

DERIVATIVES IN CURRENCY RISK MANAGEMENT IN NON-FINANCIAL ENTITIES

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Purpose: The aim of the article is presentation of the practical use of derivative instruments for the purposes of currency risk management on the example of non-financial stock exchange entities whose financial instruments are classified within the WIG20 index on the Warsaw Stock Exchange.

Design/methodology/approach: The basis for achieving the assumed objective was literature studies, a review of external research results and an analysis of the financial statements of selected non-financial entities through the prism of currency risk management systems and currency derivatives used.

Findings: Based on the conducted research, it was observed that the vast majority of the entities surveyed have currency risk management systems in place. Within their framework, currency risk is identified, exposure to its effects is determined, and counteract its consequences. It was established that currency derivatives are the basic tool for transferring currency risk.

Research limitations/implications: The presented research is a preliminary analysis. The conducted considerations focused on the group of selected non-financial entities, which limits the possibilities of evaluating the results and generalizing the conclusions. However, this study provides a basis for further research.

Practical implications: In the case of identifying currency risk, the companies surveyed focus primarily on cash flow hedging. OTC (Over-the-counter) currency derivatives are a more popular currency risk management tool among the surveyed entities. This is due to the greater possibilities of adapting the instrument's terms to the specifics of a given entity.

Originality/value: The article partly fills the research gap in empirical studies on the using foreign exchange derivatives in currency risk management by non-financial firms in Poland. The conclusions formulated may find theoretical and practical application in analyzed scope.

Keywords: risk, currency risk, currency risk management, currency derivative.

Category of the paper: research paper.

1. Introduction

Risk is an indispensable part of business in the modern-day environment of internationalisation, globalisation and technical advance. The transformations observed over the past few years have been reflected both in the type and scale of those risks. Foreign exchange risk has specific effects in that field. For that reason, organisations are more interested in restricting the harmful effect on their property, finances and financial performance. Derivatives are among the major tools to secure business against foreign exchange risk. This is evidenced by their popularity among companies. Considering the relevance and significance of that issue, this paper will describe the use of derivatives in foreign exchange risk management among enterprises. Due to the specifics of the financial sector, the presented analysis will not include companies in that group. In this regard, the purpose of this study is to describe the practical use of derivatives in risk management as illustrated by the case of non-financial stock exchange companies whose financial instruments participate in the main WIG20 index at the Warsaw Stock Exchange. The study has been conducted using descriptive method, comparative method, and based on literature analysis, external research results analysis and financial statement analysis.

2. Literature review

Foreign exchange risk is a complex term with no uniform interpretation in the accessible literature, which is the evidence of its multi-aspect character (Bień, 2008, p. 304; Dziawgo, 2010, p. 52; Kalinowski, 2012, p. 37; Coyle, 2013, p. 2). Major significance of that risk in the current business environment results in multiple initiatives aimed at risk management. This leads to practical popularisation of various foreign exchange risk management methods. The main goal is to minimise the effect of exchange rate fluctuations on the variability of company operating cash flows, and thus to reduce the probability of occurrence of financial problems, leading to bankruptcy (Alvarez-Diez, Alfaro-Cid, Fernandez-Blanco, 2016, p. 2).

Foreign exchange risk management is a multi-stage process, encompassing many correlated actions. The literature does not provide a uniform description of particular activities. There are noticeable discrepancies, mainly in the depth of analysis, reflected in the number of stages, as well as description and scope of activities belonging to individual phases (Filipiak, 2017, p. 11; Kowalik, Kustos, 2015, p. 26; Puszer, Czech, Szewczyk, 2022, pp. 53-55).

Current economic conditions, characterised by the common variability of exchange rates, cause a growing interest in the use of derivatives to secure against foreign exchange risk. The use of derivatives to ensure financial security is referred to as financial hedging or hedging.

The described problem has multiple references in source literature, quite often indicating a multi-factor character (Rogalski, Seward, 1991, pp. 364-366; Broll, Wahl, Zilcha, 1995, pp. 667-668; Allayannis, Ofek, 2001, pp. 294-295; Hagelin, Pramborg, 2004, pp. 15-16; Pawłowski, 2018, pp. 360-364). There are multiple studies describing that issue in a general perspective, or focusing on chosen aspects, including the selection and use of individual types of derivatives for foreign exchange risk management, the effect of implemented hedging strategy on chosen financial aspects of the company, evaluation of effectiveness, changes in risk exposure, effect on goodwill or tax considerations (Bae, Kim, Kwon, 2018, pp. 446-448; Panaretou, Shackleton, Taylor, 2013, pp. 116-118). The complexity of the issue is further increased by the ambiguity of results of studies concerning the usage of derivatives to prevent foreign currency risk in companies. There are many available studies that confirm the positive effect of hedging in the analysed field (Bartram, Brown, Conrad, 2011, pp. 997-998; Allayannis, Ofek, 2001, pp. 294-295; Clark, Judge, 2009, pp. 637-638), however, certain studies describe concerns regarding the effectiveness of hedging against foreign currency risk (Guay, Kothari, 2003, pp. 452-453). This entails the attempts to present a detailed analysis of the effects of hedging in the described field on individual aspects of business. Owing to the specifics of the problem, the major trends include assessment of effects of actions taken to secure against foreign exchange risk. W. Guay has highlighted the effect of derivatives on the reduction of foreign exchange risk. However, in his studies, scale of the reduction varied and depended on certain factors. He also pointed out the significance of choosing a proper type of derivative, considering the hedging policy implemented by the organisation, as well as particular expectations (Guay, 1999, pp. 348-349). Other analyses performed by S. Bartram, G. Brown and J. Conrad have led to a formulation of certain conclusions regarding the described problem. Firstly, they confirmed that in most cases derivatives hedging against foreign exchange risk had been used in companies with higher exposure to that risk. Additionally, they have noticed that both the motive and the effect of those activities were: reducing the level of systematic risk, including foreign exchange risk, idiosyncratic variance as well as cash flow fluctuations. This can lead to a drop of the risk factor for a given organisation, which results in lowering the capital cost (Bartram, Brown, Conrad, 2011, pp. 997-998).

Another study on the described problem, conducted by L. Hentschel and S. Kothari, leads a conclusion that non-financial companies are more eager to use derivatives to hedge against foreign exchange risk, while financial enterprises are more often interested in transferring interest rate risk by using derivatives. Furthermore, they questioned the existence of a clear correlation between the use of foreign exchange derivatives and the reduction of risk of exchange rate fluctuation (Hentschel, Kothari, 2001, pp. 116-117).

Another interesting aspects of previous analyses is the relation of hedging policy implementation within the organisation and goodwill changes. G. Allayannis and J. Weston indicate that the implementation of foreign exchange hedging in an organisation was clearly followed by a goodwill increase. They also emphasised that discontinuation of that practice

resulted in a noticeable reduction of the organisation's goodwill (Allayannis, Weston, 2001, pp. 273-274).

J. Graham i D. Rogers highlighted the costs of organisation involvement in using derivatives and related tax benefits. Due to a relatively low cost of forward transactions, most analysed companies claimed that tax benefits received as a result of foreign exchange hedging strategy implementation exceeded their financial burden (Graham, Rogers, 2002, p. 837).

A major issue related with the use of derivatives to secure effectively against foreign exchange risk, is proper selection of tools. A wide selection of foreign exchange derivatives is currently available on the financial market (Dempsey, 2021, pp. 106-138). Over the last few years, efforts have been made to identify and assess different types of financial instruments and strategies, as well as their usage, in the context of hedging against the analysed type of risk (Maurer, Valiani, 2003, pp. 1-2, 25-26; Alvarez-Diez, Alfaro-Cid, Fernandez-Blanco, 2016, pp. 3, 7). The findings of these studies show that the most popular instrument were over-the-counter derivatives, including currency forward transactions, foreign-exchange options and currency swaps (Papaioannou, 2006, pp. 142-143; Bodnar et al., 2013, p. 907). It should be noted that the purpose of forward transactions is quite often hedging against foreign exchange risk exposure resulting from contractual obligations of the parties. As far as foreign-exchange options are concerned, it has been noticed that the major reason for using them was to secure tentative cash flows denominated in foreign currencies, that are often characterised by longer period of fulfilment and economic exposure coverage necessity (Papaioannou, 2006, pp. 142-143). Currency futures, because of their specifics, in particular limited capability to adjust financial instrument conditions to individual expectations, are relatively less popular as a forward instrument. However, they are easier to use, which promotes their implementation in hedging strategies against foreign exchange risk (Wróblewska, 2016, pp. 193-199). It is noteworthy that despite better capability to control the risk with forward transactions, due to their better adjustment to companies' expectations, these tools are more difficult to apply. The condition for settlement on the expiry date of the contract causes the necessity to use further hedging tools in order to maintain the financial result achieved within the effective period of the instrument, in particular to reduce the interest rate risk (Lioui, Poncet, 2002, pp. 261-262). Considering the relevance and significance of these issues, this paper contains an analysis of practical implementation of foreign exchange derivatives among non-financial organisations.

3. Materials and methods

The assumed goal of the study was the analysis of foreign exchange risk management systems in non-financial entities as well as identification of derivatives used for that purpose. Consequently, the study encompassed leading stock-listed non-financial companies whose

financial instruments participated in the main WIG20 index at the Warsaw Stock Exchange. The analysis concerned 13 organisations that fulfilled particular conditions. Due to their character, these companies operate within extensive capital groups, thus consolidated yearly financial statements have been considered. It should be noted that yearly financial statements did not cover calendar years in all analysed companies. Therefore, the survey covered:

- financial statements of 2022 (organisations in which financial year is calendar year),
- financial statements covering a period starting in 2022 and ending in 2023 (organisations in which financial year is different than calendar year).

Table 1 lists entities whose financial statements have been taken into account in the analysis and indicated the financial year of the financial data as well as major sector of activity.

Table 1.

List of non-financial entities covered by the survey

No.	Parent company	Major field of activity	Financial year
1	ALLEGRO.EU S.A.	e-commerce	01 Jan 2022 to 31 Dec 2022
2	BUDIMEX SA	construction	01 Jan 2022 to 31 Dec 2022
3	CD PROJEKT SA	video games developer	01 Jan 2022 to 31 Dec 2022
4	CYFROWY POLSAT SA	media and telecommunication	01 Jan 2022 to 31 Dec 2022
5	DINO POLSKA SA	commercial	01 Jan 2022 to 31 Dec 2022
6	GRUPA KĘTY SA	aluminium processing	01 Jan 2022 to 31 Dec 2022
7	JASTRZĘBSKA SPÓŁKA WĘGLOWA SA	mining	01 Jan 2022 to 31 Dec 2022
8	KGHM POLSKA MIEDŹ SA	mining	01 Jan 2022 to 31 Dec 2022
9	LPP SA	fashion	01 Feb 2022 to 31 Jan 2023
10	ORANGE POLSKA SA	telecommunication	01 Jan 2022 to 31 Dec 2022
11	ORLEN SA	petrochemiczny	01.01.2022 - 31.12.2022
12	PEPCO GROUP N.V.	handlowy	01.10.2022 - 30.09.2023
13	PGE POLSKA GRUPA ENERGETYCZNA SA	energetyczny	01.01.2022 - 31.12.2022

Zródło: own elaboration.

4. Results and discussion

The structure of the study enabled assessment of four major factors related with foreign exchange risk management in individual organisations. They were:

- major sources of exposure to foreign exchange risk,
- foreign exchange risk management goals,
- exchange rates hedged with derivatives,
- types of foreign exchange derivatives used.

Detailed findings concerning the identification of main sources of exposure to foreign exchange risk and foreign exchange risk management goals in the analysed companies are presented in Table 2. Based on the provided data, it has been determined that 12 out

of 13 analysed organisations identified foreign exchange risk and its major sources. In most cases, these were revenues from the sales of goods on foreign markets in foreign currencies, as well as expenses related with the purchase of materials, goods and services in foreign currencies. It has been observed that results of operating activity in the analysed organisations were particularly affected by the changes in the worth of euro (EUR) and US dollar (USD). A relatively smaller influence has been observed with the Swiss franc (CHF), pound sterling (GBP), Canadian dollar (CAD), Australian dollar (AUD), Czech crown (CZK) and Chinese yuan (CNY).

Another factor analysed in the course of the study were foreign exchange management goals in particular entities. It has been determined that all organisations implementing the foreign exchange risk management system (among those participating in the survey) used it mainly to secure their cash flows in order to reduce the effect of exchange rate variability on their financial results (12 organisations). Additionally, it has been found that the main assumption in one company was to reduce the risk of fair value changes, while the other emphasized the necessity to ensure proper financial liquidity and flexibility.

Table 2.

Summary of information on currency risk exposure and foreign exchange risk management objectives in the analyzed organisations

No.	Parent company	Exposure to foreign exchange risk	Foreign exchange risk management goals
1	Allegro.eu SA	The source of foreign exchange risk is the purchase of foreign company shares (EUR).	Securing cash flows to reduce potential negative effect of exchange rates variation on their financial results.
2	Budimex SA	Construction contracts with investors and contracts with subcontractors and suppliers settled in foreign currencies (EUR and CHF).	Securing future cash flows resulting from these contracts in order to reduce the effect of exchange rates fluctuation on the financial results. Each contract with payable value (revenue or expenses) in foreign currency that is deemed significant, will be secured.
3	CD Projekt SA	Most publishing and distribution contracts of the company (game developer) are settled in foreign currencies. Revenues are mainly generated in USD, EUR, PLN, GBP, CAD and AUD, while costs are covered mainly in USD and PLN.	Securing cash flows related with effective or future commercial transactions in foreign currencies. Generally, hedging transactions are set with the gross value of foreign currency exposure, that is the full amount of a given cash flow in future.
4	Cyfrowy Polsat SA	Revenues are generally received in PLN. Major part of the costs and capital expenditures is settled in foreign currencies. These are, in particular, licence fees towards broadcasting companies (USD, EUR), satellite capacity lease contracts (EUR), conditional access system fees (EUR, USD), purchase of materials and goods (EUR and USD).	Securing cash flows to reduce the effect of negative factors on the financial results.

Cont. table 2.

5	Dino Polska SA	Company policy does not include foreign exchange risk in the risk management process.	The risk management process does not cover foreign exchange risk.
6	Grupa Kęty SA	The Group settles their revenue and expenses in several major currencies (PLN, EUR, GBP and USD). The balance of foreign currency revenue and expenses is mostly positive for EUR and negative for USD. Foreign exchange risk occurs with the purchase of raw materials and sales of products in foreign currencies, and also in connection with the purchase of tangible assets in foreign currencies.	Securing future cash flows against exchange rate risk resulting from the operating, investment and financial activity. Revenues and expenses in other currencies have no significant effect on the risk within the Group.
7	Jastrzębska Spółka Węglowa SA	The planned, contractual sales of goods and products whose price is indexed or denominated in other currencies than PLN (mainly EUR and USD).	Securing cash flows to reduce the effect of exchange rates variation on their financial results.
8	KGHM Polska Miedź SA	The organisation distinguishes two types of foreign exchange risk exposure: transactional and functional. The major sources of transactional exposure, related with the variability of cash flow value in base currency, include revenues from the sales of metals (USD). Functional exposure, that relates to the variability of values of particular base currency items in the financial statement, concerns specifically trading receivables and liabilities denominated in foreign currencies, financial receivables from loans in foreign currencies, financial liabilities from debt in foreign currencies, cash in foreign currencies and derivatives (USD).	Securing cash flows in order to reduce net value variability, caused by periodical changes in the pricing of foreign exchange hedging transactions.
9	LPP SA	The source of foreign exchange risk in the organisation are mainly sales and purchase transactions, mostly settled in foreign currencies. For commercial goods purchase, dominant exposure to USD worth change risk is noticeable. Additionally, exposure to exchange rate risk is identified, related with settlement of commercial spaces rent (EUR).	Securing cash flows to reduce the effect of exchange rates variation on their financial results.
10	Orange Polska SA	Foreign exchange risk is related with financial assets and liabilities denominated in foreign currencies, in particular with purchase of materials and goods (EUR, USD), as well as leasing liabilities (EUR).	Cash flow hedging and ensuring proper financial liquidity and flexibility by reducing negative effect of exchange rate fluctuation on financial results.
11	Orlen SA	The major sources of foreign exchange risk include: <ul style="list-style-type: none"> – revenues and expenses indexed and denominated in foreign currencies (USD, EUR), – foreign currency investments (USD, EUR), – probable liabilities and receivables in foreign currencies (USD, EUR), – assets and liabilities, including debt obligations, denominated in foreign currencies (USD, EUR). 	Securing cash flows and reducing the risk of changes in the fair value.
12	Pepco Group N.V.	Most goods and materials purchase transactions are made directly with foreign partners, particularly from the Far East (USD, CNY).	Securing cash flows to reduce the effect of exchange rates variation on their financial results.

Cont. table 2.

13	PGE Polska Grupa Energetyczna SA	The basic source of exposure to foreign exchange risk (EUR, USD) include: <ul style="list-style-type: none"> – investment expenditures denominated/indexed according to foreign currency exchange rates, – debt denominated in foreign currencies, – sales and purchase of electric energy denominated in foreign currencies, – purchase and sales of CO₂ emission allowances (forward contracts), gas, coal and other fuels, denominated/indexed according to foreign currency exchange rate, – expenses related with current usage of production consumables, denominated/indexed according to foreign currency exchange rate, – financial assets denominated in foreign currencies. 	Securing cash flows to reduce the effect of exchange rates variation on their financial results.
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Źródło: own elaboration.

Specific data concerning hedged exchange rates and types of derivatives used in the analysed organisations are presented in Table 3.

Table 3.

Summary of information on hedged exchange rates and currency derivatives used in the analyzed companies

No.	Parent company	Hedged exchange rates	Walutowe instrumenty pochodne
1	ALLEGRO.EU S.A.	EUR/PLN	Deal Contingent FX Forward
2	BUDIMEX SA	EUR/PLN CHF/PLN	FX Forward Foreign-exchange option
3	CD PROJEKT SA	USD/PLN EUR/PLN	Currency forward
4	CYFROWY POLSAT SA	EUR/PLN USD/PLN	Currency forward
5	DINO POLSKA SA	Company does not secure exchange rates	Company does not use foreign exchange derivatives.
6	GRUPA KĘTY SA	EUR/PLN GBP/PLN USD/PLN	Currency forward
7	JASTRZĘBSKA SPÓŁKA WĘGLOWA SA	USD/PLN EUR/PLN	FX Forward
8	KGHM POLSKA MIEDŹ SA	USD/PLN	Option structure Corridor Option structure Seagull Currency option Currency forward Currency interest rate swap (CIRS)
9	LPP SA	USD/PLN	Forward walutowy
10	ORANGE POLSKA SA	EUR/PLN USD/PLN	Currency forward Currency option Currency swap Currency interest rate swap
11	ORLEN SA	EUR/PLN USD/PLN EUR/USD EUR/CZK	Currency forward Currency swap

Cont. table 3.

12	PEPCO GROUP N.V.	USD/PLN EUR/PLN CNY/PLN EUR/USD EUR/CNY	Currency forward
13	PGE POLSKA GRUPA ENERGETYCZNA SA	EUR/PLN USD/PLN	Currency forward Cross-currency interest rate swap (CCIRS)

Źródło: own elaboration.

The survey data indicate that 12 companies used foreign exchange derivatives in their currency risk management processes. Only one organisation in the analysed group did not implement foreign exchange risk management and did not make derivatives transactions in that field. In most cases foreign exchange derivatives were used for hedging against exchange rate risk exposure related with negative changes in currency exchange rates EUR/PLN (10 organisations) and USD/PLN (10 organisations). Beside that, analysed companies hedged exchange rates of other currency pairs: EUR/USD (2 companies), CHF/PLN (1 company), GBP/PLN (1 company), CNY/PLN (1 company) EUR/CZK (1 company), EUR/CNY (1 company).

Another analysed aspect were types of foreign exchange derivatives used in the surveyed period. Based on the presented data, it has been found that all organisations implementing foreign exchange risk management in the analysed group, used derivatives defined as currency forward contracts. They were reported as currency forward, FX Forward and Deal Contingent FX Forward. Involvement in currency options (3 organisations), currency interest rate swaps and cross-currency interest rate swaps (3 organisations) and currency swaps (2 organisations) is also worth noting. One company used advanced FX option structures in the Corridor and Seagull variants, encompassing both call and put options in different items with various conditions.

5. Summary

The analysis presented in this study, concerning the use of derivatives in the leading stock-listed non-financial organisations for the purposes of foreign exchange risk management, has provided significant information and led to quite interesting conclusions. The findings of the survey confirm that the majority of the analysed companies identified foreign exchange risk and determined exposure to its effects. It is achieved within the implemented foreign exchange risk management systems. It has been found that the basic purpose of those systems is hedging cash flows in order to reduce the effect of exchange rate fluctuations on the company financial results. In this context, analysed organisations used foreign exchange derivatives, serving as the basic tools to transfer the risk. In particular, these include forward contracts, which confirms

the findings of the previous research indicating their popularity. However, to a relatively lesser extent, the analysed companies concluded other currency derivatives transactions: currency swaps, currency interest rate swaps, cross-currency interest rate swaps, and even complex option structures.

In summary, foreign exchange derivatives serve as an important tool in the economic practice, allowing to hedge against foreign exchange risk. However, it should be noted that the described analysis was clearly limited, thus the presented conclusions might not be fully generalised. Nonetheless, these findings are valuable and can support further research on this issue.

References

1. Allayannis, G., Ofek, E. (2001). Exchange Rate Exposure, Hedging and the Use of Foreign Currency Derivatives. *Journal of International Money and Finance*, 20, pp. 273-296, [https://doi.org/10.1016/S0261-5606\(00\)00050-4](https://doi.org/10.1016/S0261-5606(00)00050-4)
2. Allayannis, G., Weston, J.P. (2001). The use of foreign currency derivatives and firm market value. *Review of Financial Studies*, 14, pp. 243-276, <https://doi.org/10.1093/rfs/14.1.243>
3. Alvarez-Diez, S., Alfaro-Cid, E., Fernandez-Blanco, M.O. (2016). Hedging foreign exchange rate risk: Multi-currency diversification. *European Journal of Management and Business Economics*, 25, pp. 2-7, <https://doi.org/10.1016/j.redee.2015.11.003>
4. Bae, S.C., Kim, H.S., Kwon, T.H. (2018). Currency derivatives for hedging: New evidence on determinants, firm risk, and performance. *Journal of Futures Markets*. 38, pp. 446-467, <https://doi.org/10.1002/fut.21894>
5. Bartram, S.M., Brown, G.W., Conrad, J. (2011). The effects of derivatives on firm risk and value. *Journal of financial and quantitative analysis*, Vol. 46, No. 4, pp. 967-999, <https://doi.org/10.1017/S0022109011000275>
6. Bień, W. (2008). *Zarządzanie finansami przedsiębiorstwa*. Warszawa: Difin.
7. Bodnar, G.M., Consolandi, C., Gabbi, G., Jaiswal-Dale, A. (2013). Risk Management for Italian Non-Financial Firms: Currency and Interest Rate Exposure. *European Financial Management*, Vol. 19, No. 5, pp. 887-910, <https://doi.org/10.1111/j.1468-036X.2012.00659.x>
8. Broll, U., Wahl, J.E., Zilcha, I. (1995). Indirect hedging of exchange rate risk. *Journal of International Money and Finance*, Vol. 14, No. 5, pp. 667-678, [https://doi.org/10.1016/0261-5606\(95\)00019-B](https://doi.org/10.1016/0261-5606(95)00019-B)

9. Clark, E., Judge, A. (2009). Foreign currency derivatives versus foreign currency debt and the hedging premium. *European Financial Management*, 15, pp. 606-642, <https://doi.org/10.1111/j.1468-036X.2007.00431.x>
10. Coyle, B. (2013). *Hedging currency exposures*. Oxon: Routledge.
11. Dempsey, M. (2021). *Financial risk management and derivative instruments*. Oxon: Routledge.
12. Dziawgo, D. (2010). *Credit rating na międzynarodowym rynku finansowym*. Warszawa: PWE.
13. Filipiak, A. (2017). Identyfikacja ryzyka walutowego oraz metody jego ograniczania na przykładzie kontraktów typu forward. *Zeszyty Naukowe WSG, t. 31, seria: Ekonomia, no. 9*, pp. 7-20, [10.15290/ose.2017.06.90.14](https://doi.org/10.15290/ose.2017.06.90.14)
14. Graham, J.R., Rogers, D. (2002). Do firms hedge in response to tax incentive? *Journal of Finance*, 57, pp. 815-840, <https://doi.org/10.1111/1540-6261.00443>
15. Guay, W. (1999). The impact of derivatives on firm risk: An empirical examination of new derivatives users. *Journal of Accounting and Economics*, 26, pp. 319-351, [https://doi.org/10.1016/S0165-4101\(98\)00032-9](https://doi.org/10.1016/S0165-4101(98)00032-9)
16. Guay, W., Kothari, S. (2003). How much do hedge with derivatives? *Journal of Financial Economics*, 70, pp. 423-461, [https://doi.org/10.1016/S0304-405X\(03\)00179-X](https://doi.org/10.1016/S0304-405X(03)00179-X)
17. Hagelin, N., Pramborg, B. (2004). Hedging Foreign Exchange Exposure: Risk Reduction from Transaction and Translation Hedging. *Journal of International Financial Management and Accounting, Vol. 15, Iss. 1*, pp. 1-20, <https://doi.org/10.1111/j.1467-646X.2004.00099.x>
18. Hentschel, L., Kothari, S.P. (2001). Are corporations reducing or taking risks with derivatives? *Journal of Financial and Quantitative Analysis*, 36, pp. 93-118, <https://doi.org/10.2307/2676199>
19. Kalinowski, M. (2012). *Zarządzanie ryzykiem walutowym w przedsiębiorstwie*. Warszawa: CeDeWu.
20. Kowalik, P., Kustos, M. (2015). *Ryzyko kursowe*. Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu.
21. Lioui, A., Poncet, P. (2002). Optimal currency risk hedging. *Journal of International Money and Finance*, 21, pp. 241-264, [https://doi.org/10.1016/S0261-5606\(01\)00045-6](https://doi.org/10.1016/S0261-5606(01)00045-6)
22. Maurer, R., Valiani, S. (2003). Hedging the Exchange Rate Risk in International Portfolio Diversification: Currency Forwards versus Currency Options. *Working Paper Series: Finance & Accounting, No. 109*, pp. 1-31.
23. Panaretou, A., Shackleton, M.B., Taylor, P.A. (2013). Corporate Risk Management and Hedge Accounting, *Contemporary Accounting Research, Vol. 30, No. 1*, pp. 116-139. [doi:10.1111/j.1911-3846.2011.01143.x](https://doi.org/10.1111/j.1911-3846.2011.01143.x)
24. Papaioannou, M. (2006). Exchange Rate Risk Measurement and Management: Issues and Approaches for Firm. *South-Eastern Europe Journal of Economics*, 2, pp. 129-146.

25. Pawłowski, J. (2018). Wykorzystanie instrumentów pochodnych przez przedsiębiorstwa niefinansowe w opinii inwestorów i analityków giełdowych w Polsce. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, no. 531, pp. 357-367. doi:10.15611/pn.2018.531.32
26. Puszer, B., Czech, M., Szewczyk, Ł. (2022). *Zarządzanie ryzykiem kursowym w przedsiębiorstwie*. Katowice: Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach.
27. Rogalski, J.R., Seward, J.K. (1991). Corporate issues of foreign currency exchange warrants. *Journal of Financial Economics*, 30, pp. 347-366, [https://doi.org/10.1016/0304-405X\(91\)90036-J](https://doi.org/10.1016/0304-405X(91)90036-J)
28. Skonsolidowane sprawozdanie finansowe GK PGE za 2022 r.
29. Skonsolidowane sprawozdanie finansowe Grupy Budimex za rok zakończony 31 grudnia 2022 r.
30. Skonsolidowane sprawozdanie finansowe Grupy Kapitałowej CD Projekt za 2022 r.
31. Skonsolidowane sprawozdanie finansowe Grupy Kapitałowej Dino Polska S.A. za rok zakończony 31 grudnia 2022 r.
32. Skonsolidowane sprawozdanie finansowe Grupy Kapitałowej Grupa Kęty S.A. za okres od 1 stycznia 2022 do 31 grudnia 2022 r.
33. Skonsolidowane sprawozdanie finansowe Grupy Kapitałowej Jastrzębskiej Spółki Węglowej S.A. za rok obrotowy zakończony 31 grudnia 2022 r.
34. Skonsolidowane sprawozdanie finansowe Grupy Kapitałowej KGHM Polska Miedź S.A. za 2022 r.
35. Skonsolidowane sprawozdanie finansowe Grupy Kapitałowej Orange Polska za rok zakończony 31 grudnia 2022 r.
36. Skonsolidowane sprawozdanie finansowe Grupy ORLEN za rok zakończony 31 grudnia 2022 r.
37. Skonsolidowane sprawozdanie finansowe Grupy PEPCO za rok zakończony 31 grudnia 2022 r. za okres od 1 października 2022 do 30 września 2023 r.
38. Skonsolidowany raport roczny GK LPP SA za 2022/2023.
39. Skonsolidowany raport roczny Grupy Allegro.eu za rok zakończony 31 grudnia 2022 r.
40. Skonsolidowany raport roczny Grupy Kapitałowej Cyfrowy Polsat SA za rok obrotowy zakończony 31 grudnia 2022 r.
41. Wróblewska, K. (2016). Kontrakty futures w zarządzaniu ryzykiem walutowym w przedsiębiorstwie. *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 267, pp. 189-200.