

Analysis of the increase in prices of construction commodities and compensatory measures

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Abstract: The current market is unstable in terms of prices, it is significant not only in the construction sector. Sharp fluctuations in the price of construction commodities caused significant complications in construction. They had to start looking for a solution for such cases. Gradually, methodological guidelines began to emerge to help determine the value of compensation for these unpredictable phenomena. Individual methodologies, for new buildings or ongoing ones, have targeted help in some components of the calculation formula. The article provides an overview of compensatory measures, the goals of their compensation, with validity, with an estimate of impacts, and an overall evaluation. The post highlights a selection of some supporting elements that were recorded with a price at a time when price fluctuations are evident.

Keywords: calculation formula; methodology, construction sector

Abstrakt: Súčasný trh je nestabilný z pohľadu cien je značný nielen v stavebnom sektore. Prudké výkyvy nárastu cien stavebných komodít spôsobili značné komplikácie vo výstavbe. Museli sa začať hľadať riešenie pre takéto prípady. Postupne začali vznikať metodické usmernenia, ktoré majú napomôcť pri určovaní hodnoty kompenzácie týchto nepredvídateľných javov. Jednotlivé metodiky či už na nové stavby alebo prebiehajúce majú cieľnú pomoc v niektorých zložkách kalkulačného vzorca. Článok prináša prehľad kompenzačných opatrení, ciele ich kompenzácie, s platnosťami, s odhadom dopadov a celkové zhodnotenie. V príspevku je vyznačený výber niektorých nosných prvkov, ktoré boli zaznamenaná s cenou v čase, kde je zřejmý výkyv cien.

1. Introduction

Standard inflation adjusts the prices of building materials every year, either upward or downward. Their value or direction is unpredictable and depends on several factors. At the same time, their significant fluctuation has an impact on the price of the construction, the contractor's calculation, the investor's investments, etc. Depending on the material and its quantity on the construction site, this can have a significant impact on the price. For example, an increase in the price of steel does not have a big impact on a ground structure, where there is a small representation of reinforcement in the entire volume of the structure, but in the case of an entire bridge made of steel, it can have a huge impact on the price of the structure.

Inflation, an increase in the prices of materials and labour, consumer goods or fuel, lack of raw materials on the market, or other factors affect the calculation components not only of contractors, but also of subcontractors, material producers, transporters, etc.

In the course of 2021, due to the influence of certain events also mentioned in the ÚVO and MINDOP methodologies, the first increase in the prices of construction materials and works occurred. Based on published data from the Slovak Republic Statistics Office, it is possible to observe the growing development of the value of the price index of construction materials. In addition to the ŠÚSR, CENEKON (the creator of the commercial database) also presents the increase in the prices of construction works and materials, as well as ODIS, KALKULUS, etc., which incorporate the prices of construction materials, labor, and other inputs into their prices in order to calculate the current representative market value of the items (work and materials). When signing the contract, each supplier (contractor) is in a position of a professional guarantee of the delivery of the work on time and at the agreed price [1-3]. The agreed price is based on internal experience of constructions carried out in the past, own calculation, contracted subcontractors and a certain prediction of the continuing standard predictable increase in commodity prices on the market, the so-called price development index maintained by the ŠÚSR, further on the ÚSZ, or SKOHEMAZ. This can be considered in the risk (profit part) of the contractor as a certain prediction - an expected acceptable fact, incorporated into the price of the work. Experience from realisations helps him to calculate the price of the work with a certain estimated value. On the basis of internal surveys and questionnaires, contractors determine it retrospectively for the last 3 years.

Based on the Slovak Republic data of the Statistical Office, which forms the indexes of construction works, materials, and products consumed in the construction industry, it is possible to state the overall increase in prices in the monitored period from 2015 to the present. The prices of the selected representatives are determined including all materials, complete construction costs (object), and profit. Prices are shown without VAT. In the DATACUBE section, there are also indexes for buildings according to the statistical classification of buildings.

It is necessary to distinguish between a predictable change (increase or decrease), which has a basis in previous data on the development of prices, and an unpredictable fluctuation, which has various origins (COVID, conflict in Ukraine, lack of raw materials or labour, increasing energy prices, etc.), i.e., inputs that cannot be predicted when calculating the price.

To show the unpredictable increase in the price of the material on the market in Slovakia, Figure 1 shows several supporting materials in the construction industry [4-6].

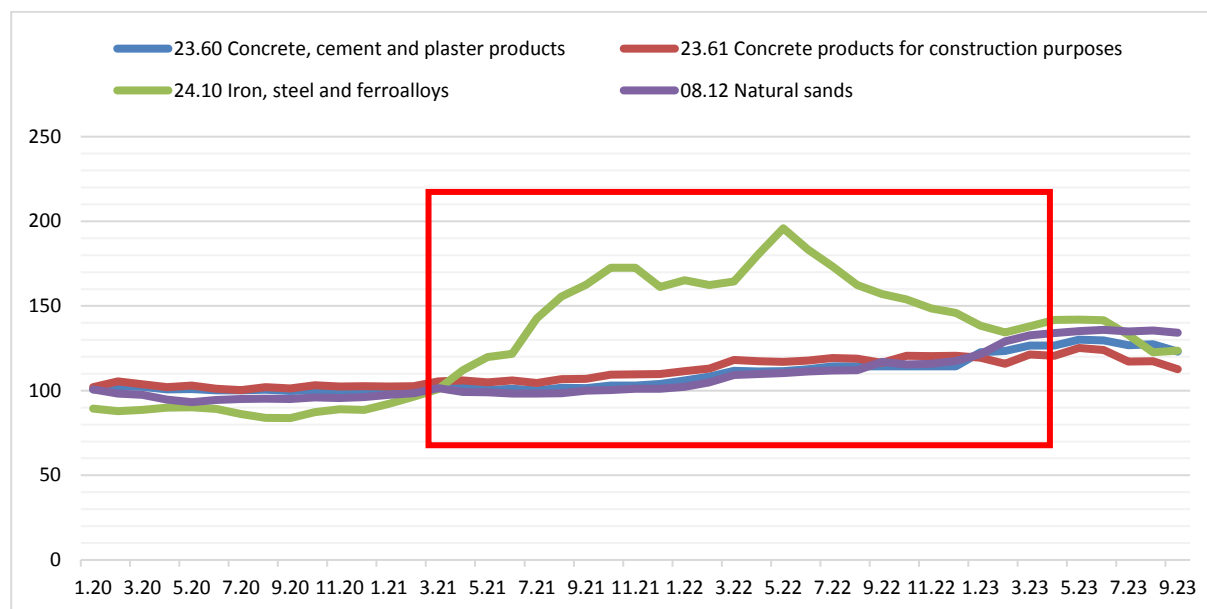


Figure 1. Development of indices of production prices of selected building materials, where the unpredictability of fluctuations is represented by the green area [7]

2. Value and price

The value is (in the sense of the general value of real estate): the resulting objectified value of real estate and buildings, which is an expert estimate of their most likely price on the valuation date, which they should achieve on the market under conditions of free competition, in a fair sale, when both buyers and sellers will act with appropriate information and caution and with the assumption that the price is not influenced by an unreasonable motive.

According to EP Regulation no. 575/2013 market value is the estimated amount for which the property could be exchanged on the valuation date between a willing buyer and a willing seller in a transaction based on an arm's length relationship after proper marketing, with each party acting properly informed, prudent and without coercion".

Price (definition, its creation and content) according to the law on prices:

- § 2 Basic terms; is the monetary amount agreed upon when buying and selling goods. The tariff is also considered a price according to this law. The difference between the price of purchased domestic or imported goods, which are resold in an unchanged state, and the price for which they are sold is considered the price of business or intermediary performance, even if it is not explicitly and separately agreed upon. Economically justified costs mean the costs of procuring the corresponding amount of direct material, wages, and other personnel costs and, in the case of a valid wage regulation system, only those that correspond to this system, technologically necessary other direct and indirect costs and costs of circulation; the assessment of economically justified costs is based on the development of the usual level of these costs in comparable economic conditions, taking into account the particularities of the given goods. Reasonable profit means the profit based on the development of the usual share of profit of domestic goods on economically justified costs, taking into account the quality of the goods, the usual risk of production or circulation and the development of demand on the domestic market.

- § 3 Negotiating the price; A price agreement is an agreement as to the amount of the price or an agreement as to the manner in which the price will be established, provided that the manner sufficiently determines the price. The price agreement will also be established by the buyer paying the price of the goods in the amount requested by the seller. When negotiating the price, the binding definition of the goods is the name, possibly also the numerical code of the customs tariff or the numerical code according to a special regulation, the unit of quantity, quality, and delivery conditions, or other conditions agreed upon by agreement of the parties (hereinafter referred to as "agreed conditions"). Part of the price of the goods defined by the agreed conditions may be fully or partially the costs of procurement, processing, circulation of the goods and profit. Unless otherwise agreed or established by a special regulation, the price also includes the value added tax, the relevant consumption tax, and, in the case of imported goods, customs duties, and other payments collected as part of the application of non-tariff measures established by special regulations [8].

3. Development of proposed solutions by competent institutions

The development of proposed solutions came at the end of the first half of 2022 from the Ministry of Transport for future public contracts and those that are ongoing. At the same time, the Public Procurement Office also published its analysis - see fig. 2 further. Blue arrows are valid legislative methodologies, statements, and green arrows are the validity of other legislation (methodology).

Statements of the institutions concerned in chronological order:

- ÚVO General methodological guidelines General methodological guidelines of the Office for Public Procurement on the application of § 18 par. 1 letter c) Act no. 343/2015 Coll. on public procurement and amendments to certain laws.
- Methodological instruction of the Ministry of Transport and Construction of the Slovak Republic no. 19/2022, which establishes the price adjustment mechanism as a result of cost changes in projects of repair and maintenance, construction, modernisation and reconstruction of engineering structures and buildings (for future contracts) (effective from 8 June 2022).
- Methodological instruction of the Ministry of Transport and Construction of the Slovak Republic no. 22/2022, which establishes the price adjustment mechanism as a result of cost changes in repair and maintenance projects, in the construction, modernisation and

The basic prerequisite for the application of the indexing mechanism is that the construction contractor adheres to the contractually established and agreed construction schedule, including construction deadlines. For the application of the indexation mechanism, the decisive period is the quarter, while:

- a) The reference period (marked as the period " t_0 ") is the quarter that includes the calendar day on which the deadline for submitting bids for construction tenders expired;

Indexation based on the guidelines of the Ministry of Transport provides for the proportional distribution of construction costs, based on 4 groups, in the ratio of 10% / 20% / 8% / 62%. The first 10% represents the part of costs that are not subject to indexation. In the 20% part of the indexation method, it compares the differences of the indices of harmonised consumer prices, which according to the guidelines should compensate for labour costs. The third part of the formula (8%) represents the change in the price of fuel - diesel. The largest share is expressed in the last part, which is 62%, representing the change in the production prices of construction materials, recorded on the basis of the price index of construction materials and products consumed in the construction industry [10].

4.2 Methodological instruction 27/2022 valid from 23.9.2022 to 16.08.2023, for existing buildings

Methodological instruction no. 27/2022, which establishes the price adjustment mechanism as a result of cost changes in repair and maintenance projects, in the construction, modernisation and reconstruction of engineering structures and buildings - amendment of the contract, framework agreement, and concession contract during its duration.

$$P_m = \left(\frac{\text{Material } m_t}{\text{Material } m_{t_0}} \right) - TR \text{ average } m_{t \text{ risk}} \quad (2)$$

$$\text{Elevation } P_m = [(P_m * JC_m) - JC_m] * \text{quantity}_m \quad (3)$$

Elevation P = sum of increased values for increased materials

Article 2:

(1) Methodical instruction and price adjustment mechanism are required by public contracting authorities and contracting authorities (hereinafter referred to as "the contracting authority") to calculate the value of the contract addendum (increase and claims) as a result of unforeseeable changes in costs for building materials (hereinafter referred to as the "increase calculation mechanism") for all procured buildings in accordance with Article 1, par. 1.

(2) For the application of the price adjustment mechanism, the decisive period is the quarter, while:

- a) the reference quarter (marked as the " t_0 " quarter) is the quarter in which the calendar day falls, on which the deadline for submitting bids for the construction construction tender has expired;
- b) the decisive quarter (marked as quarter " t ") is the quarter in which construction was carried out and for which the construction contractor applies the price adjustment mechanism;
- c) the period for calculating the expected risk (marked as " t_{risk} ") based on the development of the price of a particular selected building material (" m ") is the period of 5 years preceding the reference quarter " t_0 ".

(3) Values expressed in EUR per unit of measurement (unit prices) of selected building materials (marked as " m ") are recommended to be determined for the reference period in the following ways:

- a) Unit prices of selected building materials (marked as "m") for the reference period can be established (determined, assessed) based on an expert opinion. The expert opinion will contain the unit prices for the individual materials ("m") for the quarter "to" and thus establish the base on which the increases between the quarters "to" and "t" will be calculated. The expert opinion is prepared by the public contracting authority, contracting authority, or contractor.
- b) Unit prices for selected construction materials ("m") can be calculated or determined from the project documentation, from the tender submitted in public procurement (item analysis or calculation formula) or from documents (for example, measurement report, documentation on implementation of the construction, including its changes and modifications) specified in the contract.
- c) Unit prices of selected building materials ("m") within the set CPA codes, in the case of available relevant data, it is permissible to determine from the submitted invoices for individual materials defined by the essential delivery and quality conditions of the price validity. It is fundamentally necessary to incorporate these materials on the construction site according to the valid DRS. Only the specific invoice of the supplier of the material to the contractor will be used, which is closest in time to the date of the end of the tender submission period for the construction of the construction in question, and which contains the unit price for the material. The specified unit price is re-indexed back (converted) to the period "to" using indexes. The unit price of the given material ("m") at time "to" is calculated as the share of the value of the index of the given material ("m") in the quarter corresponding to the day of the invoice and the value of the index of the given material ("m") at time "t0" and the result of this calculation is subsequently used to divide the unit price of the given material ("m") stated in the invoice [11].

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1. Methodological instruction no. 27/2022, which establishes the price adjustment mechanism as a result of cost changes in repair and maintenance projects, in the construction, modernization and reconstruction of engineering structures and buildings, changes to the contract, framework agreement and concession contract during its duration with an effective date of 23.9.2022 (d' but only "methodical instruction No. 27/2022")

2. Methodological instruction of the Ministry of Transport of the Slovak Republic no. 1/2023, which establishes the price adjustment mechanism as a result of cost changes in the projects of modernization and new production of railway vehicles - amendment of the contract, framework agreement and concession contract during its duration with an effective date of 8 February 2023 (hereinafter referred to as "methodical instruction" 1/2023")

3. Methodological instruction of the Ministry of Transport of the Slovak Republic no. 6/2023, which establishes the price adjustment mechanism as a result of cost changes in rail vehicle repair and maintenance projects - change to the contract, framework agreement and concession contract during its duration with an effective date of 28.3.2023 (hereinafter referred to as "methodical instruction No. 6/ 2023").

Figure 3. Excerpt from the document: Minister's decision on the cancellation of methodological instruction 27/2022 [12, 13]

Regarding this issue, a request was sent to the Ministry of Justice for an opinion on which sector this assignment can be assigned; see Figure 3.

5. Production and purchase price

5.1 Production prices of selected materials used in construction according to CPA breakdown: index December 2005=100 [sp1823ms]

For analytical purposes, the price indices of materials and products consumed in the construction industry (production prices) are also calculated. The price indices of domestic producers of selected construction materials taken from the statistics of prices of industrial producers are inserted into the calculation. The selected 89 groups of KP were assigned weights equal to the relative share of the representative's value volume in the total value volume of construction materials consumed in the respective direction of construction and the total construction production in 2015.

5.2 Indices of purchase prices of selected construction materials according to the CPA 2015 - quarterly classification [sp1808qs]

The price indices of the materials and products consumed in the construction industry contain 95 groups of materials and products classified according to the production classification (KP). The representative indices are taken from the monthly price indices of industrial producers. The weights to calculate the index were derived from the relative share of the volume of value of the representative in the volume of total value of construction materials consumed in construction production in 2015. The basis for calculating the index is the average of 2015. In addition to the indices of production prices of materials and products consumed in the construction industry, quarterly indices of purchase prices (prices at which construction organisations buy materials) are calculated. The scheme contains 197 groups of materials classified according to the Production Classification (KP). The calculation principle is similar to the indices processed from the production prices of materials. The basis for calculating the index is the average of 2015. Finding method: Selected building contractors provide representative prices excluding value-added tax. The scheme of the price index of construction works is compiled from representatives of selected items of construction materials from the CPA Classification 2015. The price of construction works per unit of measure includes all the costs necessary to build a construction object, that is, material, semi-finished products, labour costs, costs of operating construction machinery, transport costs, share of ancillary costs (except construction site equipment) and profit [14].

5. Conclusions

The current market situation is slowly stabilising. The recent period has been difficult in terms of price increases, which was also caused by high inflation. Based on the author's indicative calculations, the compensation according to methodology no. 19/2022, compared to methodology no. 27/2022 two to two and a half times the value. Compared to the price development index in the construction industry, it is in some cases up to three and a half times higher. For compensation using methodologies, it is important to distinguish what they compensate according to the calculation formula. This is also one of the reasons for such differences. Currently, there is no methodology in place to compensate for the sharp increase in the prices of building materials for construction in progress. All actions started before the effective date of this decision, after written confirmation of delivery of complete documentation from the investor (public contracting authority or contracting authority), will be completed according to the then valid and effective methodological instructions no. 27/2022, 1/2023, and 6/2023. For new buildings, compensation is governed by the still valid methodological instruction no. 19/2022, which precisely determines the method of compensation.

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