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THE BUILD-UP APPROACH. COULD IT BE AN ALTERNATIVE TO THE CAPM?

Abstract

Background: The paper contains the economic background for implementing the build-up approach as an alternative method to the Capital Assets Pricing Model (CAPM).
Research purpose: This study aims to consider company-specific risk premium that makes cost estimation unique, subjective, and different within the economic factors that may be considered and used for entity cost of equity estimation, valuation, or other economic metrics.
Methods: The author analyzes the most recent literature on companies' cost of equity and estimating specific risk premiums. Each component of the cost of capital in the build-up approach was analyzed and interpreted. The petroleum industry was analyzed between 2011 and 2021. The Mercer model for specific risk was used.
Conclusions: The build-up approach seems the best choice to calculate equity costs in a turbulent economic environment. However, due to its mathematical structure, it could be criticized for the huge subjectivity in the assessment risk premium rate. The key to using this method is to make it less subjective. This paper suggests an approach that minimizes the subjectivity in the build-up model. So far, there is no comprehensive analysis of the Polish market that has been prepared from the perspective of the petroleum industry's specific risk premium. This research creates possibilities for further comprehensive analysis related to models to calculate company risk premiums and the factors that affect them.

Keywords: discounted cash flows, CAPM, build-up approach, valuation, risk-free rate.

JEL classification: G12, G34, D24, D53, E43, E44

1. Introduction

The cost of capital is based on the rates of return expected by investors on various types of investments. Hence, the cost of equity is the rate of income required by shareholders. Unlike bond interest payments or preferred stock

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dividends, common stock dividends are not compulsory, and their value depends on the financial condition of the issuer. When allocating funds, investors have access to a wide range of investments. By accepting higher risk, they expect a higher income. The question is, how big a return above government bond yields will investors require to offset their equity market risk?

Build-up is an additive model in which the expected rate of return is estimated as the sum of the risk-free rate and the company-specific risk premium – CSRP.[1] Presenting the above concept in a mathematical formula, the build-up model takes the following form:[2]

$$E(R_{and}) = Rf + RP_m + RP_s + RP_{at} \quad (1)$$

where:

$E(R_{and})$ – expected/required rate of return by the market on the security *and*,
Rf – the risk-free rate of return,
RP_m – the general market risk premium,
RP_s – size premium,
RP_{at} – a risk premium "assigned" to a specific company or industry in which it operates.

This method of calculating a company-specific risk premium refers to finance behavior theory. All stakeholders of the entity determine their interest based on the rate of return to ensure that such an investment gives more utility than the substitute investment.

The main aim of the article is to present an alternative method to estimate equity costs, i.e., the build-up approach.

Following the literature review, the theoretical issues related to the build-up approach have been interpreted in light of contemporary economic processes and theoretical studies.

The study has been broken down into four sections:

- The first section concentrates on estimating risk-free rates and related implications.

[1] **E.W. Nath**, *Control Premiums and Minority Interest Discounts in Private Companies*, Business Valuation Review 1990/9 (2), pp. 39–47.

[2] **K. Byrka-Kita**, *Technika składania (build-up approach) jako alternatywna metoda szacowania kosztu kapitału*, Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania 2011/21, pp. 165–175.

- In the second section, there is a comprehensive analysis of the literature, which refers to company-specific risk premiums. Quantitive models are also presented.
- The goal of the next section is to describe the research design of the analysis. It presents the methodology used and the model to calculate equity costs based on the build-up approach.
- The last section contains the main finding, limitations, and suggestions for further research.

2. Estimating risk-free rates

The build-up model begins with the assumption that a risk-free asset and the expected return on that asset are known. In practice, financial instruments issued by a given country as treasury bonds, are often taken as risk-free. However, it does not define a risk-free rate.

The risk-free rate should reflect three elements:[3]

- The "rental" rate – the actual return on borrowing cash during the investment period.
- Inflation – the expected inflation rate over the investment period.
- Investment risk – the risk that the main market value of an investment will increase or decrease in the period up to maturity as a function of changes in the overall level of interest rates.

All three of these economic factors are built into the rate of return up to maturity. However, it is not possible to observe the market consensus as to what part of the yield for a given maturity is attributed to these factors. For an investment to be free in such a market environment, the actual return must be equal to the expected return.

In turn, the risk of reinvestment is related to the fact that we cannot predict what the interest rate on government instruments (let us assume bonds) will be after a certain time because the bond coupons will most likely be reinvested.

These considerations indicate that in economic practice, it is very difficult, if not impossible, to find a completely risk-free asset. A possible solution is to consider additional variables when estimating the risk-free rate:

[3] **R.J. Grabowski**, *Cost of Capital Estimation in the Current Distressed Environment*, The Journal of Applied Research in Accounting and Finance 2009/4 (1), pp. 31–40.

- The standard risk that accompanies financial instruments issued by each government, i.e., the risk that the lender assumes when the borrower is unable to repay the required debt obligation.
- The derivative to swap or offset for credit risk of a given country. Due to the international scope, the CDS (credit default swap) should be used.

3. Equity/company-specific risk premium

The next step when estimating the cost of capital using the build-up method is to determine the ERP (equity risk premium) and CSRP (company-specific risk premium). From a theoretical point of view, the equity risk premium is a function of the level of risk aversion manifested by investors compared to risk-free assets.[4] In practice, the most common measures of total market returns are based on broad stock indices such as the S&P 500 and the Dow Jones Industrial.[5]

The ERP level can be precisely defined mathematically:[6]

$$ERP_t(k) = E_t[R_{t+k}] + R^f_{t+k} \tag{2}$$

where:

R^f_{t+k} – the risk-free rate when investing from t into $t + k$ (which is risk-free).

The controversy over the risk premium is mainly due to the lack of agreement on quantifying investors' expectations of their risk aversion. The literature on the subject has the following approaches to estimating such a premium:[7]

- A model of the historical average of realized returns.
- A discounted dividend model (DDM).
- A cross-sectional regression model.
- A time series regression model.

In the historical average of realized returns model, historical rates of return from a given investment portfolio are used in relation to the risk-free rate applicable at a given moment – in this case CSRP is calculated as the surplus

[4] **A. Damodaran**, *The Dark Side of Valuation*, Prentice Hall, USA 2001, pp. 78–92.

[5] **P. Fernandez**, *Equity Risk Premium in 100 textbooks*, IESE Business School 2009, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=933070; accessed 2.04.2022.

[6] **F. Duarte**, **C. Rosa**, *The Equity Risk Premium: A Review of Models*, Federal Reserve Bank of New York Staff Reports 2015/21 (2), pp. 39–57.

[7] **T. Adrian**, **R.K. Crump**, **E. Moench**, *Pricing the Term Structure with Linear Regressions*, Federal Reserve Bank of New York Staff Reports 2013/110, pp. 110–138.

of the realized rate of return over the risk-free rate . Goyal and Welch point out that the main drawback is that it looks only backward and assumes that the future will behave like the past. An additional problem is the choice of the appropriate time horizon by calculating the historical values of a given variable.[8] In the model of discounted dividends for owners, it is assumed that the value of shares is determined by the size of cash flows generated for shareholders.[9] Therefore, today's share value is a function of the amount of cash flows that can be achieved in the future and an appropriate discount rate that expresses the risk of these flows and considers the time value of money. The DDM model looks to the future and is consistent with the theory of price arbitrage.[10] Cross-sectional regressions find ERP by answering the following question: What is the level of ERP that makes the expected returns from different stocks consistent with their exposure to a given stock index? The first step is to find the exposure of an asset to a stock index.[11]

Examples of variables that can be used in the model are inflation, unemployment, bond yields, and the ratio of the dividend payout ratio to the share price of a given stock index. Other factors that can be used are the risk factors proposed by Fama and French[12] or Carhart's[13] angular momentum.

Harvey, Liu, and Zhu cite as disadvantages the dependence of results on the portfolios used, the selection of state variables, and risk factors. They also add that the model is, in practice, difficult to implement compared to other ERP estimation options available in the literature.[14]

The time series regression model uses the relationship between economic variables and the rate of return of a stock index. The anticipated or expected component of excessive rates of return is estimated. Implementing the time series method is quite simple because it involves only ordinary regressions carried

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[8] **A. Goyal**, **I. Welch**, *A comprehensive look at the empirical performance of equity premium predictions*, Review of Financial Studies 2008/21 (4), pp. 1455–1508.

[9] **M.J. Gordon**, *The investment, financing, and valuation of the corporation*, Greenwood Press, Homewood 1962, pp. 122–156.

[10] **S. Singh**, **D. Jotwani**, *The Effect of Macroeconomic Variables on Stock Prices: A Conceptual Framework of the Arbitrage Pricing Theory*, GFJMR 2013/5, pp. 65–73.

[11] **J.Y. Campbell**, **S. Thompson**, *Predicting excess stock returns out of sample: Can anything beat the historical average?*, Review of Financial Studies 2008/21 (4), pp. 1509–1531.

[12] **E.F. Fama**, **K.R. French**, *The cross-section of expected stock returns*, Journal of Finance 1992/47 (2), pp. 427–465.

[13] **M.M. Carhart**, *On persistence in mutual fund performance*, Journal of Finance 1997/52 (1), pp. 57–82.

[14] **C.R. Harvey**, **Y. Liu**, **H. Zhu**, *...and the Cross-Section of Expected Returns*, The Review of Financial Studies 2014/29 (1), pp. 5–68.

out using the least squares method. The challenge, however, is to choose the variables of the equation. Goyal and Welch point out that including more than one predictor gives poor predictions, even though economic theory may suggest the role of multiple variables to be used simultaneously.[15]

There has been great interest in models aimed at *ex-ante* ERP analysis since the 1980s. In 1985, Mehra and Prescott published a paper in which they considered the problem of risk premium from the point of view of utility theory.[16] According to their research, the ERP based on an *ex-post* analysis is so high that it is not justified by any known economic theory. To take a closer look at their conclusions, a literature review was conducted on the definition of ERP and the related metrological controversies.

The most extensive research so far was presented by Fernandez based on 150 monographs and textbooks between 1979 and 2009.[17] The results show that the risk premium ranges from 3 to 10%. Such a range undoubtedly confuses both theoreticians, who deal with the theory of finance and accounting, as well as economic practitioners.

Gong and Zou[18] and Siegel[19] drew attention to the equity premium puzzle, which points to a significant difference between the average ERP estimated based on *ex-post* and *ex-ante* methods. Discrepancies in estimates should be mainly seen in the differences in the ERP definitions used. For example, in the *Stocks, Bonds, Bills, and Inflation Yearbook 2005: Classic Edition*, Ibbotson Associates estimated the market risk premium in the range of 4.9–8.5% compared to long-term bonds.[20] In the same year, a survey conducted on the CFO group in the United States indicated that the average risk premium is between 2.88% and 4.65%.[21]

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15 **A. Goyal**, **I. Welch**, *A comprehensive look*…, pp. 455–498.

16 **R. Mehra**, **E. Prescott**, *The Equity Premium: A Puzzle*, Journal of Monetary Economics 1985/15 (2), pp. 145–161.

17 **P. Fernandez**, *The equity risk premium in 150 textbooks*, Journal on New Finance 2009/1 (3), pp. 1–44.

18 **L. Gong**, **H. Zou**, *Direct preferences for wealth, the risk premium puzzle, growth, and policy effectiveness*, Journal of Economic Dynamics & Control 2002/26 (2), pp. 247–270.

19 **J. Siegel**, *Stocks for the Long Run. The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies*, McGraw-Hill Companies, Inc., New York 2002, p. 107.

20 **Ibbotson Associates**, *Stocks, Bonds, Bills, and Inflation Yearbook 2005: Classic Edition*, Ibbotson Associates, Chicago 2005.

21 **J.R. Graham**, **C.R. Harvey**, *The long-run equity risk premium*, Finance Research Letters 2005/2 (4), pp. 185–194.

Meanwhile, according to Dobija, the natural, sustainable, free market reveals a risk premium of 8%.[22]

The ERP estimated by Baker and Wurgler was 3%, with a standard deviation of 4.7%. It was based on five variables: closed-end fund discount, the number of shares traded on the NYSE, average rates of return on IPOs (initial public offerings) on the first day, the share of new issuances, and dividend premium.[23] Based on surveys in the USA in 2012, Graham and Harvey estimated ERP at 5.7%, with a standard deviation of 3.2%.[24]

Summing up the considerations on ERP, the development of one benchmark for this category would significantly help when estimating the cost of capital and, thus, also, valuing the company using the income method.

The third stage of estimating the cost of capital using the build-up method is an adjustment related to the company-specific risk premium. One element of the model is the size premium. Smaller companies are characterized by a higher level of risk; therefore, investors expect a higher rate of return, which has a direct impact on a higher cost of capital. The size premium is calculated as the difference in the arithmetic mean of the rates of return between large and small companies listed on the public market.[25] In the literature on the subject, we can also find numerous studies that criticize the inclusion of size bonuses. This criticism was initiated by Daniel et al. in response to the multivariate model proposed by Fama and French. It considered the effect of enterprise size as an additional factor for the valuation of assets.[26]

In the literature, there are many criticisms of the size premium; however, none of the empirical studies carried out over the last three decades have classified this premium as a statistical error, so it should be considered one of the stages of estimating the cost of capital.

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[22] **M. Dobija**, *Dowód istnienia i liczbowa ocena premii za ryzyko*. *Artykuł dyskusyjny*, Zeszyty Teoretyczne Rachunkowości 2005/30 (86), pp. 33–41.

[23] **M. Baker**, **J. Wurgler**, *Investor sentiment in the stock market*, The Journal of Economic Perspectives 2007/21 (2), pp. 129–151.

[24] **J. Graham**, **C. Harvey**, *The Equity Risk Premium in 2012*, Unpublished paper 2012, Duke University.

[25] **K. Byrka-Kita**, *Uwzględnienie ryzyka specyficznego w procesie szacowania kosztu kapitału*, Zeszyty Naukowe Uniwersytetu Szczecińskiego, Finanse, Rynki Finansowe, Ubezpieczenia 2011/37, pp. 555–574.

[26] **K. Daniel et al.**, *Measuring Mutual Fund Performance with Characteristic-Based Benchmarks*, The Journal of Finance 1997/52 (3), pp. 1035–1058.

The final step is to estimate the risk-specific premium:[27]

- the industry in which the company operates,
- financial risk,
- the degree of diversification of activities,
- other operational characteristics (e.g., management board competencies, staff qualifications, trade unions activity).

In research on the nature of risk, Reilly defined specific risk as a series of operational activities related to the business activities of a given entity. These specific activities can be calculated by comparing the relevant financial and non-financial measures (identifying internal and external benchmarks) with their counterparts in twin entities (twin in terms of the type of business and financial results).[28]

Thus, the company-specific risk premium consists of the following:

a) Total risk – the risk specific to a particular security.
b) The volatility of rates of return caused by non-market factors (the special risk premium, by which the discount rate is increased to estimate the cost of equity).

As early as the mid-1990s, Falkenstein found that mutual funds have a significant preference towards stocks with high visibility and low transactions cost, and are averse to stocks with low idiosyncratic volatility.[29] In the literature on the subject, there are other examples of investors who mainly focus on investing in well-known companies, which leads to a lack of portfolio diversification.[30] Detailed observations of this aspect of the capital market led to the creation of models aimed at deepening the assessment of specific risks. Shepeleva noted that the differences in the risk assessment for different financial markets concern the industry in which the entities operate, their capitalization, total assets, number of employees, and revenues.[31] Meanwhile, Butler and Pinkerton proposed a model for estimating the specific risk premium without "detecting" the specific risk to which the company is exposed.

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[27] **J.R. Hitchner**, *Financial Valuation: Applications and Models*, John Wiley & Sons, USA 2003, p. 45.

[28] **R. Reilly**, *Business Appraiser Considerations to Measure the Company-Specific Risk Premium*, Business Appraisal Practice 2007, pp. 1–16.

[29] **E.G. Falkenstein**, *Preferences for Stock Characteristics as Revealed by Mutual Fund Portfolio Holdings*, Journal of Finance 1996/51, pp. 111–136.

[30] **G. Huberman**, *Familiarity Breeds Investment*, Review of Financial Studies 2001/14 (3), pp. 659–680.

[31] **A. Shepeleva**, *Evaluation of a company specific risk premium on emerging markets: A new approach*, Journal of Finance and Credit 2015/26 (698), pp. 41–54.

Capital markets cannot fully assess specific types of risk. Therefore, a beneficial solution to this problem may be the use of the total beta indicator.[32] Okulov[33] proposed a method for calculating specific risks according to the theory of financial investments. When potential investors determine their interest in investing in a stock, they should be confident that the return on such investment will be of higher utility than the alternative investment.[34] Several studies on the factors that influence a company's risk premia focus mainly on three groups of factors: industry, macroeconomic, and internal.[35]

4. Empirical research

The oil industry was chosen to apply the build-up model to estimate the cost of equity. Using the CAPM model for a company within this industry is questionable for at least two reasons:

a) Theoretical doubts underly the model, which in principle can be applied to all branches of the economy. The model is based on the neoclassical theory of equilibrium. It explains the formation of prices on the capital market considering idealized assumptions: an effective capital market, homogeneous expectations, and considerations in one period.
b) The international nature of these companies – companies from this industry are particularly exposed to many external risk factors.

Nevertheless, knowledge of the environment in which entities operate makes it possible to apply a build-up approach.

Oil extraction is one of the dominant energy markets in the world. The largest company in Poland that can be classified as a European "medium player"

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[32] **P. Butler**, **K. Pinkerton**, *Company-Specific Risk – A Different Paradigm: A New Benchmark*, Business Valuation Review 2006/25, pp. 22–28.

[33] **V.L. Okulov**, *Investment Decisions under Uncertainty: Risk Management Approach*, Vestnik SPbGU. Management 2017/16 (2), pp. 191–214.

[34] When the analyst or potential investor uses the total beta value, it should be borne in mind that the impact of this measure on the estimation of premiums/discounts. Total beta reflects the investor's exposure to the company if the investor does not have a diversified portfolio. It therefore considers systematic risk as well as any other risk premiums/discounts identified by the market, including the volume premium.

[35] E.g., Trugman (2002), Porter (2008), Kroll (2011), Morningstar (2013), Pratt, Shannon, Grabowski (2008), Deloitte & Touche LLP (2012), Pollard, Sherwooda, Klobusb (2018), Damodaran (2019), Sivitska, Makhmudov (2020), National Association of Certified Valuators and Analysts – valuation standards.

is PKN Orlen S.A. The cost of equity for the PKN Orlen S.A. was estimated using factors proposed by Mercer, which have been presented in Table 1.[36]

The principles of the study are as follows:

a) The analysis included companies from the oil extraction industry that were characterized by the highest average operating results in the ten years between 1 January 2011 and 31 December 2021. The data were taken from the EMIS database based on the International Standard Classification of All Economic Activities (ISIC). A limitation was the availability of financial data in all the years covered by the analysis. The study sample ultimately included 50 companies listed on public markets based in Latin America, Asia, the United States of America, Europe, and Africa.
b) Based on the daily share prices, the rates of return were calculated and logarithmized.[37] The daily rates were calculated according to the closing price of the trading session on a given day. In total, the collected database has 113,487 daily observations. The logarithmic rate of return of shares does not consider the dividend paid.
c) The beta parameter was calculated based on Sharpe's single-indicator model.
d) The primary explanatory variable in the estimated Sharpe model is the rate of return on the relevant stock index. Due to the global nature of the research sample, the S&P 500 index was used.[38]

TABLE 1: *Mercer's approach to CSRP (%)*

Specyfic risk	Min	Max
1	2	3
Key figures and company management	0	5
Company size	0	5
Financial structure	0	5

[36] **Z.C. Mercer**, *The Adjusted Capital Asset Pricing Model for Developing Capitalization Rates: An Extension of Previous "Build-Up" Methodologies Based Upon the Capital Asset Pricing Model*, Business Valuation Review 1989/4, pp. 147–156.

[37] The logarithmized rate of return should be understood as a rate in the range $-\infty; +\infty$. The rate of return was calculated for two adjacent moments and, from the point of view of financial mathematics, it includes a continuous capitalization process. The probability distribution is a transformation of the exchange rate distribution and has a different form than its price distribution.

[38] According to the author, the theory of the financial market has not yet developed a uniform position on this issue. In general, it can be said that the choice of the index depends to a large extent on the purpose of the study.

1	2	3
Product/geographical diversification	0	5
Customer diversification	0	5
Earnings: margins and historical predictability	0	5
Other specific factors	0	5

S o u r c e: **Z.C. Mercer**, *The Adjusted Capital Asset Pricing Model for Developing Capitalization Rates: An Extension of Previous "Build-Up" Methodologies Based Upon the Capital Asset Pricing Model*, Business Valuation Review 1989/4, pp. 147–156.

According to the structure of the build-up model, the risk-free rate was defined and estimated in the first step. It was estimated based on the level of profitability up to the maturity of the Polish Treasury bonds, with a maturity of at least ten years from the date of estimate. The level of yields on bonds was adjusted by the yield on CDS – credit default swap. At the time of the research, the yield on selected securities was 7.18% for treasury bonds and 2.52% for CDS instruments.

The next stage of the research process analyzed the beta coefficient. For PKN Orlen S.A., it was 1.09. The beta test statistics for the surveyed entities between 1 January 2011 and 31 December 2021 were as follows: median 0.41, weighted average 0.32, minimum value –1.33, maximum value 2.4. The test statistics for individual countries were very diverse, as presented below in Table 2.

TABLE 2: *Beta statistics in selected countries*

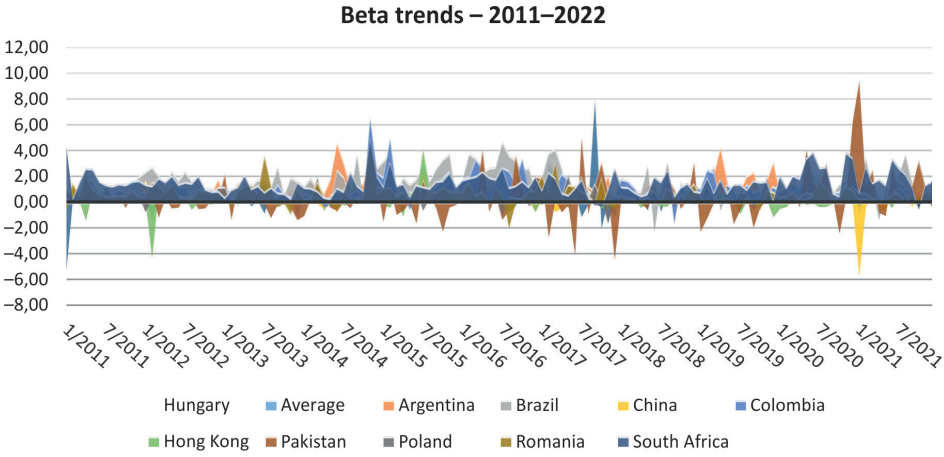
Statistics	Market average	Argentina	Brazil	China	Colombia	Hong Kong	Hungary	Pakistan	Poland	Romania	South Africa
Standard deviation		0.74	1.08	0.60	0.84	0.60	0.80	1.27	0.48	0.62	0.88
Median	0.41	0.93	1.46	0.37	0.96	0.12	0.41	0.17	0.48	0.56	1.38
Mean	0.32	1.76	2.04	1.45	0.57	–5.36	1.49	0.73	–0.30	5.05	1.51
Min	–1.33	–0.56	–2.34	–5.78	–1.64	–4.34	–5.45	–4.47	–1.68	–2.00	–0.58
Max	2.40	4.58	6.01	2.58	6.53	4.16	7.92	9.42	2.15	3.88	5.05

S o u r c e: own study.

The market risk premium was determined as the difference between the risk-free rate and the market rate of return. The average capital risk premium for Poland over the analyzed period was 5.08%.

A key step in estimating the cost of equity using the build-up model is determining the specific bonus associated with the analyzed entities. Using Mercer's model, individual risk areas are presented in Table 1. When assessing the risk in individual areas, the beta test statistics for the entire research sample were used and compared with the value of PKN Orlen's beta coefficient. Since the value of the coefficient for PKN Orlen is higher than one, it means that the industry is characterized by a higher level of risk, which is why a risk premium specific to that company should be applied at a level higher than zero. According to the adopted model, a risk of 5% corresponds to the maximum value of the beta coefficient for the analyzed industry (the maximum value of the beta coefficient is 2.42). This premium has been proportionally reduced for all risk areas to 2.26%.[39]

FIGURE 1: *Beta statistics in selected countries*



S o u r c e: own study.

[39] Depending on the purpose of the valuation in the context of the adopted model, the only area of specific risk whose value could be significantly reduced is the premium for the size of the enterprise (e.g., valuation for internal purposes – PLK Orlen is the largest enterprise in the industry in Poland). The remaining factors are macroeconomic, so their potential adjustment beyond robust market data could be easily undermined.

Therefore, the cost of equity for PKN Orlen using the build-up method was 31.08%, while for CAPM model, it was 20.25%.[40] Choosing the right method for estimating the cost of equity is, of course, characterized by a high degree of subjectivity. An investor should decide what level of return they demand in the context of the current economic situation, macroeconomic forecasts, and retrospective values of the rate of return on shares at PKN Orlen. Post-pandemic life, the war in Ukraine, the global economic slowdown, and the potential capital gain on the sale of PKN Orlen shares (the maximum rate of return in the period 1 January 2011 – 31 December 2021 was about 13%), undoubtedly indicates that there are more specific factors that affect the cost of equity that the CAPM model is not able to capture. Thus, the build-up method can be used as an alternative.

5. Conclusion

The study proposed a method for estimating the size of a company's specific risk premium based on Mercer's existing model which operates in the oil extraction industry, which is one of the key energy sector in Poland. The literature review revealed several studies on estimating premiums based on financial indicators. While some researchers have paid attention to factors related to the economic environment of the enterprise, others generally make different assumptions, testing new methods that can be used effectively in economic practice.

The limitations that prompt the author to undertake further in-depth research on the issue are related to the concretization of specific risk factors. The first limitation is that only one industry in a specific time horizon was analyzed. Therefore, it may be useful to identify other factors that affect the amount of risk in the analyzed industry. Thus, further research in this area can be devoted to analyzing financial factors, e.g., profitability or debt level, which show a correlation with each other. Further research will focus on identifying these factors.

[40] With the CAPM model, there is a general opinion that investors are risk averse and, therefore, the market risk premium cannot be negative. Since the rate of return on the capital market is lower than the risk-free rate, the investor should ask himself "Is the asset worth investing?" In the analyzed case, the level for market risk was adopted as the value of the guaranteed risk-free rate. An alternative solution could be to base the calculation on a long position in risk-free assets and possibly a short position in risky assets.

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Michał GNAP

MODEL BUILD-UP. CZY MOŻE BYĆ ALTERNATYWĄ DLA MODELU CAPM?

Abstrakt

Przedmiot badań: Przedmiotem badania jest analiza założeń ekonomicznych leżących u podstawy modelu build-up jako metody alternatywnej możliwej do zastosowania w praktyce gospodarczej do modelu wyceny aktywów kapitałowych (CAPM – *capital assets pricing model*).
Cel badawczy: Celem badania jest analiza premii za ryzyko specyficzne firmy, które sprawia, że estymacja kosztu kapitału jest wyjątkowa, subiektywna i różnorodna w zależności od otoczenia gospodarczego firmy.
Metoda badawcza: Autor pracy dokonał przeglądu najnowszej literatury, dotyczącej kosztu kapitału własnego przedsiębiorstw oraz szacowania premii za ryzyko specyficzne. Każdy składnik kosztu kapitału w podejściu build-up został przeanalizowany i poddany interpretacji. Badania zostały przeprowadzone w oparciu o próbę przedsiębiorstw z branży przemysłu naftowego w horyzoncie czasowym 2011–2021. Ponadto wykorzystano model Mercera do oszacowania kosztu kapitału wynikającego z ryzyka specyficznego firmy.
Wyniki: Podejście build-up wydaje się być najlepszym wyborem do kalkulacji kosztów kapitału własnego w turbulentnym otoczeniu gospodarczym. Ze względu na swoją matematyczną strukturę można ją krytykować za duży zakres subiektywności w ocenie stawki premii za ryzyko specyficzne. Kluczowym aspektem stosowania takiej metody jest uczynienie jej mniej subiektywną. W artykule zaproponowano podejście minimalizujące skalę subiektywności w modelu build-up. Jak dotąd brak jest kompleksowej analizy polskiego rynku, która zostałaby przygotowana z perspektywy specyficznej premii za ryzyko przemysłu naftowego. Badania te stwarzają możliwości dalszej kompleksowej analizy, związanej z modelami obliczania premii za ryzyko przedsiębiorstwa oraz czynnikami, które na nie wpływają.

Słowa kluczowe: zdyskontowane przepływy pieniężne, CAPM, metoda build-up, wycena, stopa wolna od ryzyka.