activity. As far as the former are concerned, it should be pointed that increased share capital strengthens mostly the legal, economic and guarantee function of capital (Sajnóg, Duraj 2013, pp. 287-293; Ostaszewski, Cicirko 2005, p. 93; Ickiewicz 2004, pp. 42-44; Woźniak-Sobczak 2005, pp. 2-35). Moreover, increased capital can perform other, additional functions, e.g. development, restructuring, stimulation, credit, and stabilization and marketing functions (Sajnóg 2013, pp. 59-63). **Undeniably, the process chosen for increasing capital reflects the specific strategies of joint-stock companies, which focus not only on strengthening the legal-guarantee function, but mainly the economic one.**

Research presented in the Polish and German literature observes that joint-stock companies, when increasing the value of share capital, take into consideration various strategic goals. These include, among others:

1. Financing intensive and extensive enterprise developments (increase in efficiency, expansion of a company's operations, modernization, increase of production capacity, financing modern technological solutions, etc.),
2. Reorganization and rationalization of activities oriented at lowering costs and increasing the quality and efficiency of investment and financial transactions,
3. Changing the structure and character of capital ownership in financing business activity,
4. Changing the capital structure in order to gain optimal rate of return from investment and capital costs,
5. Increasing an enterprise's financial liquidity (source of debt repayment),
6. Increasing the guarantee basis and improving creditworthiness,
7. Execution of a previously granted right to receive employee shares,

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8. Carrying out a merger, consolidation, or the acquisition of other enterprises,
9. Stock market floatation,
10. Implementation of a company's statutory provisions (Ludwig et al. 2007, p. 57; Ickiewicz 1996, p. 66).

It seems apparent that the aim of effectively increasing share capital is the desire to obtain means for the implementation of economic plans. The ordinary increase of share capital is most often applied in order to receive additional financial means which may be required for financing investments, reorganization and rationalization actions, as well as increasing the guarantee base. In the light of our conducted empirical study, the goals of ordinary increases of share capital focus mainly on capital and material investments which result from a specific strategy of company development that includes mostly expansion of a company's activity or acquiring another enterprise. Moreover, companies aiming to strengthen guarantee-stabilization functions most often mention: covering liabilities, improvement of liquidity, regaining financial stability (Sajnóg 2013, pp. 73-75).

It can be generally claimed that the primary aim of transforming the equity structure via capitalization of reserves is the necessity of increasing a company's credibility among shareholders and other groups of stakeholders. Furthermore, a share capital increase without an increase of financial means in a company can also be undertaken in order to, e.g., link the capital and a company more strongly, cope with problems with share sales or a decline in share prices on the market, or issue shares to shareholders instead of a dividend (Sajnóg 2012, pp. 485-486). Shareholders who resign from receiving current income and decide to retain a part, or even the whole of generated profit in a company expect that such steps will increase a company's standing and ensure a high level of efficiency.

Regardless of the forms and methods of increasing share capital it can be assumed that positive changes in share capital value can be correlated with an increase of economic efficiency, which meets the owners' expectations. Thus, there is a need to introduce changes in the value of share capital to achieve better return on equity and multiply the value of invested capital in an enterprise.

In order to formulate and accomplish a specific analysis of the strategies involving share capital increases in financing a company's total assets in order to improve return on equity, the degree of financing total assets through share capital can be calculated by means of the following formula:

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$$SCTA = SC/TA \times 100, \quad (1)$$

where:

$SCTA$– share capital to total assets ratio (financing total assets through share capital ratio),

SC– share capital,

TA– total assets.

The strategy of ordinary share capital increases induces not only changes in the capital structure, but also influences the volume of forecast cash flows. Thus, the announcement of a share issue itself, according to the signalling theory, can in a very short time exert a positive influence on shaping share prices in the capital market. Conversely, the long-term reactions of investors can bring about an adverse growth of equity value through the issuance of new shares in the form of so-called "dilution of capital". This is the case when an increase in the number of shares is not accompanied by a proportionate growth of profits generated by a company. This may lead to a decline in the values of return ratios, and as a consequence exacerbate an enterprise's overall financial situation.

In order to assess these kinds of effects a measure must be used for pointing out unit value of enterprise equity per share. Also net book value per share can be used for the purpose of this study, and has been determined as a ratio of equity dilution. It is expressed by the following formula:

$$BVPS = E/NS, \quad (2)$$

where:

$BVPS$– book value per share ratio (equity dilution ratio),

E– equity,

NS– number of shares.

This ratio is extremely useful for the evaluation of company's value. It reflects not only the potential of a company's appreciation, but also the rate of return from a given capital. Moreover, it shows:

- the degree of capital dispersion among shareholders,
- the price that must be paid for one zloty of liquidated company assets which would have been divided among its owners.

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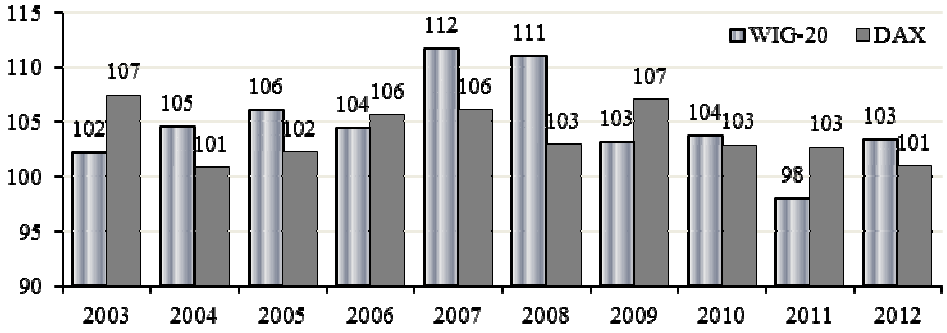
4. The results of the study on the changes in share capital value of the companies fromWIG-20 and DAX indices

The results of the empirical studies undertaken confirmed the changes in the book value of share capital in Polish and German joint-stock companies in the period between 2003-2012. This is indicated by calculated average ratios of share capital dynamics.

Figure 1. Mean values of ratios of share capital value dynamics in companies from WIG-20 and DAX indices between 2003-2012 (previous year = 100)



Source: own study on the basis of data from the Notoria Serwis S.A. database, stock market bulletins, as well as from the Polish and German stock market websites.

The figures presented in Figure 1 show that in the examined decade the biggest positive changes of share capital value in companies in the WIG-20 occurred between 2007-2008, when the share capital of examined companies increased on average by 11-12%. Less visible changes in the value of capital were observed in companies in the DAX index. The highest calculated average values of this capital dynamics (in 2003, 2006, 2007, 2009) showed only a 6-7% increase of share capital book value in relation to the previous year.

The detailed analysis of individual specific financial statements of examined companies between 2003-2012 also showed that a few units, in their financing strategies, focused on maintaining share capital at the same level. Taking into consideration all examined years and companies it should be noted that three companies from WIG-20 (KGHM, PZU, TP) and two from the DAX index (BASF, ThyssenKrupp) did not take any decisions to increase share capital.

The results of our research presented in Table 2 confirm that the proportion of share capital in total assets in the Polish companies was generally higher than in the German companies. This is supported by calculated mean values of ratios of share capital's proportion in financing total assets. Moreover, in the units included in the WIG-20 index, two research sub-periods were observed

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(between 2003-2006 and 2007-2012), in which the examined relations showed a declining trend. On the other hand, companies from the DAX index implemented a strategy of greater stability in financing total assets with share capital. The mean values of ratios of share capital's proportion in financing total assets amounted to 3-4%.

Table 2. Mean values of ratios of financing total assets through share capital (SCTA) and equity dilution (BVPS) in companies from WIG-20 and DAX between 2003-2012

Ratios	Companies	Years									
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SCTA	WIG-20	9.4%	9.0%	7.4%	7.0%	11.1%	10.2%	9.8%	9.5%	6.9%	6.6%
	DAX	4.0%	3.9%	3.6%	3.3%	3.1%	3.2%	4.1%	3.7%	3.5%	3.5%
BVPS	WIG-20	26.0	29.2	25.1	59.3	133.5	86.0	58.8	70.7	52.1	57.1
	DAX	26.9	29.0	34.0	36.4	36.0	33.4	33.7	38.2	40.1	43.6

Source: own study on the basis of data from the Notoria Serwis S.A. database, stock market bulletins, as well as from the Polish and German stock market websites.

When analyzing calculated ratios of equity dilution in the examined decade it can be said that their values were diverse. Similarly as with ratios of share capital's proportion in financing total assets, greater stability was observed in companies from the German trading floor. It must be noted that in spite of increases or declines in share capital's proportion in financing assets of analysed companies, no proportionate growth or decline in the value of equity per share was observed. On the whole, the convergence of changes in values of SCTA and BVPS was noted in the following companies:

- from the WIG-20 index in 2005 and between 2007-2009, as well as in 2011, whereas
- from the DAX index only in 2007, 2009 and 2012.

The examined Polish companies in the research period used only effective share capital increases, without the possibility of using authorized share capital. None of the units engaged in capitalization of reserves (see Table 3). Moreover, among the methods of effective share capital increase the prevalent type was conditioned capital. This was generated as a result of granting the right to share acquisition to employees and/or board members. Share acquisition in the mode of an ordinary share capital increase proceeded mainly through an offer made by the company to a specific addressee (private subscription).

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Table 3. Methods of increasing share capital in the companies from the WIG-20 and DAX indices between 2003-2012

Methods of increasing share capital		WIG-20		DAX	
		Number of AGM* decisions	Position on priority list	Number of AGM* decisions	Position on priority list
Ordinary	Private subscription	13	2	10	4
	Closed subscription	5	4	12	2
	Open subscription	8	3	1	8
Conditional	Employee options	24	1	40	1
	Convertible bonds	5	4	3	6
	Subscription warrants	1	5	2	7
Authorized share capital		–	–	11	3
Capitalization of reserves		–	–	7	5

*AGM – annual general meeting, also known as the annual meeting or shareholder's general meeting.

Source: same as in Table 2.

In the examined German public companies all four methods of increasing share capital were used in the analysed period, including capitalization of reserves and authorized share capital. The prevalent method was the conditional increase, which was noted in nearly 56% of resolutions passed at the annual general meeting (AGM). It must also be stressed that a prevalent number of companies from the DAX index (similarly to companies from WIG-20) used employee share offers. With respect to ordinary share capital increases, the shares were offered mainly through closed and private subscription.

5. Analysis of the economic efficiency of Polish and German joint-stock companies that increased share capital

It can be assumed that the choice of the specific form and method of increasing share capital depends on a number of factors/determinants aimed at achieving high economic efficiency for a company. It can be observed that such efficiency shows a different sensitivity to nominal and effective share capital increases. This observation is of great importance in the practice of strategic management of listed companies' equity.

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One tool that enables one to calculate, in a synthetic way, measures of economic efficiency is, among others, DEA – Data Envelopment Analysis.[3] The efficiency ratio measured by this method can be described as a quotient of the weighted sum of inputs (Dyckhoff, Allen, pp. 411-436):

$$e = \left(\sum_{r=1}^{s} \mu_r \times Y_r\right) / \left(\sum_{i=1}^{m} v_i \times X_i\right) \tag{3}$$

where:

e– measure of efficiency,
s– number of outputs,
m– number of inputs,
μ_r– weights describing significance of individual outputs,
v_i– weights describing significance of individual inputs.

It is noted in the economic literature that the DEA method does not require previous knowledge of weights which determine the significance of individual outlays and effects, as in the course of calculations weights maximizing the efficiency of each object are generated.[4] Depending on the purpose of the analysis and assumed research assumptions, the DEA method offers an opportunity to calculate three forms of efficiency measures i.e. input-oriented efficiency, output-oriented efficiency, and efficiency without orientation. Moreover, there is the possibility to estimate efficiency measures in three categories: constant economies of scale, changeable economies of scale, and non-growing economies of scale (Banker et al. 1984, pp. 92-1078; Fäare et al. 1985; Kleine 2002, p. 210).

For the needs of this study a variant oriented at inputs with constant economies of scale was applied. The choice of such a model was influenced by the research problem i.e. the assessment of company efficiency in terms of minimizing individual inputs (factors determining economic efficiency). As the outputs, classical measures of unit returns were adopted (sales, total assets and

[3] In the Polish literature the DEA method is known as the frontier analysis method or data envelopment analysis. It must be stressed that there are numerous publications in which the DEA method was applied to assess the efficiency of various entities e.g. power houses, hospitals, insurance companies, colleges, farms, joint-stock companies, industry sectors; or to evaluate efficiency of investment on the capital market. This method is most commonly used in the banking sector. Compare: Varmaz (2006), p. 235; Rogowski (1996), p. 4-48; Feruś (2006); Hülsmann, Peters (2007).

[4] In the DEA method the units are described as decision making units (DMU), whereas the subject of the analysis is the efficiency with which a specific DMU transforms inputs into specific outputs.

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equity), whereas inputs were ratios of share capital dynamics, financing total assets with share capital, and equity dilution (see Table 4).[5]

Table 4. Inputs and outputs in the DEA model

Forms of increasing share capital	Methods of increasing share capital	Inputs	Outputs
Effective	Ordinary	ΔSC, $SCTA$, $BVPS$	ROS, $ROTA$, ROE
	Conditional		
	Authorized share capital		
Nominal	Capitalization of reserves		

Source: own study.

In analyzing the calculated measures of efficiency of examined companies it must be pointed out that there are significant differences between units included in the WIG-20 and DAX indices. First of all, it can be said that in the analysed decade a much higher efficiency of sales was observed in the Polish companies than in the German ones. This is confirmed by mean values of return ratios in Polish companies, which were several, and in some cases even several dozen percentage points higher than in the companies from the German trading floor (see Table 5). What is especially worth noting here are the deviations between 2008-2009 (sometimes described as the period of economic downturn or crisis)[6], in which companies from WIG-20 achieved a higher return on sales, whereas companies from the DAX index experienced the opposite.

Table 5. Mean values of return on sales (ROS), return on total assets (ROTA) and return on equity (ROE) in companies from WIG-20 and DAX indices between 2003-2012 (in %)

Ratios	Companies /indices	Years									
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
ROS	WIG-20	8.0	12.6	16.8	18.8	20.3	22.2	23.8	26.0	17.1	18.5
	DAX	1.7	5.3	6.3	7.8	9.5	3.4	0.5	7.2	7.8	6.1
ROTA	WIG-20	3.1	6.0	6.7	7.7	7.5	4.9	5.2	6.7	6.0	7.5
	DAX	1.6	4.0	4.2	5.3	5.5	3.1	1.3	4.2	4.4	3.7
ROE	WIG-20	8.0	13.1	16.0	17.0	18.7	13.2	12.5	14.8	13.7	16.3
	DAX	5.0	13.7	14.3	17.9	18.7	8.6	4.2	14.0	13.0	9.8

Source: same as in Table 2.

[5] What must be stressed here is the contractual character of the notions “inputs” and “outputs”. As far as connection of the term “output” with returns is justified in this study, the term “inputs”, which usually refers to costs, is used only to perform the role of customary terminology used in the terminology of DEA method.

[6] The situation in the financial markets that emerged in 2007 is compared to the Great Depression from the period between 1929-1933. Compare: Dach (2011), pp. 33-36.

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Empirical research into the return on total assets ratios indicates the existence of significant differences between the Polish and German enterprises. It must be pointed out that in the companies from WIG-20 mean values of the analysed ratios were a few percentage points higher than in the companies from DAX index. Thus the results of the study confirm a higher economic efficiency of Polish units in terms of using total assets in their operations. What seems extremely interesting here is the similar trend in return on assets in the entire analysed period on both trading floors (see Table 5).

Calculated mean values of return on equity in the companies from WIG-20 index were definitely higher than in the German companies (the only exceptions were the values achieved in 2004 and 2006). The analysis of return on equity in the Polish and German entities in the analysed decade allows one to differentiate three sub-periods:

1. The period between 2003-2007, in which return on equity showed a positive trend,
2. The period between 2008-2009, in which companies achieved definitely lower financial results in relation to equity, and
3. The period between 2010-2012 which was characterized by a higher return of equity than in the previous sub-period; however the changes were diversified in character; the latest analysed research period is worth noting, as a reversal in the trend of changes then appeared.

The observation of changes in the volume of return on sales, total assets and equity ratios allows one to claim that the Polish companies, in a majority of cases, achieved a greater economic efficiency in the analysed decade than the German companies examined. In case of the latter, the major problems in achieving profitability were observed in the period between 2008-2009. It seems that companies from WIG-20 experienced to a lesser extent the negative effect of the collapse in capital markets and the global recession at this time. The results of research on the efficiency of companies from the DAX index confirm the hypotheses then put forward, and it may be stated that the effects of the insolvency of American institutions reached Europe immediately, especially Germany.[7]

The results of the analysis of efficiency measures in those companies increasing share capital,[8] calculated by means of DEA Frontier[9] for the

[7] Compare: *Niemcy w obliczu kryzysu finansowego w USA*, www.dw-world.de (access 14.09.2013); *Kryzys finansowy objął Europę*, www.wprost.pl (access 14.09.2013).

[8] The companies that were excluded from the analysis were those that between 2003-2012 maintained share capital on the same level i.e. three enterprises from the WIG-20 (KGHM, PZU, TP) and two from DAX (BASF, ThyssenKrupp).

[9] Free version available on the website within the study: W.D. Cook, J. Zhu, *Data Envelopment Analysis: Modeling Operational Processes and Measuring Productivity*, 2008.

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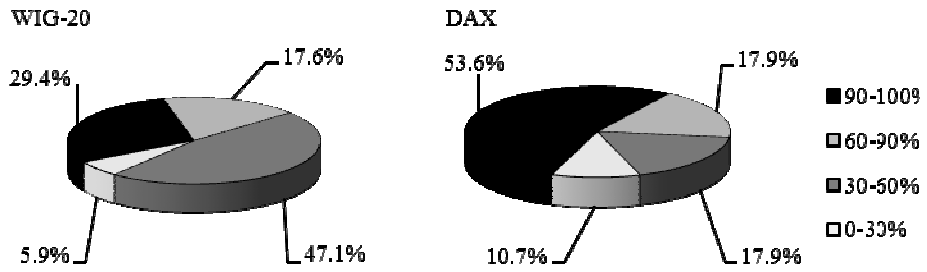
examined ten periods (i.e. each of the years between 2003-2012)[10] indicated that nearly 30% of companies from the WIG-20 index showed efficiency on the level of 90-100%, based on the assumption that "outputs" took the form of return on sales, total assets, and equity, and that "inputs" took the form of indicators of share capital dynamics, financing total capital with share capital and equity dilution[11] (see Figure 2). High values in efficiency measures were noted in more than 50% of the companies from DAX index. Significant differences between the Polish and German entities were visible also in reference to the DEA measures indicating companies' lower efficiency (30-60%).

Figure 2. The structure of analysed companies from the WIG-20 and DAX indices based on their efficiency between 2003-2012



Source: same as in Figure 1.

A detailed analysis of the examined entities from the WIG-20 index indicates that the highest efficiency was noted in three joint stock companies: Eurocash, GTC, and Kernel (see Table 6). The measures of efficiency in their cases were at the level of 100%. Equally high efficiency, from the point of view of DEA (nearly 100%), was observed in two companies: Pekao and PGNiG. On the other hand, the lowest degree of efficient use of opportunities for increasing share capital was observed in the case of PGE, for which the efficiency measure amounted to only 6%.

When making an attempt to differentiate the efficiency of companies from the WIG-20 index with respect to the methods applied to increase share capital, it must be said that no significant dependence between these variables was

[10] Specific efficiency measures were calculated on the basis of mean values of specific inputs and outputs for the period between 2003-2012.

[11] Taking into consideration the constraints of the DEA method (positive values of inputs and outputs), negative values of specific inputs and outputs were replaced by a zero value. Compare: Feruś (2006), p. 50.

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observed. High efficiency from the point of view of DEA was achieved by the companies that, in the analysed period, took a decision to increase ordinary share capital as well as those which chose a conditional increase.

Table 6. Mean values of efficiency of analysed companies from the WIG-20 index and the methods of increasing share capital between 2003-2012

Joint-stock companies	DEA measures	Number of AGM decisions in the division into methods of increasing share capital			
		Ordinary	Conditional	Authorized share capital	Capitalization of reserves
Asseco Poland	0.39	6	1	–	–
Bogdanka	0.34	1	–	–	–
BRE Bank	0.44	2	8	–	–
BZ WBK	0.70	1	1	–	–
Eurocash	1.00	1	7	–	–
Grupa Lotos	0.48	2	–	–	–
GTC	1.00	3	2	–	–
Handlowy	0.49	–	1	–	–
JSW	0.43	1	–	–	–
Kernel	1.00	3	–	–	–
Pekao	0.97	–	9	–	–
PGE	0.06	2	1	–	–
PGNiG	0.91	1	–	–	–
PKN Orlen	0.47	–	2	–	–
PKO BP	0.81	1	–	–	–
Synthos	0.78	1	–	–	–
Tauron	0.37	1	1	–	–

Source: same as in Table 2.

As an example, we can examine companies with 100% efficiency i.e. Eurocash and Kernel. In the former the strategy of share capital increase focused mainly on offering shares to employees within a so-called managerial offer, i.e. a conditioned method of increasing capital. On the other hand, in Kernel strategic decisions concerning capital increase were oriented at offering shares through advertisement aimed at people who did not have pre-emptive rights (open subscription). It must be stressed that companies with a high degree of efficiency (DEA measures higher than 0.9) mostly chose a conditioned share capital increase. This was the case in 76% of the companies.

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Table 7. Mean measures of efficiency in the analysed companies from the DAX index and the methods of increasing their share capital between 2003-2012

Joint-stock companies	DEA measures	Number of AGM decisions in the division into methods of increasing share capital			
		Ordinary	Conditional	Authorized share capital	Capitalization of reserves
Adidas	1.00	–	5	–	1
Allianz	1.00	3	10	–	–
BAYER	0.50	–	1	1	
Beiersdorf	1.00	–	–	–	1
BMW	1.00	–	2	–	–
Commerzbank	0.04	3	5	–	–
Continental	0.60	3	5	–	–
Daimler	0.38	5	8	–	–
Deutsche Bank	1.00	1	5	2	–
Deutsche Börse	1.00	–	–	–	1
Deutsche Lufthansa	0.36	2	2	–	–
Deutsche Post	0.68	–	4	–	–
Deutsche Telekom	0.17	3	–	–	–
E.ON	0.83	1	–	–	–
Fresenius	1.00	7	4	1	1
Fresenius Medical Care	1.00	5	2		1
HeidelbergCement	0.72	1	1	5	2
Henkel	1.00	–	–	–	1
Infineon Technologies	0.00	1	2	–	–
K+S	1.00	2	–	–	–
LANXESS	0.36	1	–	1	–
Linde	1.00	1	8	1	–
Merck	1.00	1	3	–	–
MünchenerRück	0.43	1	1	–	–
RWE	1.00	–	–	1	–
SAP	1.00	1	6	1	1
Siemens	0.66	–	2	–	–
Volkswagen	1.00	–	5	–	–

Source: same as in Table 2.

A significant diversification between methods of share capital increase and calculated measures of efficiency was observed in the case of Polish companies with a low or moderate degree of efficiency. In enterprises in which

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DEA measures were below 0.9, more than a half of AGM decisions chose to employ an ordinary share capital increase, whereas the others chose a conditioned form. On the other hand, PGE, in which the least efficiency was observed, when making three strategic decisions on increasing share capital twice chose an ordinary mode, including both open and private subscription.

In analysing the entities from the DAX index, it should be noted that in the analysed decade one hundred percent efficiency in increasing share capital was achieved by 15 companies (see Table 7).

Three German companies proved to be inefficient from the DEA point of view: Commerzbank, Deutsche Telekom and Infineon Technologies. In the latter case, as it experienced unprofitability in many analysed periods the calculated measures of efficiency showed zero efficiency of increasing share capital in relation to achieved returns. When assessing the influence of the method of share capital increase on efficiency in companies from the DAX index, it should be noted that in those entities with one hundred percent efficiency, the strategies of increasing share capital were diversified. However, it should also be stressed here is that the most prevalent decisions concerned a conditional capital increase, which was the case in 60% of entities. Strategic decisions in this area focused mainly on offering shares to employees that were paid from their due share in profits.

A conditional increase (also based on employee share schemes) was prevalent among companies with moderate or low efficiency. They did not use capitalization of reserves, inasmuch as the strategy of increasing share capital from a company's own resources was used in those companies with efficiency higher than 60%. However, the least efficient entities from the DEA point of view took decisions about both ordinary share capital increases (mostly in the form of private subscription) and conditional increases. This form of target capital was chosen by the most of companies with efficiency on the level between 60-90%.

6. Conclusions

The analysis of the degree of efficiency diversification in public joint-stock companies that increased their share capital allows one to state that in the analysed period 2003-2012 the companies listed on the Warsaw Stock Exchange and the Frankfurt Stock Exchange implemented diverse financial strategies. However, a certain regularity in the choice of specific methods of share capital increase, as well as shaping their economic efficiency, can be noted.

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Taking into consideration all the analysed periods, attention should be drawn to the less significant changes in the book value of share capital in the companies from DAX index than in the companies from WIG-20 index. Moreover, the proportion of share capital in total assets in the Polish companies proved to be higher than in the German ones. Analogical conclusions can be drawn based on an analysis of ratios of equity dilution, which confirmed a greater stability of share capital in the companies from the German trading floor. In spite of this, the analysed relations pointing toward a strategy for shaping share capital in companies from the WIG-20 and DAX indices turned out to be convergent in many analysed periods.

Contrary to the German companies, the Polish entities did not use authorized share capital and capitalization of reserves. They based their financial strategies solely on the methods for effective increasing of share capital. It must be noted that among the companies listed on the Polish and German stock exchanges, the form that prevailed was a conditional share capital increase, especially within employee share schemes. On the other hand, ordinary capital increases were implemented mainly through private or closed subscription.

In both the Polish and German analysed enterprises no explicit impact of the methods for increasing share capital on the economic efficiency achieved was observed. It should also be noted that companies from the WIG-20 index generated, in the examined decade, much higher returns on sales, equity or total assets than companies from DAX index. However, among the latter there were more cases in which DEA measures of efficiency were equal to 1, which attests to the highest degree of using share capital increase in relation to achieved returns. Based on a detailed analysis of the interdependence between methods of increasing book value of share capital in the analysed companies and economic efficiency, measured by the DEA method, it must be noted that the choice of form of capital increase does not differentiate in a clear way the entities' efficiency. The presented empirical research findings thus do not recognize the assumed hypothesis as fully confirmed.

It is worth pointing out that the conducted empirical research refers only to public companies from specific indices, and based on its limited scope and the selected time period, it does not aspire to formulate general conclusions. The findings are just partial evidence that there is some diversified impact of changes in financial strategy on the degree of the efficiency of the Polish and German joint stock companies.

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Streszczenie

STRATEGIE PODWYŻSZANIA KAPITAŁU ZAKŁADOWEGO A EFEKTYWNOŚĆ SPÓŁEK GIEŁDOWYCH – POLSKO-NIEMIECKIE STUDIUM ANALITYCZNO-PORÓWNAWCZE

Wiodącym nurtem badań teoretyczno-empirycznych zaprezentowanych podjętych w opracowaniu stanowi porównawcza analiza wpływu określonych strategii kształtowania kapitału zakładowego na efektywność ekonomiczną spółek notowanych na polskim i niemieckim rynku kapitałowym. Przedstawiony problem badawczy realizowany jest w trzech częściach. Rozważania zawarte w części pierwszej zawierają ocenę możliwych powiązań efektywności działania przedsiębiorstwa z procesem podwyższania kapitału zakładowego. W części drugiej znajdują się wyniki badań empirycznych nad zmianami kapitału zakładowego badanych spółek wchodzących w skład indeksu WIG-20 oraz DAX, zaś część trzecia zawiera wyniki badań ich efektywności w kontekście wykorzystywanych metod podwyższania kapitału zakładowego.

Ocena efektywności publicznych spółek giełdowych została przeprowadzona za pomocą nieparametrycznej metody DEA, z wykorzystaniem miar zorientowanych na nakłady oraz stałych efektów skali. Za efekty(wyniki) przyjęto współczynniki rentowności sprzedaży, kapitału własnego oraz aktywów całkowitych, zaś za nakłady uznano wskaźniki dynamiki kapitału zakładowego, sfinansowania majątku całkowitego kapitałem zakładowym oraz rozwodnienia kapitału własnego.

***Słowa kluczowe**: kapitał zakładowy, podwyższanie kapitału zakładowego, efektywność, polskie i niemieckie spółki akcyjne*

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