INTERDISCIPLINARY APPROACH FOR DETERMINING THE ESSENCE OF DERIVATIVES

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Abstract. *The research of key aspects of transactions with derivatives in different spheres was conducted. Particularly have been analyzed fundamental approaches to the description of how futures market works, influence of hedging with derivatives on the company's value, significant aspects of accounting, taxations and legal qualification of transactions with derivatives. As a result it was noted that each area may be important for the company and should be taken into account. The essence of transactions with derivatives and related risks will be understood better, if the company's staff relies on the interdisciplinary approach, which is proposed in the article.*

Keywords: derivatives, hedging, interdisciplinary approach, futures markets.
JEL classification: G10, G30

Introduction.

Derivatives are the special type of financial instruments that assume an agreement to make a transaction in the future at a pre-determined price. The specific feature of such transaction is that there is no requirement to transfer the entire transaction amount at the time of reaching an agreement, but at the expiration date derivative contract becomes the company's obligation to deliver the underlying asset or pay the difference between the actual price of the underlying asset and the pre-determined contract price. The absence of cash flows under the contract until the expiration date causes difficulties for determining tax liabilities, reflecting the results in accounting system and legal qualification of such transactions. Also, the investors are more likely to expect that the company will be engaged in its direct activities, without making risky futures transactions in non-core markets. However, despite all the difficulties and increased risk, derivatives are widely spread around the world and play significant role in the global financial system.

In such case it should be noted that the practice of derivatives usage in the company is not limited only by the development of hedging or trading strategy. Transactions with derivatives have economic, accounting, tax and legal consequences that can have significant impact on the company's operations. It may be difficult for managers, who are not familiar with the derivatives market, to understand all the essential aspects of the derivatives world and organize such work of all responsible departments, which provides the risk of derivatives usage at an acceptable level. In this regard, it will be relevant to apply interdisciplinary approach for determining the essence of derivatives, which would briefly but succinctly take into account the key characteristics identified in various areas and their relationship to each other. The article provides the development of such approach. To do this, three research questions were answered.

a. How the derivatives market works, why derivatives are necessary, what benefits brings the usage of derivatives to the company; in particular what gives hedging risks with derivatives.

b. What are the key characteristics of derivatives in the field of accounting and taxation, legal regulation, and how the various fields of derivatives application are related to each other.

c. How to structure research in the field of derivatives into one short but concise ap-proach that will give understanding of the key characteristics of derivatives.

This article supplements the basic literature on derivatives, where, from the author's point of view, not enough attention is paid to issues that arise in the accounting, tax and legal spheres. The focus in this literature is usually made on the description of instruments, pricing and possible strategies for derivatives usage. Works in the field of derivatives without mathematical techniques and quantitative risk management models are less common, but in some cases it may be useful. The proposed interdisciplinary approach to determining the essence of derivatives will allow managers to understand the essence of the derivatives market better, and may be used in the organization and distribution of responsibilities between departments. Since in work with derivatives it is important not only to conclude profitable transactions, but also to process, control and complete risk management procedures for these transactions. Interdisciplinary approach will allow employees of different departments understand what characteristics of derivatives will be important for related departments of the company, and for managers – to get a comprehensive understanding of what derivatives can give their company, and what risks are associated with it.

For this purpose general scientific research methods were used: analysis, synthesis, generalization, induction, deduction, observation. Methods of theoretical research: idealization, formalization, method of logical analysis, classification.

Main text.

The emergence and further spread of derivatives in the market often coincides with increasing price risk in this market. For example, a year after the abolition of the gold standard in 1971 (the transition to floating exchange rates), the Chicago Mercantile Exchange (CME) began trading futures for seven currencies. Since 1978 the natural gas market has also been gradually deregulated, as a result increased volatility lead to the introduction of natural gas futures in 1990 (McDonald, 2013, Chapter 1) [10]. Also, Jacques (2015) notes that since 1971 there has been an explosive growth of innovation in the field of financial instruments: until that time derivatives usage was more associated with commodities [9]. Derivatives play an important role in the modern world economy; they are powerful and flexible type of financial instruments at the same time (Shaik, 2013, Chapter 1) [13]. How do the derivatives market work?

If we consider the economy in the time context, it will be presented only as a sum of two segments: the spot and futures markets (Burenin, 1997). J. M. Keynes and J. R. Hicks can be attributed to the founders of the theoretical analysis of the futures market; they were in the first row of scientists, who pointed out the importance of the development of this market [3].

Thus, in the "Treatise on money" Keynes (1931) points out that "... In the case of orga-nized markets for staple raw materials there exist at any time two price quotations – the one for immediate delivery, the other for delivery at some future date. If this price shows a profit on the costs of production, then manufacturer can go full steam ahead, selling his product forward and running no risk. If, on the other hand, this price does not cover the costs, then it cannot pay him to produce at all" [7]. Also, Hicks (1939) notes that "... an ordinary businessman enters into a futures contract only when this transaction allows him to reduce the risk that his current position brings to him. This will only happen in cases where he has somehow committed himself to making a sale or purchase on a given day, when he has already planned to make such sale or purchase, and when he has already taken certain actions that will make it difficult to implement his plan" [5]. Thus, the manufacturer of goods is interested in fixing future cash flows, or, in other words, in hedging price risk, therefore we can determine the first side of the futures market – hedgers, i.e. those companies that try to improve the efficiency of planning their activities through making transactions with derivatives.

On the other hand, in the "Treatise on monetary reform" Keynes (1923) considers the significance of speculations in the futures market. In his opinion, speculators play a positive role by performing objectively necessary economic functions: "Where risk is inevitable, it is much better, if it is beard by someone who is able or willing to bear it, than by someone who has neither the ability nor the desire to do it, and besides distracts him from the core business activity" [8]. Also, Hicks (1939), justifying the need for speculators in the futures market, notes that "... if the markets, where futures transactions are performed, united only hedgers, then there would be a tendency to relative sluggishness of demand in the market ... for any derivatives market the speculative element is necessarily characteristic" [5].

Also Kaldor (1960), examining the derivatives market in the work "Speculation and economic stability", which was included in a collection of his articles "Essays on economic stability and growth", describes the futures market participants in the same way as the previ-ous authors: "hedgers – are individuals who have certain commitments, independent from transactions on the derivatives market, like presence of stock of goods or obligation to pro-duce goods in the future, which requires raw materials; and who enter the derivatives market to reduce the risk arising from these obligations. ... Speculators, unlike hedgers, usually have only obligations related to futures transactions. When they enter the market, they take risks. ... An arbitrageur is the one who gets profit without risk" [6].

Thus, there will always be two sides in the futures market – hedgers and speculators. The derivatives market, unlike the spot market, assumes trading not the underlying asset it-self, but the risk of changes in its price. Wendy et al. (2017) describes it in the following way: derivatives allow you to trade risk without trading the underlying asset itself. In practice, this happens as follows: on the one hand, hedgers try to fix their cash flows through futures transactions and as a result – get rid of price or other similar type of risk, on the other – speculators, acting as the opposite party to these transactions, on the basis of fundamental and technical analysis, try to profit from fluctuations of market variables by taking on an increased risk. From time to time, there may also be third party – arbitrageurs, that is, those entities that extract additional profit without increased risk by exploiting the inefficiency of the markets [17].

Based on this short study of the theoretical foundations of the derivatives market func-tioning, it can be noted that the key aspect in managing derivatives in the company will be the division of market participants on hedgers and speculators, and, accordingly, definition the company’s role in this market. Because very often lack of clear distinction between speculative operations and hedging caused significant losses, which were complete surprise for top-management. As noted by Jacques (2015), most companies in the non-financial sector should not turn the finance department into a profit center, if they do not have special competence to work in speculative markets. If the financial department becomes a profit center, it is important to clearly separate trading operations from standard financial transactions and establish very strict monitoring procedures for such "hedge fund" [9].

The motivation of speculators who act as hedge funds and other professional traders is clear – they seek to obtain additional profit from changes in market variables by taking on the increased risk associated with trading derivatives. On the other hand, hedging with deriva-tives generates a number of questions about the necessity of usage such risk management tool. Hedging increases the predictability of future cash flows, but does this have a positive impact on the company's value?

The attitude to hedging with derivatives was influenced by Modigliani and Miller (1958). One of the essential provisions was that "the total market value of a firm does not depend on the

structure of its capital ... the value of the company is determined by the value of its assets, i.e., future cash flows and the required rate of return, and not by the way they are financed". Following this logic, the use of hedging should not affect the total value of the firm as well. However, the Modigliani-Miller model is based on a number of assumptions: the absence of taxes and transaction costs to attract a particular type of financing, the independence of the firm's cash flows from its financial policy (no bankruptcy costs), the ability of firms to perform financial transactions at the same prices and the availability of the same information for all economic agents [11].

Also Stulz (1996) notes, that academic theory suggests that some companies facing large exposures to interest rates, exchange rates, or commodity prices can increase their market values by using derivative securities to reduce their exposures. The primary emphasis of the theory is on the role of derivatives in reducing the variability of corporate cash flows and, in so doing, reducing various costs associated with financial distress. The actual corporate use of derivatives, however, does not seem to correspond closely to the theory [15].

Corporate managers have an intuitive sense that an effective risk management program contributes to shareholder value, but they typically find it difficult to measure or communicate the success of such a program (Stulz, 2013) [16].

Quite often, losses on derivative instruments with well-thought-out hedging are considered as a failure in the risk management system. Despite the fact that the company uses hedging because it cannot predict what result will bring an asset, liability or future cash flow, which is subject to market risk, in the future. And to avoid this uncertainty, organizations resort to hedging, while if the market movement is favorable for the company, then a compensating loss will be obtained from the hedging instrument (i.e. derivative). Therefore, hedging shouldn’t be considered only from the position of making profit or loss on the hedging instrument, it is also necessary to take into account the change in the value of the hedged item. Since the value of the hedged item and hedging instrument in an effectively constructed risk management system should move in opposite directions and provide the company with a stable level of income with a high probability, which in some cases can increase the market value of the company, however, it is difficult to trace a direct connection here. The direct impact can occur for a number of reasons:

− *taxes*: a progressive tax scale can make it profitable for firms to take positions in futures, forward or options markets (Smith and Stulz, 1985) [14]. The bulge in the tax curve can be caused not only by a gradual increase in marginal tax rates with taxable income, but also by restrictions on special tax items, such as the inability to carry losses forward or backward for an unlimited number of years (Aretz et al. 2007) [1];

− *operating costs of bankruptcy*: if the value of the company at the time of payment for its obligations is less than the amount of these obligations to be paid, the creditors of the company will not receive a part of their funds, that is, they will bear the costs of bankruptcy. The lower the expected bankruptcy costs, the higher the expected payments to the firm's lia-bility holders. By reducing the volatility of the firm's future value, hedging reduces the likelihood of bankruptcy costs (Smith and Stulz, 1985) [14];

− *reducing the risk of underinvestment*: hedging can solve the problem of lack of investment when managers of leveraged companies prefer not to invest in projects with positive NPV, since the return on investment almost entirely goes to bondholders. Hedging at the firm level potentially creates a stable cash flow, ensuring that project returns are less likely to fall below the initial investment plus liabilities to bondholders. As a result, the rate of return required by creditors and the probability of underinvestment will decrease (Aretz et al., 2007) [1].

At the moment, a number of empirical studies have been conducted on the impact of hedging on the company's value. The results are quite contradictory. It is caused by the specifics of each industry considered by authors and the corresponding time period. At the same time, the study of derivatives usage at the corporate level, conducted by Bartram (2017), notes that global studies (covering not only companies from the United States) on derivatives implementation both for hedging and speculation are very limited. M. Bartram in his research confirms the logical thesis that non-financial organizations are more likely to hedge risks arising from exchange rates, interest rates, or commodity prices than to take speculative positions in order to profit from short-term price fluctuations [2].

Thus, Modigliani and Miller demonstrated that in the ideal conditions, hedging does not lead to changes in the company's value, since shareholders can independently manage risks by diversifying their investment portfolio. Other authors have argued that the assumptions, which are mentioned above, will be the basis for applying hedging by a company that maximizes its value. Clearly for all sectors of the economy at different time intervals it is impossible to say whether hedging will affect the company's value or not. Therefore, Bartram (2017) rightly notes that "... most companies use derivatives from time to time based on their vision of the market at a particular situation" [2].

If we turn to the accounting aspects of derivatives usage, it can be noted, that derivatives are measured at fair value and the results of their revaluation affect profit indicator. This is GAAP and IFRS requirement. Revaluation of the fair value of derivatives for exchange traded instruments is performed daily by writing off or accruing variation margin, and for OTC instruments by the organization itself for at least all reporting dates, at the time of conclusion and at the time of expiration of the derivative. Constant revaluation of positions on derivatives increases the volatility of the profit indicator, which is one of the key indicators for evaluating the performance of the company. If derivatives are used to hedge market risks, the organization has the right to apply a special accounting technique - hedge accounting. Hedge accounting allows avoiding inconsistencies in the timing of recognition of gains or losses from the hedging instrument and hedged item.

Hedge accounting is a double-edged sword: from one hand, it can have positive impact by reducing the volatility of the profit indicator, on the other – the cost of using this accounting technique may exceed the expected effects of hedging (Ramirez, 2015, Chapter 13) [12]. When a company is contemplating hedge accounting for a specific hedge, careful analysis is required of the costs and benefits of its application. This can be a complex decision because the main benefit – the added value that comes from reduced earnings volatility – is difficult to measure in practice. In any case the implementation of hedge accounting should be controlled by top-management, because this, at a first glance only accounting, question can have significant influence on the whole company.

Taxation rules for derivatives may differ significantly in different jurisdictions. However, even in one jurisdiction, there may be differences between accounting and taxation of derivatives, which must be taken into account in order to avoid charges of tax evasion. In fact the tax legislation itself can create conditions for tax optimization using derivatives, but there are also fundamental theoretically justified situations when derivatives usage allows to company to reduce the amount of taxes paid [4]. These include situations when hedging is applied in conditions of a progressive tax scale and additional financing is attracted due to increased confidence in a company with hedged cash flows.

Obviously legal risk will be practically minimal when operations with derivatives are made through the exchange where contracts are already standardized and approved for trading and must comply with the law rules, also the fulfillment of obligations is guaranteed by the exchange as the central counterparty by charging the guarantee margin and calculating the daily variation margin.

Exchange-traded contracts may not serve all risk management needs and it may be rather expensive to hedge risk with such contracts. OTC derivatives are more flexible and may be customized to address any specific exposure of the company in one contract. But such flexibility is connected with a number of questions in legal area.

Due to the limited volume of the article, we won't describe all significant aspects in each considered area, but the conducted analysis shows that derivatives bring complexity to any sphere. The results of the study can be summarized in the form of the proposed interdisciplinary approach for determining the essence of derivatives. It is presented in figure 1.

According to the proposed interdisciplinary approach for determining the essence of derivatives, they are instruments of the futures market, where, unlike at the spot market, the underlying asset itself is not traded, but the risk of changes in its price. In the futures market, there will always be two parties with different goals: hedgers and speculators. Under ideal conditions, hedging does not lead to changes in the company's market value, but the limitations of real life theoretically make hedging attractive to the company. In practice, organizations use derivatives based on their vision of the market and the current situation. As a general rule, the results of operations on the futures market are reflected in the financial statements in the profit or loss item of the income statement. This reflects the fair value of derivatives, which at the time of the transaction is usually zero and then begins to change under the influence of changes in the price of the underlying asset. Revaluation of fair value for accounting purposes is provided for all derivatives, except those for which special accounting technique – hedging accounting is applied. At the same time, even in one jurisdiction, there may be differences between accounting and taxation of derivatives, and the tax legislation itself may create conditions for tax optimization using derivatives due to inconsistency, uncertainty or asymmetry of tax rules. However, there are theoretically justified situations when the use of derivatives allows company to reduce the amount of taxes paid. From a legal point of view, derivatives are bilaterally binding contracts for the payment of monetary amounts, the price of which depends entirely on the case. The obligation to make a monetary payment arises at least for one of the parties to the contract only in the future, and the amount of payment depends solely on random circumstances and can only be determined at the time of the performance of the obligation itself. In this regard, OTC derivatives are the source of increased legal and credit risk, which can emerge in the form of non-fulfillment the counterparty's obligations under the agreement on futures transaction or in declaring the transaction invalid in a particular jurisdiction.

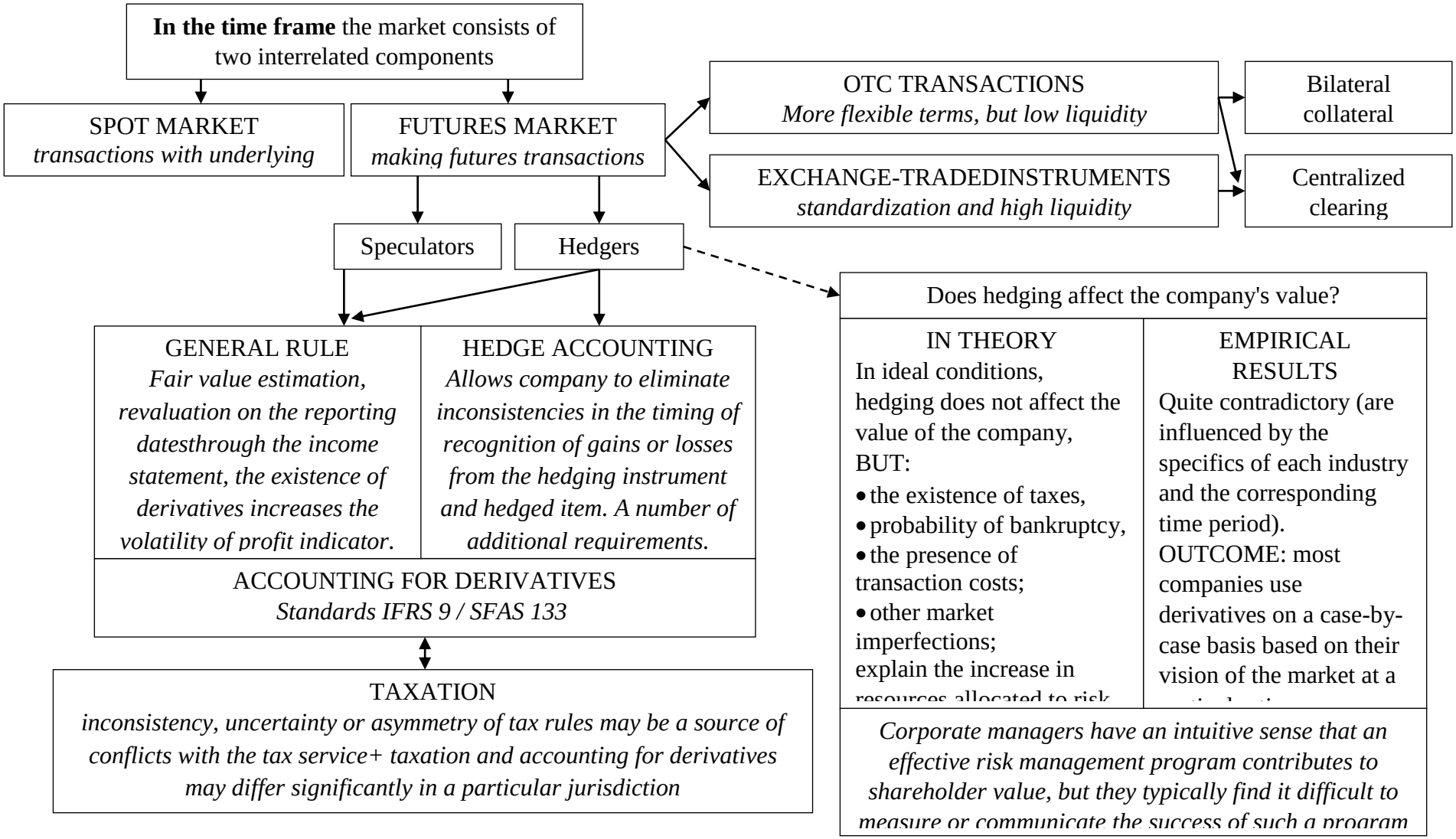

FIGURE 1 – The interdisciplinary approach for determining the essence of derivatives
Source: own development

Conclusion.

The presented interdisciplinary approach for determining the essence of derivatives is primarily theoretical in nature and may serve as a basis for solving problems in the field of derivatives at specific levels: whether it is the level of corporate governance or the level of state regulation. In the context of derivatives management, it can be noted that the understanding of the mechanisms and essence of the derivatives market functioning, due to its complexity, is formed mainly by employees of the financial department who directly perform operations with derivatives market instruments. For management of the company and persons, who are engaged in related fields of activities and not associated directly with the futures market, it may be difficult to understand the essence of conducted operations and related risks, which adversely affects the control of derivatives in organizations, especially non-financial, which are not originally focused on making transactions in the derivatives market as a core activity. That's why the proposed interdisciplinary approach contributes to the organizations of work with derivatives in the company at a higher level.

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