
Investment Appraisal Practice in the Biggest Companies in Poland*

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Marcin Pawlak¹, Anna Rapacewicz², Dariusz Zarzecki³

Abstract:

Purpose: The preliminary research carried out in 2020 in the group of the largest public companies in Poland was to check whether these companies use the NPV method and whether the method of assessing investment proposals is consistent with the indications of the theory.

Design/Methodology/Approach: An empirical research was conducted in Poland in 2020 by interviews with management board members responsible for investment decisions, representing the largest public companies in Poland, information was obtained about the organization of the process of evaluating investment proposals.

Findings: The survey confirmed the popularity of NPV application in the largest public companies in Poland, as all surveyed entities use this method. It is also no surprise that as many as 93.3% of the surveyed companies use IRR. What is surprising, however, is the frequency of using the payback period commonly criticized in the theory as a project evaluation criterion. This method is used by 80.0% of the largest public companies.

Originality/value: This survey is one of the few studies on investment appraisal procedures in the largest Polish public companies.

Keywords: Investment valuation methods, capital budgeting, investment appraisal.

JEL classification: D25, G31, O16.

Paper Type: Research study.

¹Faculty of Economics, Finance and Management, University of Szczecin., e-mail: marcin.pawlak@usz.edu.pl;

²Faculty of Economics, Finance and Management,, University of Szczecin., e-mail: anna.rapacewicz@usz.edu.pl;

³Faculty of Economics, Finance and Management, University of Szczecin., e-mail: dariusz.zarzecki@usz.edu.pl;

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1. Introduction

The functioning of enterprises in the conditions of global competition and rapidly changing business environment implies the necessity to implement strategic investment projects. These projects, in addition to assessing the possibility of achieving assumed goals, must include an investment appraisal. From the theoretical point of view, it is not difficult to assess the economic effectiveness. In practice, the complexity of decision-making situations is an issue that requires solving many different types of problems starting with assessment method selection and ending with risk and cost of capital assessment. The term “investment” used for the purpose of this study refers to long-term strategic investments.

A systematic approach to the investment decision-making process requires an organizational structure which facilitates the gathering and transferring of information on potential projects. This should be manifested in the functioning of uniform procedures ensuring reliable analysis and appraisal of investment proposals, both in terms of the accuracy and correctness of calculations, as well as budget priorities and constraints in the company.

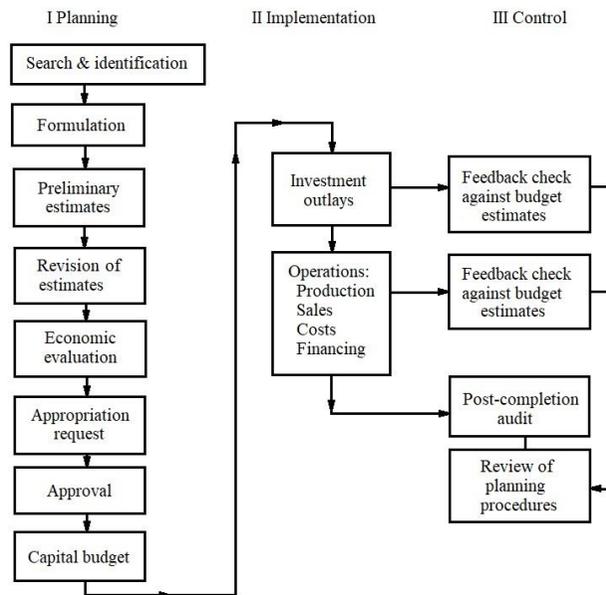
The objective of the study was to identify current investment appraisal practice in the biggest Polish enterprises. The research was based on a survey conducted among the biggest firms listed on the Warsaw Stock Exchange. This survey is one of the few studies on investment appraisal procedures in the largest Polish public companies.

2. Literature Review

Issues related to capital budgeting and investments are the subject of many studies, primarily in the field of finance, accounting, economics and management.¹ There is no doubt that the most important part of capital budgeting is the analysis and evaluation of investment proposals and deciding which projects will undertake.

Figure 1 sets out a simplified flow chart for a typical investment proposal. The flow chart assumes that the firm employs a formal capital budget based on intensive financial planning. Practice, however, is far from uniform even among medium-sized and large firms which typically budget their capital expenditures. Length of budget period, definition of projects, evaluation techniques and administrative procedures vary greatly from firm to firm.² Graham and Harvey found that large firms use NPV more often than small ones.³ Traditional methods such as the Payback and the Accounting Rate of Return has nearly disappeared as the primary method of analysis for large companies.⁴ There are many studies on the practice of investment project evaluation in the literature. Most of them concern developed countries. There are also international comparisons and sector studies. Much less research relates to less developed countries.

Figure 1. Project planning



Source: Levy, H., Snart, M. 1990. *Capital Investment & Financial Decisions*. 4th Edition. Cambridge: Prentice Hall.

The economic and social development of European countries, including Poland, in the second decade of the 21st century takes place in unstable and unpredictable conditions. Rapid changes in the global economy are accompanied by economic, political, and social turbulences. Poland is the largest economy of former Eastern Bloc. In the 1990s, it underwent a transformation from a socialist to a market economy. Since the political and economic breakthrough in the 1990s occurred investment activity in Poland exploded. Despite this, the literature contains only a few studies related to investment appraisal practice in the target country.

Table 1. The review of studies in the field of investment appraisal practice in Poland

No.	Author	Research focus	Conclusions
1.	Wisniewski and Zarzecki (1995)	Investment appraisal practice in Szczecin Voivodship firms	Investment practice in Polish companies differs from that in countries having stable market economy, techniques based on discounted cash flow are nearly unknown, investment decisions are based in most on qualitative techniques.
2.	Andor, Mohanty and Toth (2011)	Companies' capital budgeting practices in Central and Eastern European countries	Polish companies employ appraisal methods as follows: PP (100%), AB (86%), NPV (76%), IRR (76%).
3.	Rogowski (2013)	Investment practice in Polish companies	Polish companies employ discounted methods (32%) or discounted and simple appraisal methods (39%).
4.	Wnuk-Pel	Capital budgeting	Polish companies employ the same methods of

	(2014)	methods in Polish companies	capital budgeting as in more developed countries, most of the companies use NPV, sensitivity analysis, scenario analysis and formalisation of investment appraisal, the use of capital budgeting methods differ from other countries.
5.	Wnuk-Pel (2015)	Capital budgeting methods and factors determining their selection in companies operating in Poland	Polish companies employ the same methods of capital budgeting as companies in more developed countries; IRR and NPV are used more extensively by companies with foreign capital, large companies and companies with large capital expenditure budgets.

Source: Authors' research.

3. Methodology

An empirical research was conducted in Poland in 2020. Through interviews with management board members responsible for investment decisions, representing the largest public companies in Poland, information was obtained about the organization of the process of evaluating investment proposals. Other issues raised during interviews were frequency of the use of investment appraisal techniques, methods of estimating the cost of equity, approaches to a residual value determination, dominant source of financing investments, and challenges of investment projects appraisal.

The research was focused on the largest 50 companies listed on the Warsaw Stock Exchange. First, companies from WIG30 index were chosen. Then, the rest was selected on the basis of market capitalization. Companies representing financial sector were excluded from the research. Ultimately, 15 management board members were interviewed.

Table 2. *Surveyed companies and their financial characteristics*

No.	Company	Revenue	Gross profit	Total assets	Book Value	Market Value	P/E	P/BV
		2019			as of 18 September 2020			
		mln PLN						
1.	AMREST	8 350.2	301.1	10 957.5	1 830.0	4 317.0	53.6	2.4
2.	ATAL	711.4	135.8	2 385.6	811.2	1 296.9	14.3	1.6
3.	COMARCH	951.7	67.4	1 395.0	982.3	1 740.5	15.5	1.8
4.	CYFROWY POLSAT	951.7	701.5	14 941.3	14 291.0	17 011.9	16.7	1.2
5.	ENEA	5 100.2	287.3	24 696.6	14 820.5	2 445.6	3.9	0.2
6.	ENERGA	86.0	-413.0	13 573.0	8 442.0	3 151.1	-	0.4
7.	GPW	183.6	126.8	792.8	845.0	1 783.8	14.3	2.1
8.	GRUPA AZOTY	1 987.0	105.6	9 240.4	7 219.5	2 390.6	9.2	0.3
9.	KGHM	17 683.0	1 927.0	35 989.0	20 315.0	26 400.0	22.9	1.3

10.	LOTOS	26 313.0	955.2	16 475.6	11 140.0	7199.0	-	0.7
11.	PGE	15 146.0	-1 190.0	50 438.0	42 842.0	10 463.2	-	0.2
12.	PKP CARGO	3 572.0	19.2	7 020.3	3 158.0	519.5	-	0.2
13.	PLAY	15 146.0	-1 190.0	50 438.0	354.0	6 650.5	7.9	18.8
14.	TAURON PE	10 680.6	-346.2	30 485.1	17 684.7	3 392.9	-	0.2
15.	ZCH POLICE GA	2 419.1	66.7	2 487.7	1 643.4	1 502.5	111.0	0.9
Total		109 281.5	1 554.3	271 315.9	146 378.6	90 265.0	-	0.6
Average		7 285.4	103.6	18 087.7	9 758.6	6 017.7	-	2.1

Source: Companies' financial statements and Warsaw Stock Exchange data.

4. Research Results and Discussion

The widespread use of NPV and IRR in the largest public companies is fully in line with expectations. In practice, it is sufficient to use one of these measures, because in the case of typical investment projects, both lead to the same recommendations. Company analysts and external financial analysts, however, usually calculate both measures, which is to facilitate a better and more illustrative assessment of the project under consideration. It is worth noting that while NPV is a measure that allows direct determination of whether a project is profitable (NPV greater than zero) and ranking individual projects according to their attractiveness in terms of added value for the company (from the highest to the lowest NPV), the use of IRR requires to compare it with the cost of capital. Only those projects for which $IRR > 0$ are attractive. The research shows that the largest public companies in Poland use both methods simultaneously. They are closely related to each other and generally lead to identical recommendations. However, it is somewhat surprising that the third method of project evaluation belonging to the group of discount methods, namely the Profitability Index (PI), is not used in practice. Its use was indicated by only one of the surveyed companies. This can be explained by the much lower knowledge of this method among managers and analysts, as well as the fact that its use leads to obtaining recommendations identical to NPV and IRR.

Table 3. Investment procedures in the biggest Polish companies

Question	No of firms	%
Capital budget prepared for longer than two years	15	100.0%
Detailed instruction for capital budgeting	15	100.0%
Formal body responsible for preparation of investment proposals	13	86.7%
Formal body responsible for assessment of investment proposals	15	100.0%
Full time employed person dealing with investment appraisal	15	100.0%
Established minimal expected rate of return for projects	15	100.0%
Procedure of regular update of expected rate of return	15	100.0%

Source: Authors' research.

Table 4. Application of investment appraisal methods

Method	No of firms	%
Net Present Value	15	100.0%
Internal Rate of Return	14	93.3%
Accounting Rate of Return	0	0.0%
Payback Period	12	80.0%
Profitability Index	1	6.7%
Others	3	20.0%

Source: Authors' research.

Table 5. Cost of capital estimation methods

Method	No of firms	%
Determined by management board	6	40.0%
CAPM	9	60.0%
Others	0	0.0%

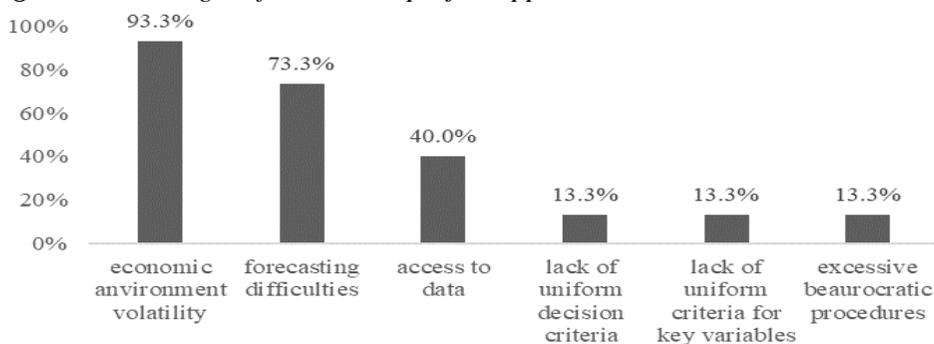
Source: Authors' research.

Table 6. Residual value estimation methods

Method	No of firms	%
Assumed to be zero	2	13.3%
Individual for each project	11	73.3%
“Rule of thumb”	0	0.0%
Others	2	13.3%

Source: Authors' research.

Figure 2. Challenges of investment project appraisal



Source: Authors' research.

Table 7. Sources of funding investment projects

Source	No of firms	%
Retained earnings	12	80.00%
New issue of shares	1	6.67%
Borrowed capital	7	46.67%
Others	1	6.67%

Source: Authors' research.

Returning to the surprisingly high popularity of the payback, it would be worthwhile to deepen the research in this area by asking respondents about the motives and justification for using this method. The classic payback does not consider the time value of money, and thus also the risk of projects. This measure also does not consider the cash flows occurring after the period in which the cash flows in the project have equalled capital expenditure. In addition, the use of this measure requires the definition of the so-called cut off payback period against which the calculation result is compared. The cut-off point is set arbitrarily by companies and it is difficult to find a convincing justification for a specific number.

Therefore, it is a very imperfect measure and completely inconsistent with the postulates of the theory of corporate finance. The question about the motives and justification for its use is therefore completely natural and obvious. At this point, a hypothesis can be put forward based on the agency theory that managers, striving to achieve and demonstrate their management successes, will be willing to undertake projects with a shorter payback in order to obtain appropriate remuneration, promotion or other more ambitious and professionally attractive tasks. A factor that strengthens the use of the payback period may be a remuneration system that motivates the achievement of short-term goals, thus favouring the undertaking of projects with a short payback. Another factor contributing to the frequent use of the payback is probably the term of office of management boards, which may be particularly noticeable in the case of companies with a dominant share of the State Treasury.

Most of the surveyed companies (60.0%) estimate the cost of equity using the CAPM, while in the remaining companies it is determined by the management board or the unit responsible for it. Today, the use of the CAPM is considered a standard, so it can be assumed that most of the largest public companies in Poland behave like their counterparts in the most economically developed countries. A separate issue is the method of estimating the parameters of this model, i.e. the risk-free rate of return, market risk premium and the risk index (Beta).

Relatively least controversial is the determination of the risk-free rate of return and the market risk premium. However, determining the risk index (Beta) is problematic.⁵ This was confirmed by the 2014 review of 24 valuations of the largest companies listed in Warsaw (excluding companies from the financial sector) carried out in the period April 2013-August 2014 by leading Polish brokerage houses.⁶ The aim was to analyse techniques of estimating the cost of equity capital, cost of debt, WACC. The estimation of the Beta was also assessed as a measure of total risk, and then the correlation with the basic financial ratios was examined. In no case did the valuations prepared by brokerage houses provide for the determination of the Beta risk index - the key variable in estimating the cost of equity capital using the CAPM. It is not known on what basis the level of this ratio was determined for individual companies. Therefore, we do not know to what extent the adopted Beta results from the level of operational risk (Unlevered Beta), and to what extent it is determined by

the level of financial risk. It was surprising that the Beta index was slightly differentiated in the group of surveyed companies, with 2/3 of them having an index equal to 1. This means that - on average - the volatility of rates of return in these companies is assumed to be identical to the market index volatility. None of the analyzed companies had the Beta lower than 1, which may be surprising, because the largest companies are characterized by, on average, taking less risk than medium-sized, and especially small companies in terms of market capitalization. Therefore, it could be expected that at least some of the analysed companies will have the Beta index lower than 1.

We do not know how the cost of equity is established in those companies where it is determined by the management board or the appropriate organizational unit. It can be presumed that at least some of the companies apply some analytical method of estimating the cost of equity. This may be a simplified CAPM variant or the company's rule of thumb. In addition to classic methods of estimating the cost of equity capital, such as the Build-up Method or CAPM, interesting methods of estimating the cost of equity capital are the Butler-Pinkerton Model (BPM) and the Arbitrage Pricing Model (APM). However, these methods are not widely known to Polish analysts and managers. The BPM method is primarily dedicated to estimating the cost of equity of non-public companies, most of which are small and medium-sized firms. Detailed techniques for estimating the total Beta are issues to be resolved. The BPM model, like the others mentioned earlier, raises numerous controversies, which are reflected in scientific publications and polemics.⁷

It is worth recalling here the discussion on the validity of the CAPM, which has been used for many years for estimating the cost of equity. In the opinion of many authors, this model does not capture the actual regularities existing on the capital market and therefore - according to critics - it should not be used in practice. One of the leading critics of the CAPM is Pablo Fernandez, who published an article questioning the validity and usefulness of this model.⁸ When asked about the dominant source of investment financing in the last two years, as many as 12 respondents (80%) indicated retained earnings, i.e. internal equity. The new issue (i.e. external equity) was indicated only in one case (a large investment in the chemical sector). Debt (loans and corporate bonds) was only a supplement to financing from own resources and was the dominant source of financing only in a few companies.

The small role of debt in financing investments in the largest public companies in Poland is surprising and puzzling. Financing new investments mainly from retained earnings proves the low intensity of investment processes. In these uncertain times, companies are holding back decisions on new investments. On the other hand, banks are cautious and reluctant to enter innovative large projects, preferring investments with a simple and repeatable model (e.g. developers, shopping malls). Currently, the scale of commercial investments in Poland is small compared to 1990-2010. Among

large investments, infrastructural ones dominate, financed mainly from national public funds or the European Union.

This is also confirmed by data from commercial banks. Long-term investment loans for large companies account for only about 5% of the entire loan portfolio of Polish banks. It is even more surprising as interest rates are currently extremely low, which should encourage companies to borrow money. The problem of low involvement of banks in financing corporate investments in Poland should be a concern of both the Polish government and the central bank (Narodowy Bank Polski). Continued low funding by banks may reduce the GDP growth rate in Poland in the coming years - especially in the situation of the crisis caused by the COVID-19 pandemic. On the other hand, the Polish corporate bond market is very shallow, and potential investors are scared and discouraged by its poor reputation after large and spectacular financial scandals⁹.

The cost of equity in the surveyed companies ranges from 6.15% to 14.0% (it means a range of 7.85%), the average value is 9.64% and the standard deviation is 2.21%. The WACC ranges from 5.30% to 10.70% (5.40% range), the mean value is 7.38%, and the standard deviation 1.91%. These figures are not surprising, although in an environment of low interest rates and regarding the largest companies, slightly lower discount rates could be expected. WACC is lower than the cost of equity by 23.4%, which means a relatively small degree of financial leverage used by the companies. These results are consistent with the relatively low importance of debt in financing investments, as shown in this study.

5. Conclusions

The main goal of this paper was to check whether the largest public companies in Poland use the NPV method and whether the method of assessing investment proposal is consistent with the indications of the theory. It can be concluded that there is currently no difference between the practice of investment appraisal in the largest Polish public companies and their counterparts in the most developed countries of the world. The study showed that all of the surveyed companies: 1) develop an investment expenditure plan for more than two years, 2) have detailed procedures for investment expenditure, 3) employ at least one full-time person dealing with the evaluation of investment projects, 4) have a unit responsible for evaluation of the investment projects, 5) have a specific minimum expected rate of return on projects (WACC), 6) have a procedure for updating the minimum expected rate of return on projects.

According to the study the most popular investment appraisal method is NPV (100%), followed by IRR (93.3%). Most surprising is the frequency of using the criticized payback period (80.0%). However, it seems to be only a supplement to NPV and IRR. On the other hand, a positive information is the complete abandonment of using the multi-flawed average accounting rate of return. None of

the largest companies listed on the Warsaw Stock Exchange indicated this measure as a decision-making criterion in project evaluation.

More than a half of the surveyed companies estimate the cost of equity using the CAPM, while in the remaining companies it is determined by the management board. The residual value in most companies (73.3%) is determined individually for each project, and only in a few cases (13.3% of the surveyed companies) it is assumed to be zero. The respondents considered the greatest challenges related to the appraisal of investment projects as follows: high variability of the environment (93.3% of responses), difficulty in forecasting (73.3%) and access to data (35.7%).

The key findings of this survey are consistent to the proposition that the theory-practice gap has narrowed in recent years. Poland with its open economy, the EU membership, technological advancement, and progress in financial education, has shorten the distance from the leading countries as far as the application of modern investment appraisal methods is concerned. Issues for further research include the amazing popularity of the payback period and the low level of debt utilization.

Further research in this field in Poland is advocated as it can contribute to better recognition of deviations from generally accepted standards in the field of investment practice and, consequently, greatly improve the decision making process and render possible increase of effectiveness of investments.

References:

- Abdullah, N.H., Nordin, S. 2008. The Theory-Practice Gap of Project Appraisals. *Jurnal Pengurusan*, 27, 85-104.
- Al Rahahleh, N.M., Mukherjee, T.K. 2013. Capital Budgeting Techniques in Practice: U.S. Survey Evidence, in: *Capital Budgeting Valuation: Financial Analysis for Today's Investment Projects*, 151-171.
- Andor, G., Mohanty, S., Toth, T. 2011. *Capital Budgeting Practices: A Survey of CEEan Firms*. Word Bank, 1, 1-45.
- Block, S. 1997. Capital budgeting techniques used by small business firms in the 1990s. *Engineering Economist*, 42, 289-302.
- Brealey, R.A., Myers S.C., Marcus A. 2017. *Fundamentals of Corporate Finance 9th Edition*. New York, McGraw-Hill Education.
- Fernandez, P. 2017. Is it Ethical to Teach that Beta and CAPM Explain Something? https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2980847.
- Graham, J.R., Harvey, C.R. 2002. How do CFOs make capital budgeting and capital structure decisions? *Journal of Applied Corporate Finance*, 15(1), 8-23.
- Kasper, L. 2008. The Butler Pinkerton Model for Company-Specific Risk – A Critique. *Business Valuation Review*, 27, 233-243.
- Levy, H., Snart, M. 1990. *Capital Investment & Financial Decisions 4th Edition*. Cambridge, Prentice Hall.
- Lumby, S. 1991. *Investment Appraisal and Financing Decisions Fourth Edition*. London, Chapman & Hall.

- Markovics, K.S. 2016. Capital budgeting methods used in some European countries and in the United States. *Universal Journal of Management*, 4(6), 348-360.
- Pike, R.H., Neale, B. 1993. *Corporate Finance and Investment. Decisions and Strategies*. Hemel Hempstead, Prentice Hall.
- Rogowski, W. 2013. *Rachunek efektywności inwestycji. Wyzwania Teorii i potrzeby praktyki*. Wydanie III. Warszawa, Wolters Kulwer.
- Suwart, K. *Getback - historia afery, która wstrząsnęła całą Polską*. <https://www.money.pl/gospodarka/getback-historia-afery-ktora-wstrzasnela-cala-polska-6409244162922113a.html>
- Trugman, G.R. 2012. *Understanding Business Valuation. A Practical Guide to Valuing Small and Medium Sized Businesses*. New York, AICPA.
- Wiśniewski, T., Zarzecki, D. 1995. Investment appraisal practice in Poland. 18th Annual Congress of the European Accounting Association, Programme and Collected Abstracts, Birmingham.
- Wnuk-Pel, T. 2014. The Practice and Factors Determining the Selection of Capital Budgeting Methods – Evidence from the Field. *Procedia – Social and Behavioral Sciences*, 156, 612-616.
- Wnuk-Pel, T. 2015. Factors determining the selection of capital budgeting methods in companies operating in Poland. *Zeszyty Teoretyczne Rachunkowości*, 84(140), 217-240.
- Zarzecki, D. 2016. Determination of the Risk-Free Rate in the Income Approach. In: *Contemporary Issues and Challenges of the Organization Management Process. Models-Implementation-Interrelation*. Ed. A. Jaki, T. Rojek, Cracow University of Economics.
- Zarzecki, D. 2019. Kluczowe wyzwania w estymacji kosztu kapitału. In: *Polityka pieniężna i rynki finansowe wobec wyzwań gospodarki 4.0*, Editor W. Przybylska-Kapuścińska, Warsaw: CeDeWu, 225-240.

Notes:

- 1 See, *Levy and Sarnat (1990); Lumby (1991); Pike and Neale (1993); Abdullah and Nordin (2008); Al Rahahleh and Mukherjee (2013); Markovics (2016); Brealey, Myers and Marcus, (2017)*.
- 2 See, *Levy, Sarnat (1990)*.
- 3 See, *Graham, Harvey (2002)*.
- 4 See, *Block (1997)*.
- 5 See, *Zarzecki (2016)*.
- 6 See, *Zarzecki (2019)*.
- 7 See, *Kasper (2008); Trugman, (2012)*.
- 8 See, *Fernandez (2017)*.
- 9 For example, the scandal related to Getback, which issued toxic bonds and turned out to be a threat to the stability of the entire market. See, *Suwart (2019)*.