

Bank Guarantees of Construction Projects, their Concept in Management Accounting and Role in Regional Development

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Abstract. On a regional scale, the intensity of construction projects is an advantage, acts as a multiplier and increases the economic potential of the region. It is a fact that construction projects are a great financial burden for investors and are associated with significant risks that can influence the regional development. These risks arise from both the project itself and from a large number of stakeholders with. Some measures of risk can be eliminated. One such risk is to ensure the keeping the contractual liabilities. For this reason, various forms of bank guarantees are used, but they increase contractor costs and project price. Regional decision is how much the contract is necessary for the positive development of the region and ensuring positive economic cash flows. Meet deadlines and flexible reactions to the current situation is in the company supported with maintaining financial frameworks at several banking institutions. The price depends on many factors including size of the company and financial situation. Then financial costs related to construction have not only variable character, but are also fixed. Market uncertainty, the changing status of labour supply on the one hand and maintaining financial frameworks, capacity and long-term contractual obligations on the other hand, requires a flexible response with respect to cost control. The aim of the paper is to analyse the current situation, define key factors for the pricing of bank products and their impact on the construction price. Methods of pricing, costing, accounting will be used for suggestion of a suitable model for true display and management of financial costs with regard to the construction specifics. These outputs will serve as a basis for finding questionable areas in this area and will be a subject to further investigation.

1. Introduction

The construction industry is usually a major part of a country's economy. Long-term monitoring clearly shows that the construction industry and especially the investment construction activities contribute to the performance of the state by a relatively high percentage. [1] Performance of economy is characterized by a GDP indicator which assesses the economic level of the given state. However, there are differences in the GDP per capita between states which may be either linked to the economic structure, transport accessibility of the region, qualifications of the workforce as well as the extent of construction activities [2]. All these factors must be represented equally. If one indicator reaches above-average values, it will not only affect the overall GDP per capita indicator level, but it will reduce its reporting power at the same time. Dependence between reached GDP and factors influencing it is not one-sided, but double-sided. The economic structure conditions the GDP level, but on the other hand, GDP growth raises the demand for certain activities and thus further changes in the economic structure. As an example, it is possible to show that the range of construction activities can increase with the GDP growth. [3] Moreover, the importance of the GDP indicator is enhanced by the



fact that it serves as an indicator for assessing entitlements to financial support within the framework of the European Union's structural policy. [4]

The industry is also a major contributor to economic performance and employment. It is closely associated with the local environment and includes a broad spectrum of activities, the final result of which is a construction project. As part of the sustainable region development, there is a need to evaluate the extent of the region's infrastructure availability in relation to the supply of labor. The economic success of a completed construction contract demands careful preparations, in particular with respect to pricing. A construction contract is also characteristic for a long and unique production cycle in which a whole host of trades are involved at various intensities and in which capacities are engaged depending on the specific phase of the contract and the selected technological process. The demands placed by construction projects on the trades often exceed the scope of focus and capacities possessed by the project's general contractor. Construction itself is often resolved using subcontractors. Logically, investors try and mitigate the risks associated with the fulfilment of contractual liabilities and various types of financial products are commonly used for such purposes, including bank guarantees, warranty insurance, factoring, letters of credit, forfaiting, amounts retained from prices and of course the institutions of invoicing and payment after delivery of services. According to Arping [5] it is frequently argued that guarantee premia should be "fair", i.e., be based on market prices and not involve net subsidies to the banking sector.

Construction contracts are put out for bid and won on the construction market. The number of contracts available on the construction market is greatly influenced by four main factors: seasonality, government policy on public contracts, the cost of financing and private consumption. A direct correlation between the construction market and the overall performance of the entire economy has been shown to exist. National economy of each state goes through its economic cycle, which is defined as a swing in total national output, income and employment usually lasting for a period from 2 to 10 years [6]. Similarly, to national economy, its partial sectors go through their market life cycles as well. Economic growth and welfare depend on productive capital, infrastructure, human capital, knowledge, total factor productivity and a quality of institutions [7]. Construction projects are important because economic growth produces constant pressure on the renewal and expansion of the existing infrastructure. However, growth may not be uniform, both intensive and extensive growths may occur. Intensive growth is associated with the growth in labour productivity based on the application of new knowledge in the field of science and technology. Extensive growth is associated with extended contributions of labour and capital at the set technical level. The net intensive and extensive growth currently does not appear, so economic growth can be marked within a certain time period either as mostly intensive or as mostly extensive [3].

Public construction projects act as a multiplier and increase the economic potential of the region. According to Donovan [8] all levels of government routinely, request bids from competing contractors when commissioning construction projects. Public construction is done with open competitive bidding to obtain the best price for quality services, and to prevent favouritism and corruption. Construction contractors bidding on public projects must submit security with their bids to guarantee that if selected, they will execute a formal contract to perform the work according to the terms of their bid.

Company management is charged with increasing the market value of the company. For a company to achieve economic success, it must perform and generate profit over the long-run. The performance of a construction company is defined by the quantity of work it has in its backlog (the volume of contracts under construction and the time needed to complete such contracts), the level of utilization of internal capacities and above all the costs of inputs and the cost of financing. In addition to those provided above, additional factors that have an influence may also be considered, such as the company's corporate culture, which may result in overall lower efficiency in the construction industry [9]. Financial costs are also included in costs involved in cost optimization efforts. Financial costs are directly related to the need to ensure that the company has access to sufficient sources of financing. Financial costs in big construction contracts are set individually by banks. They can be a measure of

efficiency and effectiveness. [10] Efficiency and effectiveness are central terms used in assessing and measuring the performance of organisation.

A construction company as the contractor on a construction project is obliged to supply a bank guarantee for the proper and timely completion of the work and a bank guarantee for the quality of the work over the duration of the warranty period for both public and private investors based on contractual conditions. Bank guarantees (hereinafter only singularly as "BG" or plural as "BGs") are currently issued for use in public tenders.

Generally, a construction contract is characterized by price, financial conditions, quality and period of implementation within bilateral contractual matters. If all conditions remain the same, and given the situation on the market as defined above, company success is dependent on price. In particular, this is the case in tenders for large public contracts where price is frequently the only criteria. Cost accounting, which determines costs for the purposes of subsequent calculations and decision making with regards to pricing, plays an important role in issuing priced bids for construction contracts.

Only companies that maintain financial frameworks at several banking institutions are able to meet deadlines and maintain the ability to flexibly react to changing market conditions. These are used to cover current cash flow needs in order to secure continuous financing for construction costs and to cover the investor's risks based on the concluded contract. The price of financial products for large companies that generally have the ability to cover construction contracts in the range of billions of Czech crowns depend on many measurable and unmeasurable factors. In large companies and large construction contracts these factors are the result of individual pricing policies at financial institutions and reflect the company itself as well as the environment in which it does business. As a result, financial costs associated with construction are variable and fixed.

The problematic issues regarding bank guarantees are not subject to much attention and nearly no specialized literature on these matters exist; the pricing policies of financial institutions on the one hand and the construction companies on the other are considered internal know-how. An undisputed aspect of such guarantees is that they form an indispensable pillar of construction contracts, namely with respect to:

- Liquidity. BGs help release cash and save costs for financing.
- Safety. BGs help limit risk arising from a contract and secure the risk of non-payment.
- Construction. BGs actually facilitate bidding in tenders and the subsequent construction of projects.

2. Price for Construction Contracts

Individually defined bid prices are standard for construction contracts. Many factors have an impact on this price including taxation, the economic cycle, internal management of the company, interest rates on the money market, expected developments on the markets for labour and construction materials, the construction site, etc. Careful preparation of a price is even more important as the length of the contract's production cycle increases (it may exceed a period of 1 year in larger contracts), which likewise increases competitive pressure. Costs and prices have declined even further as a result of the on-going recession.

Construction prices are defined using an itemised budget. An itemised budget includes individually calculated prices for work, prices for subcontracted work and surcharges. The final bid price includes considerations for the market situation, the selected technological process, the conditions of construction and the price level. Market price changes that occur during construction are not necessarily subject to any additional considerations.

There is no generally binding calculation formula or procedure for defining the bid prices of construction projects. For the purposes of this paper, a common calculation formula for the price of construction work using the price for subcontracted work:

- Direct costs. These costs are directly attributable to the individual types of work activities without their concentration or other budgeting.

- Direct costs of labour. These costs include employee salaries and payroll deductions for social and health insurance contributions for employees.
- Direct materials.
- Costs for transporting machinery to the site.
- Prices for subcontracted work.
- Other direct costs. These include transportation equipment, etc.
- Indirect costs. Such costs are not directly incurred by a specific activity but must be budgeted in some form or fashion. They are incurred over the life of the contract or to ensure the operation of the entire company.
 - Production overheads. These are related to the management and operation of construction contracts. They include depreciation of machinery, project management work, costs to prepare and manage construction contracts, construction site establishment, etc.
 - Administrative overheads. These costs are related to company management. They primarily include the depreciation of managed buildings, costs for the work of drivers and operators and their working equipment.
 - Sales overheads. These costs are related to promotion and marketing. In the construction industry it is appropriate to include such costs when preparing construction contracts.
- Profit/loss.

The total bid price is the sum total of the individual line items. The threshold between direct and indirect (overhead) costs is relative. In general, the quality and utility of a calculation rises by adding the largest possible share of costs directly into the calculation unit. With such step, however, the costs to determine direct costs actually increase. The threshold for defining both forms of costs is therefore economic efficiency. The next section of this paper examines financial costs that are related to construction and the price of construction projects.

3. Financial Cost Related to Construction

Financial costs represent the value of consumed financial inputs expressed using units of currency that are materially related to a company's line of business, in this case a construction contract. They include all bank charges resulting from cash transactions and costs associated with providing financial products. These costs are cumulative in nature, identical to other costs. In financial accounting they are reported in Accounting Groups 56 and 57.

Financial costs are included in earnings from financial activities in a more generic sense. The purposes for which such costs are incurred are critical for management. There is a need to differentiate between financial costs included as a part of administrative overheads, i.e. the cost of financing the company as a whole, and financial costs associated with a specific construction contract. In terms of financial products, contractors primarily use bank guarantees, which are the subject of this article, letters of credit, forfaiting, warranty insurance and options to purchase receivables for construction contract management purposes.

In principle there are four categories of costs for using these financial products: interest, commissions and premiums, and direct and indirect costs. Every bank defines the specific price for such products within their individual pricing policies and strategies and there is no way to easily separate and identify such costs due to interconnectivity and conditionality. Of course the creditworthiness of the client and the duration for which such financial product is provided play important roles as well.

3.1. Bank guarantees

BGs are used to secure any type of risk. Valid legislation [11], specifically Section 2029 of the new Civil Code 89/2012, defines a bank guarantee as follows: "A financial guarantee is created with a

statement from the guarantor in a guaranty that it will satisfy creditors based on the guaranty up to a specified amount of money if the debtor fails to fulfil a specific debt to the creditor or if other conditions defined in the guaranty are met. If issued by a bank, a foreign bank or a savings and loan association such financial guarantee is called a bank guarantee."

BGs represent a specific type of guarantee in which the guarantor is a bank. BGs differ from ordinary guarantees in that as a rule neither the principle of subsidiarity nor the principle of accessory are applied, meaning that unless the BG stipulates otherwise, the bank cannot apply any objections raised by the debtor in an eligible manner against the creditor and the bank is obliged to fulfil its obligations when so requested in writing by the creditor. If it is specified that a bank guarantee is payable upon first call and without objections, the bank is obliged to pay such guarantee regardless of whether the debtor has fulfilled a specified task (exclusion of the principle of accessory) or regardless of if the debtor was first called on to provide such fulfilment (exclusion of the principle of subsidiarity).

A BG is a separate, transaction-independent (abstract) obligation to make payment. The bank is not authorized to raise objections on the basis of the given sales case and the burden of proof with respect to the ineligibility of the receivable at the court is held by the debtor.

The guarantee pursuant to [12] can be issued for a definite or indefinite period of time. BGs are divided into a number of types based on their purposes. In order to cover the risks associated with construction, the contractor may employ a non-payment bank guarantee based on the investor's conditions that ensures the fulfilment of an obligation that is not financial in nature. A bank guarantee in this case replaces a cash deposit. If the contractor fails to deliver on its liabilities arising from a contract, the recipient (investor) will receive payment from the valid guarantee from the bank. Individual types of bank guarantees are used depending on the individual phases of construction to cover the specific risks involved:

- Contracting phase of a construction contract.
 - Bid bond. The investor uses a bid bond to restrict the number of bidders to serious parties that do not withdraw from bidding (e.g. signature of a contract, cooperation in concluding the contract and following bid conditions). The validity of such bid bond depends on the valid term of such bid, usually from 90 to 180 days.
 - Letter of confidence. A letter of confidence is a commitment to issue a bank guarantee. It may be required by an investor before an invitation to tender. A bank usually provides a letter of confidence to issue a bid bond in the future if requested to do so by the contractor with a request to submit a bid. A letter of confidence to issue a bank guarantee protects the investor by ensuring that the bidder has sufficient funding available to secure the full completion of the works or warranty period.
- Pre-production phase of a construction contract.
 - Advance payment guarantee. Such a guarantee is issued in the case of deposit payments and usually only 20 to 30 % of the contract is paid against such guarantee. The guarantee provisions are lower than the rate of any loan. Depending on the formulation of the liability, the guarantee may demand return of payment if the contract has not been fulfilled or only if the contractor has not delivered the ordered works. Such guarantee may include a clause regarding a decrease in the amount of the guarantee in connection with completed deliveries. An advance payment guarantee provides the investor with security in the event of withdrawal from the contract, if the contract does not enter into validity, etc. The valid term of such guarantee depends on the delivery terms and should cover the entire construction phase of the construction contract.
- Production phase of a construction contract.
 - Performance bond. This bond ensures the fulfilment of contractual obligations by the contractor. The valid term of such performance bond endures from the signature of the contract to its final fulfilment.

- Post-production phase of a construction contract.
 - Guarantee for warranty obligation. Such guarantee ensures the fulfilment of the obligation to remedy defects and incomplete work discovered during the technical warranty. The valid term of such guarantee matches that of the technical warranty.
 - Retention guarantee. This guarantee is issued as a counter-guarantee to release amounts retained by the investor to the contractor.

The importance of establishing bank guarantees can be demonstrated by their volumes with respect to the revenues of construction enterprises. In civil engineering, the volume of issued guarantees fluctuates around a level of 50 % of completed sales.

Table 1. Amount of agreed guarantees in construction enterprises from 2011 to 2016

Indicator	Unit	2011	2012	2013	2014	2015	2016
Company 1							
Sales	mil. CZK	29,441	30,058	27,061	19,836	14,892	12,619
Bank guarantees	mil. CZK	6,539	14,416	7,703	6,161	6,576	6,067
Share	%	22.21%	47.96%	28.47%	31.06%	44.16%	48.08%
Company 2							
Sales	mil. CZK	12,766	14,810	15,614	13,895	8,995	8,846
Bank guarantees	mil. CZK	4,537	4,015	4,290	4,935	4,366	5,174
Share	%	35.54%	27.11%	27.48%	35.52%	48.54%	58.49%

The agreed available financial framework from which BGs are drawn often exceeds the amount of sales.

3.2. Costs for bank guarantees

The price of a BG is compositional in nature in terms of managing construction costs:

- Fee for issuing a guarantee. This is a fixed portion of the price and is bound exclusively to construction contracts. In terms of costs, this is an indirect fixed cost, specifically production overheads.
- Fees for maintaining the framework on BGs. This is a fixed portion of the price and is bound to the company and to all construction projects. They provide the contractor with flexibility in issuing bank guarantees. The above-agreed framework depends on the amount of sales, i.e. the size of the construction enterprise and its creditworthiness. In terms of managing costs, this is an indirect fixed cost, specifically administration overheads.
- Price for the bank guarantee. This is a variable cost item that is derived from the size of the requested guarantee with respect to the value of the construction contract, the type of guarantee and the duration of the guarantee itself. In some construction contracts the value of the guarantee may reach up to 100 % of the price for the construction contract. In terms of managing costs, this is an indirect variable cost, specifically production overheads.

Table 2. Comparing the costs of loans and BGs [12]

Loan	BG
Cost of money = interest	Cost of money = guarantee provisions
PRIBOR + interest margin	guarantee provisions \leq interest margins
6M PRIBOR = 2.5 % p. a.	
(actually 6M PRIBOR = 0,99 % p. a.)	
Interest margin = 1.5 % p. a.	Guarantee provisions \leq 1.5 % p. a.
Total = 4.5 % p. a.	

In banking institutions, the prices of bank guarantees consider measurable and unmeasurable criteria, in particular:

- Measurable criteria. The size of the enterprise, profitability, liquidity, sales volume, interest rates, work backlog, available financial framework, duration and market share. The following are also considered specific measurable marketing criteria
 - Return of Investment (ROI). The indicator maps the level of return on investments into marketing.
 - Net Buying Influences (NBI). The indicator reflects the percentage of customers with the purchasing power to purchase one or more offered products.
 - Realized Buy. This indicator reflects the quantity of the actually completed purchases initiated by media.
 - Behavioural customer metrics. The purpose is to predict observable behaviour, such as maintaining or increasing consumption. It is the relationship between unobservable measurement of the satisfaction of the customer and the observable measurement of purchasing. This metric includes the customer's decision about what, when, how and where they buy a product or service. Consumer decision-making must be monitored in order to gain new customers and retain existing customers.
 - Obtaining customers. [13] found that a low price increases the probability of acquiring customers, but for a shorter period of time. [14] showed that promotions will enhance the acquisition of customers and can be decisive in the long run.
- Customer Lifetime Value (CLV). CLV [15] is the present value of all future profits, collected from a customer over the life of the customer's relationship with the company. CLV is also defined as an individual customer or segment, so that essentially one customer is worth more to the company than another. CLV involves the possibility that customers may leave and go to competitors. CLV is derived by estimating the expected lifetime of T (based on the retention model) and rating its NPV (Net Present Value).

The CLV formula is:

$$CLV = \sum_{i=1}^T \frac{(p - c)}{(1 + i)} - AC \quad (1)$$

- Unmeasurable criteria. Name of the company, consolidation aspects, payment discipline, contract risks, stability of the region in which the contract is located, the company's potential, goodwill, the company's logo, sponsorship activities and personal contacts.

Specific criteria are the result of the pricing strategies of the individual banking institutions as well as corporate know-how. Large construction companies have a mandatory obligation to provide periodic information within an agreed framework based on the individual requirements of the bank. The bank then defines pricing conditions on the basis of an assessment of the provided information. The range in prices for provided bank guarantees primarily depends upon the length of time for which the guarantee is provided and fluctuates from 0.5 to 5% p.a. on the value of the guarantee. In financial accounting this cost is transposed into Accounting Group 56, Synthetic Account 568 "Other financial costs".

Table 3. Share of bank guarantee costs in a construction company from 2011 to 2016

Indicator	Unit	2011	2012	2013	2014	2015	2016
Other financial costs	mil. CZK	126.78	116.29	188.20	143.80	65.46	108.86
Costs for BG	mil. CZK	25.84	21.06	28.23	29.39	26.81	23.31
Share	%	20.38%	18.11%	15.00%	20.44%	40.96%	21.41%

4. Bank Guarantees in Construction Contract Bid Prices

There is no binding procedure for defining bid prices. The bid price of a construction contract is the most valuable of all know-how and is only "entrusted" to a very restricted group of employees.

Most often financial costs for BGs are included in production overheads or may be defined as a separate line item in the bid prices. The share of variable indirect costs in the bid price of an contract is illustrated in an example of a public construction contract with a total estimated value of CZK 7,227,958 thousand excluding VAT with a construction term of 56 months. The investors are required to provide the following types of guarantees and the following costs are associated with such guarantees:

- Bid bond totalling 5 % of the price of the works, i.e. CZK 361,398 thousand for the binding term of the bid of 90 days.
 - One time issuing fee: CZK 5 thousand for the bid bond.
 - Price of the bid bond: 0.5 % p. a. of the amount of the bid bond.
- Letter of confidence totalling 10 % of the price of the works, i.e. CZK 722,796 thousand for the binding term of the bid of 90 days.
 - One time issuing fee: CZK 5 thousand for the letter of confidence.
 - Price of the letter of confidence: 0.85 % p. a. of the amount of the letter of confidence (generally the guarantee commission is higher as it includes the validity of the assured guarantee).
- Performance bond totalling 15 % of the price of the works, i.e. CZK 1,084,194 thousand for the duration of construction, i.e. 56 months.
 - Issuing fees: CZK 5 thousand for the performance bond.
 - Price of the bid bond: 1 % p. a. of the amount of the performance bond.

The breakdown of prices provided in Chapter 2 "Price for construction contracts" is used to define the bid price. Given the fact that BG costs are calculated from the price of the construction work inclusive of profit, it is appropriate to define these costs as a separate overhead item to the bid price.

Table 4. Model example: Share of bank guarantee cost in bid price

Indicator	Unit	Price	% share
Direct costs	mil. CZK	5,728	81.27%
Direct materials	mil. CZK	3,453	48.99%
Direct costs of labour	mil. CZK	1,226	17.40%
Other direct costs	mil. CZK	115	1.63%
Subcontracted work	mil. CZK	934	13.25%
Indirect costs	mil. CZK	1,320	18.73%
Production overheads	mil. CZK	708	10.05%
Administrative overheads	mil. CZK	612	8.68%
Profit	mil. CZK	180	2.55%
Bid costs	mil. CZK	7,048	100%
Costs for BGs	mil. CZK	53	0.75%
Price of bid bond	th. CZK	452	-
Price of performance bond	th. CZK	50,596	-
Price for letter of confidence	th. CZK	1,536	-
Fees for bid bond, letter of confidence and performance bond	th. CZK / total of 3	15	-

5. Results and discussions

The assumption in the model example is that the contract reached the implementation phase. If real life followed the depiction in the example, then the management of BG costs would be very simple. Understandably, reality is much more complicated. The problem is that everything is dependent on specific contracts. Bank frameworks are agreed for the company as a whole and various BGs for specific bids/letters of confidence may not move into the implementation phase if a bid is not accepted. What then is the most accurate possible method for illustrating these costs in connection with variability for the purposes of their management?

BG costs can be broken down using an appropriate solution into:

- Variable BG costs (hereinafter only NBZ_{var}). BG costs connected to specific contracts, i.e. the costs of the BG in the implementation phase.
- Fixed BG costs (hereinafter only NBZ_{fix}). BG costs for construction contracts during the bidding phase and costs for maintaining the bank framework.

NBZ_{fix} dissolution methodology is based on the annual sales plan (hereinafter only TR_{pl}). NBZ_{fix} can be assigned using a method based on the ratio of the initial balance of NBZ_{fix} ($PSNBZ_{fix}$) and the increase in NBZ_{fix} ($PRNBZ_{fix}$) with respect to the annual sales plan (TR_{pl}). If a bid is accepted as the winning bid (PRTR), the expected decrease in fixed costs ($VYNBZ_{fix}$) can be expressed as follows:

$$VYNBZ_{fix} = \frac{PRTR}{TR_{pl}} \times (PSNBZ_{fix} + PRNBZ_{fix}) \quad (2)$$

Maintaining separate records of fixed costs for BGs from variable costs in the manner shown above facilitates an increase in the efficiency of managing financial costs related to the preparation and specification of bid prices for construction contracts.

6. Conclusions

Insufficient attention is given to all of the issues related to financial guarantees and the depiction of their costs in the cost price of construction contracts; this contribution shows that their share in the cost price is not negligible. The importance of BGs rises during periods of recession and logically from the increased risk that the investor must face. An accurate depiction of the costs incurred for BGs has proven to be very complicated in reality. In later research the questions can be posed of how the maintenance of a financial framework contributes the pricing policies used for contracts. Other questions include what factors are important for investors when making decisions on the requirements of bank guarantees and how these are exhibited in cost prices.

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