

THE INFLUENCE OF MICROECONOMIC FACTORS ON INVESTMENT EXTERNAL FINANCING IN POLISH QUOTED METALS COMPANIES

³JUSTYNA ZYGMUNT

*Opole University of Technology, Faculty of Economy and Management, ul. Waryńskiego 4, 45-047 Opole, Poland
email: "j.zygmunt@po.opole.pl"*

The company's abilities to finance the investment from external capital are conditioned by heterogeneous factors. In this paper the research attention was concentrated on microeconomic factors, as those elements which might be dependent on the company's decisions. The principal purpose of this paper was to define the impact of microeconomic factors on external financing of investment in Polish quoted metals companies in period 1997-2010. Research expectations, as well as the empirical verification was based on the pecking order theory. Results obtained confirmed the thesis of microeconomic factors' relevance on investment's external financing in Polish quoted metals companies.

Keywords: investment external financing, microeconomic factors, quoted metals companies, pecking order theory

1 Introduction

Investment activity is determined to a large extent by the financial resources which are at the company's disposal and also might be gained from various capital sources. The process of covering financial needs connected with investment requires the capital engagement on the level which generally surpasses the company self-financing abilities. It usually involves the necessity of external capital usage. The investment significance in the company's development determines in the context above the importance of issues connected with investment's external financing, which consequently should be considered as one of the essential part of the company value growth. It should be emphasized at the same time that the company's abilities to finance the investment from external capital are conditioned by heterogeneous factors, inter alia microeconomic.

Particular investment position in the company implies the importance of researches related to the microeconomic factors identification, as well as the recognition both the strength and the direction of their influence on investment's external financing. Hence, in this paper, the principal goal was to define the impact of microeconomic factors on external financing of investment, on the basis of Polish quoted metals companies. Theoretical research considerations, as well as empirical were based on the pecking order theory, which was created by Myers and Majluf (1984). According to the theory in question, in the conditions of information asymmetry which exists on imperfect financial market, the company intends to reduce the investment inefficiency by the selection of capital in determined order¹. It states that the company first of all prefers internal capital, but in the necessity of external capital usage, the company prefers credits and bonds issues to shares issues. The confirmation of these thesis was obtained in many empirical studies which were conducted, among others by Shapiro (1990)², Rajan and Zingales (1995)³, Harris and Raviv (1991)⁴, Gajdka (2002)⁵, Zygmunt (2009)⁶.

¹ See more: Myers S.C., Majluf, N. *Corporate Financing and Investment. When Firms Have Information that Investors Do Not Have*. "Journal of Financial Economics", vol. 13, 1984, 187-221 p. ISSN: 0304-405X.

² See more: Shapiro, A.C. *Modern Corporate Finance*. New York: Mcmillan Publishing Company, 1990. 484 p. ISBN 0024095303.

³ See more: Rajan, R.G., Zingales, L. *What do we know about capital structure? Some evidence from international data*. "Journal of Finance", vol. 50, 1995. 1421-1460 p. ISSN 1540-6261.

⁴ See more: Harris, M., Raviv, A. *The theory of capital structure*. "Journal of Finance", vol. 46, 1991. 297-355 p. ISSN 1540-6261.

⁵ See more: Gajdka, J. *Teoria struktury kapitału i ich aplikacja w warunkach polskich*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 2002. 230-248 p. ISBN 8371715803.

⁶ See more: Zygmunt, J. *Polish companies financing in consideration of the pecking order theory* [in:] scientific editor: Dytczak, M., *The prospects of scientific and economic collaboration European Union and China in XXI century. Multi- aspect cooperation the European Union and China, Studia i Monografie*. Z. 249, Opole: Oficyna Wydawnicza Politechniki Opolskiej, 2009. 147-152 p. ISBN 978-83-60691-64-9.

2 Microeconomic factors of investment external financing – identification and research expectations

The investment financing might be sensitive to microeconomic factors. Both the strength and the range of above-mentioned factors on investment's external financing are generally dependent on the decisions which are made in the company. On the basis of theoretical studies results, it should be indicated that first of all the most common microeconomic factors are: the possibility to financial leverage effects usage, the company size and its market position, as well as the company's financial standing⁷. Besides, in the light of considerations conducted in this paper, it appears relevant to include into the microeconomic factors such elements as the investment's activity scale and the company's growth potential.

The impact of microeconomic factors on investment's external financing might be diverse. In this paper, the research expectations were expressed on the basis of the pecking order theory and are described as follows:

In accordance to the pecking order theory, the absence of entire substitution between external and internal financing is reflected in the preference of capital which originated from internal sources⁸. From this point of view, it might be expected that the company will not entirely benefit from the financial leverage effects which display in increasing the return on equity as the consequence of external capital usage⁹. Moreover, as emphasize Hamrol and Filipczyk (2004), the essential influence of financial leverage on the company flexibility is noticeable in larger companies in a low level of this leverage¹⁰. Thereby, it might be anticipated that the decrease in financial leverage effects is accompanied by the decrease in the scope of investment's external financing.

It should be also remarked that the researches conducted, among others, by Rajan and Zingales (1995) lead to the conclusion that the information asymmetry level is higher in larger companies¹¹. On the base of the pecking order theory, it should be notified that the increase of information asymmetry entails the intensification of internal capital usage in the company's financial structure. Therefore, it might be assumed that the company's size growth will be connected with decreasing in the range of investment's external financing.

Taking the company's market position into consideration it should be said, that its high position is often conducive to external capital gaining. At the same time, it should be remarked that the company's activities directed to market expansion express usually the necessity of various investment realization, what might imply the need to capital involvement on the level which surpasses the company self-financing abilities. In this context it is assumed that the increase in the company's market position corresponds with higher level of investment's external financing.

⁷ See more among others: Rutkowski, A. *Zarządzanie finansami*. Warszawa: Polskie Wydawnictwo Ekonomiczne, 2000. 241-243 p. ISBN 832081278X; Szczepankowski, P.J. *Zarządzanie finansami przedsiębiorstwa*. Warszawa: Wydawnictwo Wyższej Szkoły Przedsiębiorczości i Zarządzania im. Leona Koźmińskiego, 2004. 92-95 p. ISBN 8389437171; Zygmunt, A., *Determinanty struktury kapitału przedsiębiorstw należących do branży przemysłu elektromaszynowego (w świetle badań empirycznych* [in:] scientific editor Kopiński, A., *Finanse przedsiębiorstw*. Wrocław: Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu nr 98, 2010. 442-448 p. ISBN 978-83-7695-001-3; Norton, E. *Factors Affecting Capital Structure Decisions*. "Financial Review", vol. 26(3), 1991. 431-446 p. ISSN 1540-6288.

⁸ Myers, S.C., Majluf, N. *Corporate Financing and Investment. When Firms Have Information that Investors Do Not Have*. "Journal of Financial Economics", vol. 13, 1984, 187-221 p. ISSN: 0304-405X.

⁹ With the exception of share capital.

¹⁰ Hamrol, M., Filipczyk, A. *Czynniki determinujące strukturę kapitału przedsiębiorstwa. Teoria i praktyka*, [in:] scientific editor: Zarzecki, D. *Zarządzanie finansami przedsiębiorstw w Unii Europejskiej*, tom I. Szczecin: Fundacja na rzecz Uniwersytetu Szczecińskiego, 2004. 253 p. ISBN 8389142252.

¹¹ Rajan, R.G., Zingales L. *What do we know about capital structure? Some evidence from international data*. "Journal of Finance", vol. 50, 1995. 1421-1460 p. ISSN 1540-6261.

On the grounds of the pecking order theory, it should be enhanced that the company's good financial standing might be the principal premise of investment's needs covering from internal capital, which may allow to reduce the information asymmetry. Above conclusion was verified inter alia by Shapiro (1990), Gajdka (2002), Skowroński (2002)¹², who on the base of profitability criterion concluded that companies with good financing standing generally use internal capital. For that reason it is expected that the company's good financial standing involves the smaller external capital application in investment activities.

It should be emphasized that the realization of investment on certain size is integrally related to indispensability of capital insurance. In the situation when the company accomplishes investment on very large scope, it might be connected with accelerated request for capital, especially external. Hence, it is expected that the investment's activity scale enhancement will correspond to higher level of investment's external financing. Similarly, it is assumed that the high company's growth potential is accompanied by the increase in external financing of investment.

3 The Empirical verification of microeconomic factors influence on investment external financing

Polish metals sector includes dozen companies with almost 33 000 employees¹³. In 2010 year, the financial net result was negative with the amount of circa 132 milion PLN, and investment expenditures of 607 milion PLN¹⁴. Metals sector in Poland faces the rigorous requirements connected with environmental protection. There is said that relatively high infrastructural investment accomplishment in Poland will be the ground for metals sector development¹⁵.

The empirical research over the impact of microeconomic factors on investment's external financing were conducted on these metals companies which were continuously quoted on Warsaw Stock Exchange between the years 1997-2010. The research sample includes all the companies which fulfilled the foregoing condition and contains the following companies: Ferrum S.A., Grupa Kęty S.A., Hutmen S.A., Impexmetal S.A., Stalprodukt S.A.

Dependence description between external financing of investment and microeconomic factors was conducted on the basis of Pearson correlation coefficient. Identification of the connections between variables was carried out by the usage of the linear regression models represented as follows¹⁶:

$$Y = \alpha_0 + \alpha_1 x + \varepsilon \quad (1)$$

where:

Y – dependent variable,
 α_1 – correlation coefficient variable Y in relation to variable X,
 α_0 – intercept,
 x – independent variable,
 ε – error term.

The estimations of models' parameters were conducted by the usage of ordinary least squares method. Dependent variable (Y) represents the level of external financing of investment in polish quoted metals companies. In the process of dependent variable

definition, there was employed the pecking order theory, which indicates that the company's capital structure depends on the ways in which the investment are financing¹⁷. Hence, dependent variable was determined as the external capital contribution to the company's capital structure.

Independent variables were established on the basis of theoretical studies outcomes which were discussed previously in this paper. The company financial standing complexity implied the requirement of various variables usage to describe the standing in question. As a result, independent variables were determined as follows:

- X1 – company size (\log_e of net sales),
- X2 – company market position (ratio between net sales and total assets),
- X3 – financial leverage (ratio between return on equity and return on total capital assets),
- X4_A – return on assets (ratio between net financial result and total assets),
- X4_B – return on equity (ratio between net financial result and equity),
- X4_C – return on sales (ratio between net financial result and net sales),
- X4_D – current liquidity ratio (ratio between current assets and current liabilities),
- X4_E – cash ratio (ratio between cash flows from operating activities and current liabilities),
- X4_F – cash sufficiency for indebtedness repayment (ratio between cash flows from operating activities and total liabilities),
- X4_G – capability to debt-service (ratio between the sum of earnings before interest and tax to interest),
- X5 – company growth potential (ratio between investment expenditures and total assets),
- X6 – investment activity scale (ratio investment assets and total assets).

Preliminary tests proved the there is the evidence of strong random dependence¹⁸ between variables X4_A and X4_B, X4_A and X4_C, X4_B and X4_C, as well as between X4_E and X4_F. Relatively high multicollinearity between above variables entailed the necessity for variables exclusion (X4_A, X4_B, X4_E). Finally, definite group of independent variables includes: X1, X2, X3, X4_C, X4_D, X4_F, X4_G, X5, X6.

To identify those independent variables which are in significant relation to dependent variable, there was used the Pearson correlation coefficient. It was considered at the same time that the influence of independent variables on dependent variable might be delayed. T-Student test with n-(k+1) degrees of freedom was employed to verify the relationships significance between independent variables and dependent variable. The research results allow to conclude that¹⁹:

- variables X3, X4_D, X4_G and X5 had the highest dependence with variable Y in period t,
- for variables X2 and X4_F which were one period delayed, the Pearson correlation coefficients with variable Y were the highest,
- for two periods delay, variables X1, X4_C and X6 influenced on variable Y stronger than in period t or period t-1.

Variables X1_{t-2}, X3_t, X4_{C t-2}, X4_{D t} as well as variable X4_{F t-1} were statistical significant in relation to variable Y, and were the object of further studies over the influence of microeconomic factors on investment's external financing in polish quoted metals companies. The results of estimation both Pearson

¹² Skowroński, A. *Kształtowanie struktury kapitału jako przedmiot decyzji finansowych* [in:] scientific editor: SOBIECH, J. *Kapitałowa strategia przedsiębiorstwa*. Poznań: Wydawnictwo Akademii Ekonomicznej w Poznaniu, 2002. 59-73 p. ISBN 8388760971.

¹³ See more: *Polska 2011 raport o stanie gospodarki*. Warszawa: Ministerstwo Gospodarki, Departament Analiz i Prognoz, 2011. 153-154 p. <http://www.mg.gov.pl/files/upload/8436/RoG2011.pdf>, accessed November 20, 2011. ISSN 1429-3005.

¹⁴ See more: *Ibidem*.

¹⁵ See more: *Ibidem*.

¹⁶ Ignatczyk, W., Chromińska, M. *Statystyka: teoria i zastosowanie*. Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu, 1998. 165 p. ISBN 8372050333.

¹⁷ See more: Gajdka, J. *Teorie struktury kapitału i ich aplikacja w warunkach polskich*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 2002. 236-243 p. ISBN 8371715803.

¹⁸ When $|R| > 0.9$.

¹⁹ for further delays than two periods, the dependence strength between independent variables and dependent variable was minor or statistical insignificant.

correlation coefficients and linear regression models are shown in table 1.

Variable	R	R ²	$\hat{\alpha}_i$	t _{ei}	p-value	
X1 _{t-2}	-0.6883	0.4738	$\hat{\alpha}_0$	3.8357	3.4640	0.00608153
			$\hat{\alpha}_1$	-0.1662	-3.0007	0.01332716
X3 _t	0.7448	0.5547	$\hat{\alpha}_0$	0.3803	11.2171	0.0102*10 ⁻⁵
			$\hat{\alpha}_1$	0.0851	3.8661	0.00224371
X4C _{t-2}	-0.6218	0.3867	$\hat{\alpha}_0$	0.5466	25.3058	0.0213*10 ⁻⁸
			$\hat{\alpha}_1$	-0.5671	-2.5110	0.03086072
X4D _t	-0.7856	0.6171	$\hat{\alpha}_0$	0.6859	15.5394	0.0259*10 ⁻⁷
			$\hat{\alpha}_1$	-0.1235	-4.3981	0.0868*10 ⁻²
X4F _{t-1}	-0.8011	0.6418	$\hat{\alpha}_0$	0.5963	25.0054	0.0481*10 ⁻⁹
			$\hat{\alpha}_1$	-0.3519	-4.4398	0.0995*10 ⁻²

Table 1. Pearson correlation and linear regression estimation results. Source: own empirical studies.

The results displayed in table 1 enable to emphasize that estimated models have the reasonable adjustment to empirical data, with the exception of models related to independent variables X1_{t-2} and X4C_{t-2}, for whose coefficient of determination proved that they in relatively restrained degree explain the changeability of variable Y. The models' structural parameters significance was confirmed on the basis of t-Student test. On the basis of Durbin-Watson test it might be concluded that there was no evidence of error term's autocorrelation.

Empirical studies provide the conclusion which is consistent with the observations of Shapiro (1990), Gajdka (2002) and Skowroński (2002) concerning the company's financial standing. The studies allow to remark that financial standing of polish quoted metals companies is argued to have the important influence on the level of external financing of investment. The dependence direction is consistent with the research assumptions based on the pecking order theory and enables to indicate that good financial standing of companies in question determines the reduction of external financing of investment for the benefit of internal financing usage. According to the studies results, it should also be noticed the significant relationship between the level of external financing of investment in polish quoted metals companies and their size. Contrary to expectations, the dependence direction indicates that the company's size growth corresponds to the increase in the level of external financing of investment. Subsequently, there is meaningful dependence between the company's financial leverage and the level of external financing of investment in polish quoted metals companies. The empirical results in this field are in compliance with research assumptions and predestine to conclude that together with the financial level increase, the level of external financing of investment enlarges.

4 Conclusions

The principal goal of this paper was to define the impact of microeconomic factors on investment's external financing in polish quoted metal companies. Both theoretical and empirical research results indicate that the external financing of investment in polish quoted metals companies is conditioned by various microeconomic factors. Empirical results proved that for those companies there is the evidence of statistically significant sensitivity of investment's external financing to such

microeconomic factors as: financial leverage, company's size and financial standing. The dependence direction was diverse. The microeconomic factors were sometimes characterized by the delayed influence on investment's external financing. Moreover, it should be pointed out that the level of external capital usage to investment's needs covering in companies in question was irrespective to their market position, growth potential, and also investment's activity scale.

The investment significance in the company's development determines the necessity for further research. It appears that the subject of these studies should focus first of all on the verification if the relations occurred in quoted metals companies are coherent for those metals companies in Poland which are not quoted. It seems also important to disclose the matter of information asymmetry influence on the above mentioned relationships. Furthermore, there is the need noticeable to use panel data analysis method to examine the results obtained. Since the external investment financing of polish quoted metals companies might be determined not only by microeconomic factors, the further researches should also concentrate on the identification of macroeconomic factors which affect the financing in question, as well as such factors as for instance the managers' attitude towards financial and investment risk.

Literature:

- Gajdka, J. *Teorie struktury kapitału i ich aplikacja w warunkach polskich*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 2002. 230-248 p. ISBN 8371715803.
- Hamrol, M., Filipczyk, A. *Czynniki determinujące strukturę kapitału przedsiębiorstwa. Teoria a praktyka*, [in:] scientific editor: Zarzecki, D. *Zarządzanie finansami przedsiębiorstw w Unii Europejskiej*, tom I. Szczecin: Fundacja na rzecz Uniwersytetu Szczecińskiego, 2004. 253 p. ISBN 8389142252.
- Harris, M., Raviv, A. *The theory of capital structure*. "Journal of Finance", vol. 46, 1991. 297-355 p. ISSN 1540-6261.
- Ignatczyk, W., Chromińska, M. *Statystyka: teoria i zastosowanie*. Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu, 1998. 165 p. ISBN 8372050333.
- Myers, S.C., Majluf, N. *Corporate Financing and Investment. When Firms Have Information that Investors Do Not Have*. "Journal of Financial Economics", vol. 13, 1984, 187-221 p. ISSN: 0304-405X.
- Norton, E. *Factors Affecting Capital Structure Decisions*. "Financial Review", vol. 26(3), 1991. 431-446 p. ISSN 1540-6288.
- Polska 2011 raport o stanie gospodarki*. Warszawa: Ministerstwo Gospodarki, Departament Analiz i Prognoz, 2011. 153-154 p. <http://www.mg.gov.pl/files/upload/8436/RoG2011.pdf>, accessed November 20, 2011. ISSN 1429-3005.
- Rajan, R.G., Zingales L. *What do we know about capital structure? Some evidence from international data*. "Journal of Finance", vol. 50, 1995. 1421-1460 p. ISSN 1540-6261.
- Rutkowski, A. *Zarządzanie finansami*. Warszawa: Polskie Wydawnictwo Ekonomiczne, 2000, 241-243 p. ISBN 832081278X.
- Shapiro, A.C. *Modern Corporate Finance*. New York: Mcmillan Publishing Company, 1990. 484 p. ISBN 0024095303.
- Skowroński, A. *Kształtowanie struktury kapitału jako przedmiot decyzji finansowych* [in:] scientific editor: Sobiech, J. *Kapitałowa strategia przedsiębiorstwa*. Poznań: Wydawnictwo Akademii Ekonomicznej w Poznaniu, 2002. 59-73 p. ISBN 8388760971.
- Szczepankowski, P.J. *Zarządzanie finansami przedsiębiorstwa*. Warszawa: Wydawnictwo Wyższej Szkoły Przedsiębiorczości i Zarządzania im. Leona Koźmińskiego, 2004. 92-95 p. ISBN 8389437171.
- Zygmunt, A., *Determinanty struktury kapitału przedsiębiorstw należących do branży przemysłu elektromaszynowego (w świetle badań empirycznych* [in:] Kopiński, A., *Finanse przedsiębiorstw*. Wrocław: Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu nr 98, 2010. 442-448 p. ISBN 978-83-7695-001-3.

14. Zygmunt, J. Polish companies financing in consideration of the pecking order theory [in:] scientific editor: Dutczak, M., The prospects of scientific and economic collaboration European Union and China in XXI century. Multi- aspect cooperation the European Union and China, Studia i Monografie. Z. 249, Opole: Oficyna Wydawnicza Politechniki Opolskiej, 2009. 147-152 p. ISBN 978-83-60691-64-9.

Primary Paper Section: A

Secondary Paper Section: AH