

# Accounting challenges for sustainability and innovations

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Editor



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# 8.

## DERIVATIVES IN ACCOUNTING



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**Abstract:** One type of financial instruments are derivatives whose price depends on the value of the underlying instrument. There are two different approaches to accounting of derivatives: general model—in which derivatives are presented as assets or financial liabilities, measured at fair value and referred to the financial result, and hedge accounting—which requires symmetrical recognition of changes in the value of the hedged item and the hedging instrument. Information on derivatives is presented in the financial statements. The derivative is reflected in the balance sheet of the entity that is a party to a given contract, while the result obtained on the derivative contract is presented in the profit and loss statement.

**Keywords:** derivatives, fair value, financial instruments, financial option, forward, futures, swap, valuation.

## 8.1. Classification of financial instruments

A financial instrument is a contract that gives rise to a financial asset for one party and a financial liability or equity instrument for the other party, provided that the contract between two or more parties clearly gives rise to economic effects, regardless of whether the obligations under the contract is unconditional or conditional.

Figure 8.1 shows the balance sheet effects of the occurrence of a financial instrument.

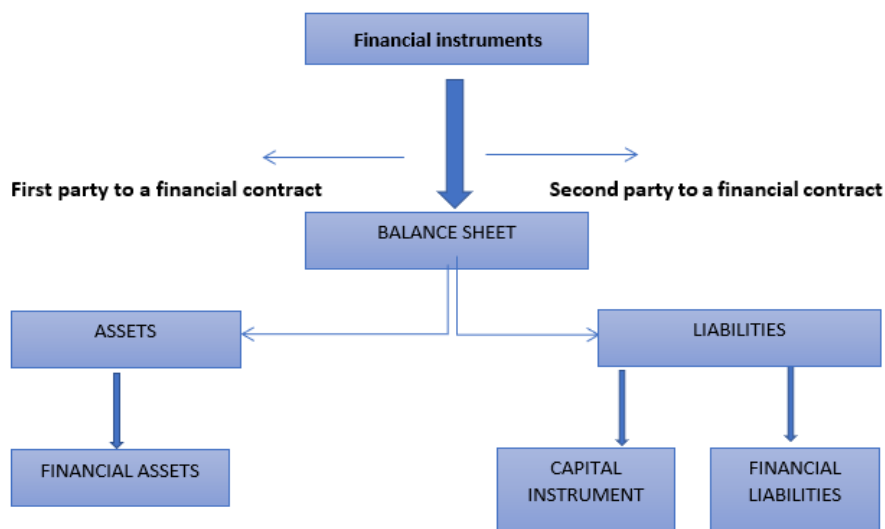


Figure 8.1. The balance sheet effects of the occurrence of a financial instrument

Source: Own study.

The classic division of instruments according to their economic nature includes three groups:

- 1) primary instruments,
- 2) derivatives,
- 3) compound instruments.

Primary financial instruments are financial assets or financial liabilities, which the entity will receive or pay in a fixed or determinable amount. Feature Primary instruments are highly liquid, which means they can be quickly converted for cash. The typical primary instruments include (Masztalerz, 2006):

- cash (e.g. cash on hand and in bank accounts, bills of exchange and checks),
- debt securities acquired or issued (e.g. bonds),
- equity securities acquired or issued (e.g. shares),
- contractual rights to receive or transfer money,

- financial assets (e.g. loans, credits).

Primary instruments may be of a monetary nature (when economic benefits are in the form of cash) or of a non-monetary nature (when the benefits are in the form of assets other than cash).

Financial derivatives are financial instruments, the value of which is derived from the value of the underlying instrument. A financial derivative instrument is considered to be a financial instrument for which the conditions are met:

- the value of the instrument depends on the change in the value of the underlying specific interest rate, price of a security or commodity, rate currency exchange, price or rate index, credit rating or index credit card or other similar amount,
- the acquisition does not incur any initial expenses or value net of these expenses is low compared to the value of other contracts whose price similarly depends on changing market conditions,
- settlement will take place in the future.

It is worth noting that in order for a financial instrument to be considered a derivative, all three conditions must be met simultaneously. For derivatives we include forward transactions (contracts) such as:

- forward contract: an agreement that requires one party to deliver, and the second the obligation to collect assets (e.g. commodities or securities), a specified date in the future and at a specified price at the time conclusion of a contract,
- futures contract: an agreement with specific standard characteristics, being subject to public trading, imposing an obligation on one party delivery, and on the other—the obligation to collect assets of a certain amount, in a specified date in the future and at a specified price at the conclusion of a contract,
- option: a contract that gives an entity the right to purchase assets (call option) or sell assets (put option) at a predetermined rate price within a specified time,
- swap contract: an agreement to swap future payments on terms in advance specified by the parties to the contract.

Compound financial instruments are contracts that consist of an equity instrument and financial or other obligations. Composite instrument can be a combination of:

- 1) two primary instruments (e.g. bonds convertible into shares),
- 2) the primary instrument and derivative (e.g. bonds with built-in early redemption option).

In the second case, we are dealing with the so-called embedded derivative, which has been defined in the Polish balance sheet law as resulting from the concluded contract, terms that cause some or all of the cash flows contract yield changes in a manner similar to what it would cause stand-alone derivative. Common embedded derivatives can include:

- contracts in which the amounts due are indexed, e.g., according to the inflation rate, rates interest rates and/or exchange rates,
- early redemption options for debt securities (bonds).

## 8.2. Types of derivatives

Derivatives are one of the groups of financial instruments.. The word comes from Latin from the word ‘derivatio’, which in free translation means creating one thing on the basis of another, already in circulation (Remlein, 2011, pp. 149–150).

In the case of forward and futures, both parties are obligated to perform the terms of the contract within a specified future date. Final settlement is made at the forward rate, i.e. the price set for a given day in future.

In practice, futures contracts are very often used for hedging receivables or liabilities in foreign currencies. If, for example, a company has 1,000 euros to pay and is afraid of unfavourable changes in the exchange rate, it may purchase a futures contract for 1000 euros. In the case of receivables, hedging against foreign exchange risk will be to sell the contract. Futures and forward contracts, despite their many similarities (in terms of profitability profile of the parties to the contract and obligations under the contract), are significantly different from each other. The most important differences are presented in Table 8.1.

**Table 8.1. Comparison of forward and futures contracts**

Forward	Futures
Private agreement between the parties	Subject of exchange trading
No standardization	Standardization (price, date, conditions)
Single delivery date specified	Date range during which delivery is possible
Settled at the end of the contract validity	Settled daily
Physical delivery is common	Physical delivery is missing
No deposit	No deposit required

Source: (Masztalerz, 2006).

In the case of an option contract, the purchaser of the option has the right to buy or sell a specific instrument, while the writer of the option is required to exercise on demand the buyer’s contractual rights. For the privilege of the right to exercise the option, the buyer pays a premium. Obviously, the buyer will exercise the option only if the current instrument price the underlying will be higher (for a call option) or lower (for a put option) than the price the exercise of options (forward price determined at the moment of concluding the contract).

The premium paid is for the option buyer the maximum loss that he may incur: if the buyer chooses not to exercise the option, he will only lose the premium paid. Potential profit for the option buyer is theoretically unlimited. The situation is a much riskier option for the writer for whom the premium is the maximum yield on the contract, provided that the buyer does not exercise the option.

Swap contracts concern an exchange of obligations between the parties to a contract. Typical transactions in this group include:

- an interest rate swap, which consists of the conversion of interest payments (on liabilities in that the same amount and in the same currency) between the parties to the contract, one of which pays the fixed interest rate and floating rates for other party,
- foreign exchange swap, which involves the exchange of liabilities expressed in different currencies between the parties to the contract (e.g. one party has a loan in CHF and the other the party in PLN and as a result of concluding a swap contract “swap” with payments),
- a commodity swap, which swaps payments based on prices for the agreed quantity of the specified goods. With swap contracts, there is no physical delivery, only financial settlement as the effects of the transaction.

### 8.3. Valuation

The concept and scope of financial instruments have not changed. However, the attitude towards the classification of financial instruments is changing (Barczyk, 2018, p. 8). IFRS 9 is additive classification by two factors (IFRS 9, 2016, par. 4.1):

- 1) the business model that is applicable to the particular business a financial asset,
- 2) characteristics of the contractual cash flows of the given component financial assets.

Taking into account the above-mentioned factors, financial assets are classified after initial recognition at an amortized cost or at fair value through profit or loss or other comprehensive income (IFRS 9, 2016, par. 4.1.1). After initial recognition, financial liabilities are measured at amortized basis cost. There are few exceptions to this rule, such as derivative instruments measured at fair value through profit or loss, financial guarantee contracts or loan commitments with an interest rate below the market interest rate valued according to separate principles (IFRS 9, 2016, par. 4.2.1).

Financial assets measured at fair value can be divided into two subcategories (Barczyk, 2018, p. 8-9):

- 1) financial assets at fair value through profit or loss,
- 2) financial assets measured at fair value through other comprehensive income.

In the case of the first sub-category, gains and losses on financial assets at fair value will be recognized in the result for the current period, and for the second sub-category of financial assets, valuation gains and losses will be recognized in other comprehensive income.

The initial recognition of derivative instruments depends on the manner of concluding the transaction. It is measured differently and recognized in the books

of account as at the acquisition date and as at the balance sheet date. A different treatment applies to transactions for which:

- there are no cash flows at the inception,
- concluding the transaction requires the payment of a deposit,
- concluding a transaction requires payment (or receipt) of the so-called bonus.

In the case of a forward contract, there are no initial cash flows from the contract when the contract is concluded. The fair value at this point is nil. This results in a lack of recognition in the balance sheet as at the date of contact. Such a transaction is initially recorded in off-balance sheet records. Only at the time of balance sheet valuation is the forward contract recognized in the financial statements. The positive fair value of the forward contract is recognized as a financial asset. The negative fair value of the contract is recognized in financial liabilities.

Characteristics of futures contracts are similar to those of forward contracts. Contrary to forward contracts, they require a deposit. The initial deposit paid cannot be equated with the initial investment, i.e. with the expenditure to purchase a derivative. The cash deposited reduces the cash balance of the entity's balance sheet, while the deposit should be accounted for as a deposit receivable from the exchange clearing house where the transaction was made. The fair value of the futures contract on initial recognition in the accounting records is zero. Example 8.1 shows the initial valuation of a futures contract.

Company X concluded a futures contract on a regulated exchange for the sale of 100 tons of wheat at a price of EUR 500 / t. We assume that the terms of such transaction require a 6% deposit.

Contract nominal value: 50 000 EUR (100 t x 500 EUR/t)

Deposit value: 3000 EUR (6% x 50 000 EUR)

ASSETS		LIABILITIES	
Receivables from deposit	↑ 3000		
Cash	↓ 3000		

**Example 8.1. Initial valuation of a futures contract**

Source: Own work.

Financial options are the only derivative instruments that require an initial outlay to conclude. When an entity purchases an option, it must pay the writer

a specified amount of cash that will reflect the original value of the option. When an entity sells an option, the amount of the premium received determines the initial value of the option to be recognized as a financial liability. Examples 8.2 and 8.3 show the initial valuation of a put option and call option.

Company X buys a put option entitling it to sell for six months of the sale EUR 100,000 at the rate of PLN / EUR 4.3. The option price was set at 1,000 basis points. The price for 1 basis point is PLN 10

Bonus value: PLN 10,000 (1,000 basis points x PLN 10)

ASSETS		LIABILITIES	
Financial assets - options	↑ 10 000		
Cash	↓ 10 000		

#### Example 8.2. Initial valuation of a put option

Source: Own work.

Company X issues a put option, committing itself to buy EUR 100,000 for six months at the rate of PLN 4.3 / EUR. The option premium is PLN 10,000.

ASSETS		LIABILITIES	
Cash	↑ 10 000	Financial liability - options	↓ 10 000

#### Example 8.3. Initial valuation of a call option

Source: Own work.

In business practice, linked transaction to financial options are often concluded. In this situation, one entity issues the other a put option and the other a call option. Example 8.4 shows the valuation and initial recognition of a linked transaction.



Company X bought an option from the bank, the price of which is EUR 10,000. At the same time, the company sold an option to this bank, the price of which is EUR 9,500. In such a situation, the physical cash flow was EUR 500, which was paid by company X. The fair value of the bought and sold options are their prices (option premiums).

ASSETS		LIABILITIES	
Financial assets - options	↑ 10 000	Financial liability - options	↑ 9 500
Cash	↓ 500		

#### Example 8.4. Initial valuation of a linked transaction

Source: Own work.

As at the balance sheet date, derivative instruments are measured at fair value. The recognition of the effects of the measurement depends on the purpose of the transaction that resulted in the creation of the derivative. Due to the purpose of the transaction, the following are distinguished:

- derivative instruments concluded for commercial purposes (non-hedging, speculative),
- derivatives contracted for hedging purposes.

Derivatives concluded for hedging purposes as at the balance sheet date are measured not later than at the end of the reporting period, at a reliably determined fair value without reducing it by transaction costs that the entity would incur by selling these assets or by derecognition of them from the books of account for other reasons, unless the amount of these costs would be significant. In addition, for derivatives, additional documentation is required in the form of:

- defining the goal and risk management strategy,
- identification of both the hedging instrument and the hedged item,
- characteristics of the risk associated with the hedged item,
- the duration of the security,
- a description of the selected method of assessing the effectiveness of the hedge of changes in the fair value or cash flows of the hedged item related to a given type of risk.

The condition for applying hedge accounting is assessing the effectiveness of the hedge, both *ex ante* and *ex post*. Hedge effectiveness is the degree to which the loss on the hedged item is covered by the profit (loss) earned on the hedging

instrument. Hedge effectiveness is measured both *ex ante* and *ex post*. An effective hedging is in the range of 80%–125%.

Derivative instruments concluded for trading purposes are recognized as assets held for trading. As at the balance sheet date, they are measured at fair value. The effects of the measurement are recognized in the financial result of the entity as:

- financial income: increase in fair value,
- finance costs: decline in fair value.

Example 8.5 shows the valuation of a forward contract at the balance sheet date when the fair value of the contract increases. Conversely, Example 8.6 shows the effect of a decline in fair value.

Company X has entered into a forward contract. As at the balance sheet valuation date, the contract's fair value is positive and amounts to EUR 1,000.

ASSETS		LIABILITIES	
Financial assets - <i>forward</i>	↑ 1 000	Financial result	↑ 1 000

**Example 8.5. Balance sheet valuation of forward contract—increase in fair value**

Source: Own work.

Company X has entered into a forward contract. As at the balance sheet valuation date, the contract's fair value is negative and amounts to EUR 600.

ASSETS	LIABILITIES	
	Financial result	↓ 600
	Financial liability	↑ 600

**Example 8.6. Balance sheet valuation of forward contract—declining fair value**

Source: Own work.

Examples 8.7 and 8.8 show the balance sheet valuation of a futures contract. Example 8.7 shows the effects of the futures contract valuation resulting in an

increase in the fair value. Example 8.8 shows the effects of a decline in the fair value of a futures contract.

Company X entered into a futures contract on the exchange that required a deposit of EUR 5,000. The current balance of the deposit is EUR 7,000. In the period from the conclusion of the contract to the valuation date, company X did not have to replenish the deposit.

Fair value of the futures contract at the measurement date: EUR 2,000.

ASSETS		LIABILITIES	
Financial assets - futures	↑ 2 000	Financial result	↑ 2 000

#### Example 8.7. Balance sheet valuation of futures contract—increase in fair value

Source: Own work.

Company X entered into a futures contract on the exchange that required a deposit of EUR 5,000. Initially, the contract was losing value, so the company had to top up the deposit by making a deposit of EUR 3,000. The current deposit balance is EUR 5,000.

Fair value of the futures contract at the measurement date: - EUR 3000.

ASSETS	LIABILITIES	
	Financial result	↓ 3000
	Financial liability - futures	↑ 3000

#### Example 8.8. Balance sheet valuation of futures contract—declining fair value

Source: Own work.

Swap contracts are a special case of derivatives. At the time of their valuation, there are usually cash flows from the partial settlement of the transaction. All effects arising from this situation should be reflected in the balance sheet. An example of swap contract settlement as at the balance sheet date is presented in example 8.9.

Company X has entered into a swap. As of the date of the initial valuation after its inception, positive cash flows of EUR 1,000 are realized. The fair value of the remainder of the swap is EUR 8,000.

ASSETS		LIABILITIES	
Financial assets - swap	↑ 8 000	Financial result	↑ 9 000
Cash	↑ 1 000		

**Example 8.9. Balance sheet valuation of swap**

Source: Own work.

Both the initial and balance sheet valuation of derivative instruments depends on the type of derivative and its purpose. The valuation of derivative instruments as at the purchase date in the case of forward contracts is not recognized in the financial statements at all. In turn, the initial valuation of futures contracts includes the value of the deposit made. In the case of an option, the initial value of the option is the paid-in option premium.

As at the balance sheet date, all derivative instruments are measured at fair value. When derivative instruments are acquired for commercial purposes, the effects of changes in fair value are recognized in the entity's financial result. Increasing the fair value of a derivative increases financial income, while decreasing the fair value causes financial costs. If the derivative was purchased to hedge against financial risk, then additional documentation of the hedge effectiveness is required.

## 8.4. Presentation of derivatives

Financial instruments can protect the fair value of certain company's assets or their cash flow. They can be useful for companies which sell to foreign receivers and are paid in foreign currency but have expenditures in domestic currency. They need to protect themselves against unfavorable currency fluctuations.

One type of financial instruments are derivatives. The feature that distinguishes a derivative from other financial instruments is the volatility of the price which depends on the value of the underlying instrument.

The complexity of derivatives and standards concerning generally financial instruments may cause that these operations are complicated to measure and disclose (Malaquias & Zambra, 2019).

In Poland, accounting for derivative instruments is regulated by the following acts:

- the Act of September 29, 1994 on accounting,
- the Ordinance of the Minister of Finance of December 12, 2001 on specific matters principles of recognition of valuation methods, scope of disclosure and method of presentation financial instruments,
- International Financial Reporting Standards adopted for application in the European Union, for entities applying IFRS for purposes of financial reporting and in matters not regulated by national regulations.

Regulatory issues related to accounting for derivatives were included in International Accounting Standards (IAS) and International Financial Reporting standards (IFRS).

International Accounting Standard 39 (IAS 39) has been replaced by the International Standard Financial Reporting 9 (IFRS 9) which entered into force on January 1, 2018. IFRS 9 should be used by companies listed on regulated markets in the European Economic Area. The aim of this Standard is to “establish principles for the financial reporting of financial assets and financial liabilities that will present relevant and useful information to users of financial statements for their assessment of the amounts, timing and uncertainty of an entity’s future cash flows” (IFRS 9, 2016).

People who use financial information provided by entities in reports created in accounting system to make decisions need, among others, data about the usage of financial instruments, including derivatives. Information on derivatives can be found in the financial statements. However, it is necessary to know where to look for and understand what the information disclosed and presented by the entity means.

There are two different approaches to accounting of derivatives:

- general model—in which derivatives are presented as assets or financial liabilities measured at fair value and referred to the financial result,
- hedge accounting—requires symmetrical recognition of changes in the value of the hedged item and the hedging instrument.

From a company’s point of view hedge accounting is preferred because it allows to get a reduction in volatility of earnings. In the case of hedge accounting, gains or losses on a particular used instrument are recognized in the profit and loss statement together with losses and gains on the item being hedged.

There are three variants of hedge accounting. In the first, the fair value of the derivative is set on the balance sheet as an asset or a liability, while gains and losses are presented in the income statement immediately. In the second, the fair value of the derivative is set on the balance sheet as an asset or a liability. Gains and losses are presented as solo item on the balance sheet, an adjustment to the reserves and the disclosure in the statement of total recognized gains and losses take place. In the third variant the derivative is an off-balance sheet item until time

of the establishment of a position. Hedge accounting complies with the matching concept (Dunne, Helliari, & Power, 2003, p. 23).

In the case of hedging against currency risk, the hedging instrument may be a derivative, whose fair value or cash flows resulting because of this is expected to be offset by the changes of the fair value or cash flows of the hedged item (Ring, 1997).

The entity has the right, but not the obligation, to apply hedge accounting for derivatives that are used for hedging purposes. In order to be able to apply these different accounting principles, the requirements of IFRS 9 must be met.

In case of a failure to meet the conditions or with respect to derivatives used for purposes other than hedging, the entity is required to apply the general rules. In such a case, such instruments should be classified in financial assets or liabilities measured at fair value and the effects of this valuation should be referred to the financial result. There is a need to measure the instruments at fair value at each balance sheet date. Effects of value changes are shown in the profit and loss statement.

Both derivative accounting models do not allow to show in the statement of financial position specific hedged items at the value resulting from the posted (e.g. inventory values). During the period of the relationship, the carrying amount of the hedged asset or liability is adjusted for changes in fair value caused by the materialization of the hedged risk. However, the fair value of the hedging instrument is presented separately as financial assets or liabilities (Andrzejewski, Dunal, & Ożga, 2018, p. 196).

The aim of hedge accounting is to present in the financial statements the effect of the usage of financial instruments to risk management activities which can have an effect on profit or loss (PWC, 2016). In other words, hedge accounting is a technique in which associated hedging instruments and hedged items are recognized in profit and loss statements in the same period.

In IFRS 9 there are three hedge accounting models:

- fair value hedge (a change in the fair value of an asset or liability is hedged),
- cash flow hedge (the exposure to variability in cash flows is hedged),
- net investment hedge (the currency risk concerning the translation of the net assets of foreign operations can be hedged).

In hedge accounting there are required among others disclosures concerning (PWC, 2016):

- the risk management strategy and its application,
- the possible impact of hedging activities on cash flows,
- the effect of hedge accounting on an entity's financial statements.

The requirements for these areas are detailed so entities should make an effort to meet all of these. Hedge accounting is an exception of some kind in accounting system. Its use is a privilege, not duty. The possibility of using it requires meeting specific conditions (Żebruń, 2010). An entity may apply hedge accounting to a specific group of derivatives and the general model relative to the rest at the same time.

In Polish law, general conditions for the application of hedge accounting were indicated in the Accounting Act of September 29, 1994. In this legal act, the financial instruments for security purposes were posted.

Due to the voluntary application of hedge accounting, hedging instruments may be presented in the financial statements in the same way as speculative instruments, that is, according to the general model. Selective application of the hedge accounting model may therefore lead to profit management (Ryan et al., 2002).

The derivative is reflected in the balance sheet of the entity that is party to a given contract. The balance sheet is a great source of information on the use of derivatives. Information on derivatives is important both for external and internal users of accounting information.

Balance sheet law imposes certain disclosures and ways of presenting derivatives in their financial statements to provide stakeholders with information about the instruments that companies use.

For derivatives, on the side of assets there are reflected the effects of the right to exchange financial instruments with another enterprise on terms that are potentially favourable to it. However, on the liabilities side, the entity's contractual obligations are recorded to this exchange when its conditions are unfavourable at the moment (Krzywda, 2005).

Pursuant to the Polish balance sheet law, entities are recommended to describe in the notes to the financial statements the basic data on the instruments used, including derivatives. These disclosures are intended to help stakeholders understand the relevance of the instruments used to the entity's situation and performance (Kotyła & Bucior, 2008, p. 83).

The presentation of derivatives may be presented on the example of one of the most frequently used instruments, which is forward.

Buying a forward causes on the date of conclusion the contract an increase in financial assets and financial liabilities by the contract value. On the balance sheet date the forward contract is measured at fair value. Then, the value of financial assets or liabilities is increased or decreased by the result on the hedging instrument. If the price of the underlying instrument shapes such that it will occur the profit on the hedging instrument, that is, the fair value of the contract will be positive, the financial assets will be increased by its value. However, if it is the loss (when the fair value of the contract is negative) it will increase the liabilities (Gawrońska, 2018).

The forward contract is measured at the balance sheet date at fair value. In most cases, the fair value information is obtained by entities from the bank with which they concluded the contract. The effects of the revaluation of the forward value are recognized as financial revenues or costs in the period, in which the valuation was made. Effects of valuation of forward currency contracts do not constitute exchange rate differences (Gofin, 2011).

In the financial statements prepared in accordance with the Polish balance sheet law, the increase in the value of forward contracts is shown in the profit and loss statement on the side of financial revenues “Revaluation of investments”. However, the decrease in value is shown on the side of financial costs in the item “Revaluation of investment”. In case of a negative fair value, the contract is recognized in the liabilities of the balance sheet under the item “Short-term liabilities towards related entities - other” “Liabilities short-term to other entities—other financial liabilities. If the fair value of contract is positive, such contract is recognized in the balance sheet as assets under position “Short-term investments—other short-term financial assets” (Gofin, 2011).

Derivative contract balance sheet valuation does not result in cash flows. Therefore, no cash flow from financing activities is shown in the cash flow statement. The corresponding adjustment should be included in the net profit adjustments (Gofin, 2019). Pursuant to Polish regulations, this adjustment is made in the item “Profit (loss) on investment activities” or in the item “Other adjustments” in the cash flow statement prepared using the indirect method.

## Questions / tasks

1. Please list the types of derivatives.
2. How are derivatives valued at the date of acquisition?
3. How are derivatives valued at the balance sheet date?
4. Does the designation of a derivative affect its valuation?
5. Point and describe two different approaches to accounting of derivatives.
6. Explain in which reports stakeholders can find information about the derivatives used by companies.
7. Explain the presentation of the forward in financial statements.

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