USE OF EXTERNAL SOURCES OF FINANCING
IN THE CONSTRUCTION INDUSTRY

Irena Honková

Abstract: *This article analyzes the use of external sources of financing in the construction industry. The article responds to the claim that managers of companies in the construction industry prefer bank loans and the fact that a large volume of bank loans failed to their default. The task of this article is to map the current business situation, and the use of external financing types. The survey method chosen was empirical inquiry. It was necessary to determine the size of a representative sample as the entire population was too large. The questionnaire survey revealed that the most frequently used sources of financing include unpaid invoices to suppliers and advances received from customers. Bank loans as initially preferred tool for external financing placed on the third place. Given that the two main sources of financing are short-term nature of resources there are concerns that companies financed with short-term funds also fixed assets and therefore so have solvency problems.*

Keywords: *External sources, Financing, Construction industry, Unpaid invoices, Bank loans.*

JEL Classification: *G00.*

Introduction

The construction sector is an important sector in the national economy. If industry contributes 30 percent to the national economy, the construction sector accounts for nearly a quarter of that of industry. [27]

In general, construction is a mirror of the overall condition of the economy. The main factors influencing this sector include an increase or decrease in the volume of public tenders, business development and consequently the construction of production facilities or non-productive buildings for administration and commerce. Unemployment has a major impact on housing, as does income, population and also the cost and availability of credit. [17]

The construction sector was deeply affected by the ongoing economic crisis in 2009 and 2010, as evidenced by the proportion of failed loans of up to 28%, the highest of all branches of industry. [28]

Prasilova [23] shows the total debt of the construction industry.

Financing has an influence of financial stability of company. [11]

By this time in the Czech Republic, bank credits have been very popular in general as a source of external financing and preferred over other financing instruments. [25]

The task of this article is to map the current business situation, and the use of external financing types.

1 Statement of a problem

1.1 Objectives and Hypotheses

The aim of this article is to analyse the current representation (especially long-term) of external sources of financing in the construction industry, as it is likely that, in response to the enormous failure rate of loans, banks have begun to evaluate loan applications much more carefully. Bank loans thus may have become, particularly for many construction companies, quite inaccessible, and so have been forced to use other means of external financing.

Hypothesis H0 is being tested here, where: "All forms of external financing are used equally the same", where, in the event of a lack of confirmation, an analysis will be effected which rejects the factors of this hypothesis.

Companies with a legal form of joint stock company will be analysed, as stock companies have the widest selection of instruments for financing, including issuing shares.

1.2 Options of External Financing

A synthesis of knowledge in the field of financial management was determined following eleven forms of external financing: [1, 2 ,3 ,5 ,8 ,9 ,14 ,17 ,20 , 21 , 26 ,31]

- Issuing new shares.

- Long-term bank credits and loans.

- Financial leasing.

- Issuing bonds and debentures.

- Short-term liabilities to suppliers.

- Advances received.

- Forfaiting.

- Subsidies and grants.

- Projected financing.

- Options, futures.

External sources are more diverse than internal resources. Their diversity is related to developments and innovations in financial markets. [23]

In addition to traditional forms of financing such as bank loans and financial leasing, research shows the popularity of other financial instruments.

Because it is not the purpose of this paper to specify in detail the various forms of external financing, the following text lists particularly their main advantages or disadvantages.

As mentioned in the introduction, companies in the construction industry could have a difficult time gaining access to bank loans due to issues with repayment.

Among the disadvantages of financial leasing is the fact that the costs of financial leasing may be higher than the expenses for financing investments purchased with equity or other foreign capital. [31] The owner of the leased asset for the duration of the lease agreement is the creditor – the lessor. [13]

Issuing new shares is, in this listing, the sole representative of equity. Issuing shares has a diluting effect on existing owners (shareholders). The process of issuing lays a number of administrative and legislative conditions on a joint stock company; another disadvantage is that it is also time-consuming. [13]

Issuing bonds and debentures is more suitable for large companies due to the issuing costs [31]. An advantage is the tax deductibility of the interest, unlike paid dividends.

For businesses exceeding a certain level of indebtedness, bank loans cease to be suitable and issuing bonds is an alternative with lower costs due to risk diversification among a large number of creditors. [30]

Forfaiting is considered to be an attractive method of financing which allows suppliers (exporters) to receive cash payments on delivery, unconditionally transfer monetary and exchange rate risks to the forfaiter and get rid of the administration associated with the records or recovery of outstanding debts. [7]

Subsidies and grants are generally intended for a specific purpose; they do not belong among general funding sources and are not generally applicable.

Special financial instruments can include derivatives in the form of options and futures. Derivatives are financial instruments that require no initial investment, as it will be settled in the future. Options and futures are different in law as to how these derivatives are used in the future. Unlike futures, which is a fixed term transaction whose value varies depending on the underlying variables, options do not constitute a right (obligation) to carry out this transaction, if the value of the underlying variable changes to a detriment. [6]

Project financing is particularly suitable for financing large projects where there is a financial link between, say, the prime contractor and the bank.

All of these financial instruments entail the cost of capital, as opposed to raising capital through an obligation to business partners. These obligations are advances received from customers and in particular the obligations to suppliers.

2 Source Data and Methods

For the analysis and testing the hypotheses H0, our own data from the questionnaire -based research will be used. This empirical method was chosen for the reason that the businesses monitored were within the Czech Republic. The advantage was thus the ability to directly address a variety of respondents over a wide area and to have sufficient time to come up with responses.

The basic statistical population which meets the conditions for a legal form of joint stock company and with an activity code of NACE 4120 - the construction industry by the Administrative Business Register includes 2207 companies. [22]

Due to its size, it was necessary to select a sample that represents the basic population for the statistical evaluation. The required sample size varies depending mainly on the variability (standard deviation) the occurrence of a character investigated in the basic population, the desired level of precision (error) estimate and the coefficient of reliability. [15]

With a properly established sample size, we will reach a sufficient quality of generalising conclusions. [10]

Because we do not know the distribution of respondents' answers, we will use a formula to calculate the sample size [15]:

$$n \geq \frac{z^2 x \, p*q}{\Delta^2} \tag{1}$$

where:

n is the minimum number of respondents

z is the reliability coefficient determined by us,

p, q are the numbers of respondents in percent biased towards contradictory variations; if these numbers are not precisely known, a maximum product must be created, i.e., 0.5 x 0.5,

Δ^2 is permissible error estimation.

We do not know if the variance in the population σ^2, we must be estimated using sample variance. Use the pre-selection, ie. a random selection of small-scale n_1 elements and calculate it the sample variance. The minimum sample size then we get [11]:

$$n \geq \frac{t^2_{1-\frac{\alpha}{2}} * s'^2_x}{\Delta^2} \tag{2}$$

where:

$t_{1-\alpha/2}$ is percentiles division,

Δ is permissible error estimation and

s'^2_x is the sample variance.

If we have doubts about the original shape of the distribution, taking at least $n_1 \geq 30$ percentiles and replace t distribution percentiles of normal distribution. Practically further we proceed so that after the detection of the desired sample size n enter preselection n_1 (when $n > n_1$) of n_2 elements so that $n_1 + n_2 = n$. [11]

In 2013, it was a written questionnaire addressing a total of 314 enterprises. Completed questionnaires were returned 30. This pre-selection was calculated sample variance of 0.04.

Substituting into equation (2) implies that the required number of respondents is 45. It was therefore necessary to obtain a questionnaire from another 15 companies.

$$n \geq \frac{2^2 * 0,2*0,2}{0,06^2}$$

$$n \geq 45$$

In the next round they were approached businesses that did not respond to a written questionnaire. Questionnaires were sent this time after a telephone conversation with the manager of the company directly to the addressee's name. This significantly increased the return - of the surveyed 30 questionnaires returned 22 questionnaires. 4 replies were received subsequently from the previous round.

In total, during the pre-selection and the actual survey, we succeeded in getting 56 questionnaires. The condition of representativeness of the sample was thus fulfilled.

As already mentioned, the research was conducted using a written questionnaire. Because of the generally low rate of questionnaires was part of a motivational cover letter.

Of course there was enclosed stamped envelope with a return address. In the cover letter, the respondent was aware of the content and objective research.

The task of respondents was: "Sort in order of 1-11 various forms of external financing, according to their usage in your company. (Utility 11 - the most widely used, 1- least used.)" see Tab. 1.

Tab. 1: Questionnaire

Form of external financing	Order (11 most used, 1 – least used)
Issuing new shares.	
Long-term bank credits and loans.	
Financial leasing.	
Issuing bonds and debentures.	
Short-term liabilities to suppliers.	
Receiving advances.	
Forfaiting.	
Subsidies and grants.	
Projected financing.	
Options, futures	
Other (state which)	

Source: [own]

The analysis of the use of individual sources of external financing is carried out by common descriptive statistical methods, i.e., an arithmetic average, Min and Max methods and calculating the standard deviation.

Data supporting the hypothesis H0 are subjected to testing using the non-parametric Friedman Test, as there were doubts concerning the normality of the distribution, see, e.g. Fig. 1.

Fig. 1: Chart showing usage of the forms of external financing
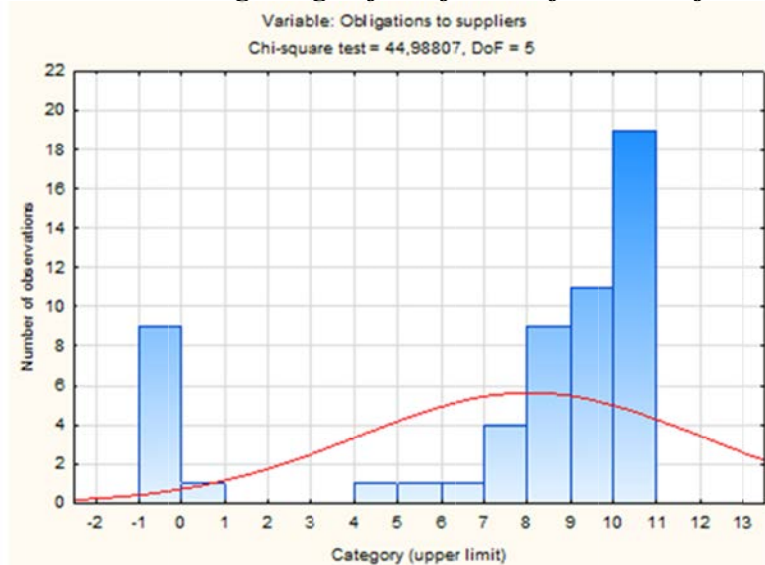
Source: [own]

The Friedman Test does not assume selections from a normal distribution and compliance of variances in groups. We test that the random variables Yi1, YI2 ... Yik are identical. The test criterion is a random variable: [16]

$$Q = \frac{12}{IJ\,(J+1)} \sum_{j=1}^{J} \left(\left(\sum_{i=1}^{I} R_{ij} \right) - 3\,I\,(J+1) \right) \tag{3}$$

where:

I is the number of respondents

J is the number of characters (classes),

R_{ij} is the order.

The critical area is expressed as: $W = \{Q: Q > \chi^2\,J\text{-}1,\,\alpha\}$

Descriptive statistical methods and the nonparametric Friedman Test were performed with Statistica software (Tab. 2 and Tab. 3).

## 3 Analysing the Use of External Forms of Financing and Discussion

The results of the survey gave interesting results. Tab. 2 shows the average, minimum and maximum number of points for each variant of external financing. Bank loans, the preferred tool of external financing in the period before the economic crisis, fell to third place with an average evaluation of 6.85 points. Before this are advances received from customers and in particular the obligations to suppliers. On the contrary, insignificant tools are those like issuing shares and bonds, factoring and financial derivatives, most likely mainly because of the increased administrative burden. A chart was also created from the data collected (Fig. 2) showing the popularity of the various instruments of external financing.

Tab. 2: Analysis of the usage of forms of external financing

Form of external financing	Descriptive statistical methods				
	Quantity	Average	Min	Max	Standard deviation
Issuing new shares	56	0,55357	0	5	1,27806
Long-term bank credits and loans	56	6,85714	0	11	4,53042
Financial leasing	56	4,73214	0	11	4,52263
Issuing bonds and debentures	56	0,50000	0	8	1,50151
Short-term liabilities to suppliers	56	8,05357	0	11	3,96081
Receiving advances	56	7,00000	0	11	4,06314
Forfaiting	56	1,78181	0	11	3,55221
Subsidies and grants	56	3,08992	0	11	3,90001
Projected financing	56	2,57142	0	10	3,65243
Options, futures	56	0,69642	0	6	1,66154
Other	56	1,43636	0	11	3,07778

Source: [own]

Fig. 2: Chart showing usage of the forms of external financing
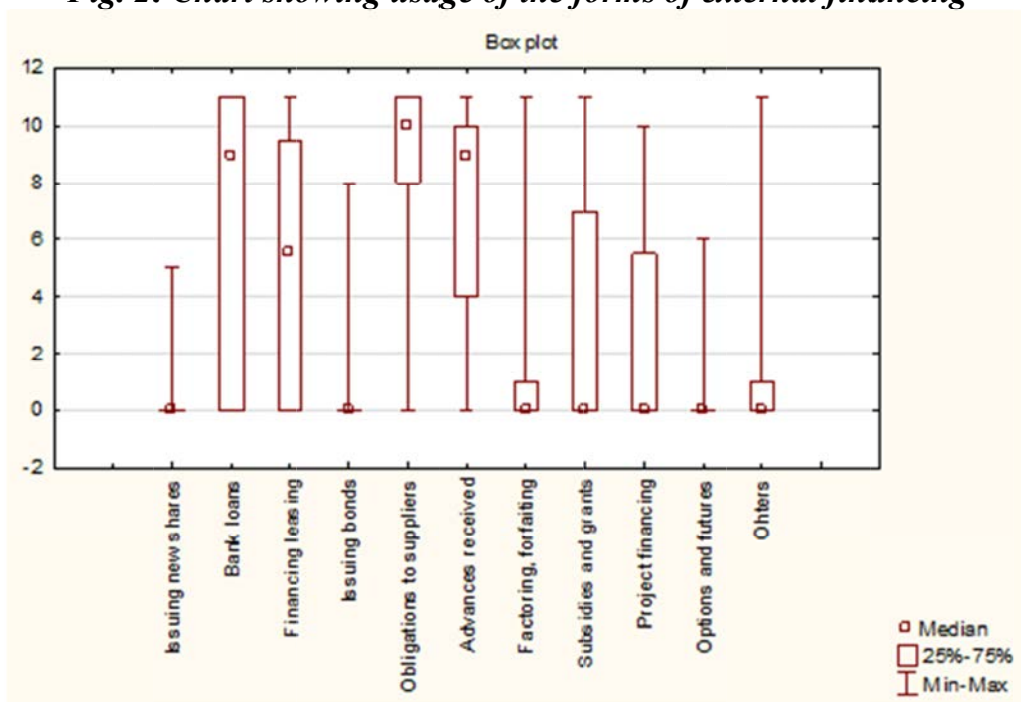
Source: [own]

Results of the descriptive statistics (Tab. 2, Fig. 2) basically already gave an answer to the hypothesis H0; the Friedman Test then simply verified the conclusions.

The Friedman Test requires that the individual answers to the questionnaire (Tab. 1) be adjusted to a statistical order. These data were subsequently tested in the Statistica software, see Tab. 3.

Tab. 3: Results of the Friedman Test

Form of external financing	Friedman Test = 0,39547, Chi-square test (N = 56, DoF=10) = 221,4625			
	Average order	Sum of order	Average	Standard deviation
Issuing new shares	7,723214	432,5	7,448214	2,060361
Long-term bank credits and loans	3,991071	223,5	3,892857	2,684491
Financial leasing	5,026786	281,5	4,839286	2,488349
Issuing bonds and debentures	7,892857	442,0	7,723214	1,455146
Short-term liabilities to suppliers	3,133929	175,5	2,991072	2,037135
Receiving advances	3,741071	209,5	3,607143	1,990236
Forfaiting	6,723214	376,5	6,526786	2,355689
Subsidies and grants	6,142857	344,0	5,982143	1,988522
Projected financing	6,562500	367,5	6,357143	1,999351
Options, futures	7,714286	432,0	7,544643	1,121188
Other	7,348214	411,5	7,214286	2,095140

Source: [own]

The Friedman Test confirmed that the differences in the use of various tools of external financing are significant enough that the null hypothesis cannot be confirmed. Businesses do not utilise all sources of external financing the same. The most popular strategic decision-making methods are the strategic scenarios – 50,94 % [17].

The Friedman Test shows the differences in the use of these resources. Of course, it is not only a question of popularity, but also the availability of capital; grants and subsidies for example, would undoubtedly be very popular, if they were widely available.

Most important and most alarming, however, are the first two places in the ranking of outside sources; therefore we will pay attention to them particularly in the conclusion.

Conclusion

The questionnaire survey and subsequent testing did not confirm the hypothesis H0: "All forms of external financing are used equally the same".

It showed a preference for traditional instruments of external financing, although bank loans placed third in the ranking. It is likely that the large volume of failed loans during the economic crisis is responsible for the reduced state of loans provided, as mentioned in the introduction. However, the dismal financial state of construction companies transferred debts to suppliers and an increase in advances received from customers.

Obligations to suppliers and advances from customers are instruments of external financing which should belong to short-term funding sources [14]. At present, however, the reality is that long-term assets are covered by short-term liabilities (the construction industry has a large proportion of long-term assets to total assets [4]. This violates one of the basic rules for financial management. [18, 19]

If the companies monitored have their funding based mainly on short-term liabilities, it is likely that a large portion of these liabilities is in payment arrears. On the other hand, these companies also have a large proportion of debts [4], so they are probably in secondary insolvency. In any case, it is apparent that the construction industry is not in a good financial situation.

This article shows how the problem of financing is dangerously captivating. A number of companies unfortunately suffer from this fact; companies that move towards the edge of bankruptcy not because they had no orders and thus attain economic losses, but due to financial insolvency.

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Contact Address

Ing. Irena Honková, Ph.D.
University of Pardubice, Faculty of Economics and Administration,
Institute of Business Economics and Management
Studentská 95, 532 10 Pardubice, Czech Republic
Email: irena.honkova@upce.cz
Phone number: +466 036 163