

Bolek, Monika; Wili'nski, Wojciech

Article

The influence of liquidity on profitability of Polish construction sector companies

e-Finanse: Financial Internet Quarterly

Provided in Cooperation with:

University of Information Technology and Management, Rzeszów

Suggested Citation: Bolek, Monika; Wili'nski, Wojciech (2012) : The influence of liquidity on profitability of Polish construction sector companies, e-Finanse: Financial Internet Quarterly, ISSN 1734-039X, University of Information Technology and Management, Rzeszów, Vol. 8, Iss. 1, pp. 38-52

This Version is available at:

<https://hdl.handle.net/10419/66742>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

THE INFLUENCE OF LIQUIDITY ON PROFITABILITY OF POLISH CONSTRUCTION SECTOR COMPANIES

Monika Bolek,¹ Wojciech Wiliński²

Abstract

The concept of financial liquidity is not very straight, as it has various aspects, although generally it refers to the current assets and liabilities management. Financial liquidity together with profitability are the core categories of enterprise activities which, in order to function efficiently, the company should treat as equally important. The growth of financial liquidity may negatively influence the company profitability. If the company is to liquid in the static sense than it will affect negatively the profitability since some capital will be frozen in current assets. In this article, the authors analyze theoretical aspects of the relation between liquidity and profitability, whereas the empirical part they examine this interdependence on a group of construction sector companies listed on Warsaw Stock Exchange.

JEL Classification: G31, M21

Keywords: liquidity, profitability

Received: 16.08.2011

Accepted: 16.02.2012

Introduction

The article was written as a response to a dynamic development of the construction sector in Poland, connected with the coming Euro 2012 football championship. Moreover, EU funds available within structural funds increase the development effect of construction companies through greater investments. The construction sector is one of the biggest employers in the market, therefore appropriate liquidity management in these companies may guarantee their development and stable employment. KPMG – the advising company – predicts that the construction sector will grow by 3.4% in 2011 and 1.5% in 2012. An increasing number of companies are considering their development through finding a strategic partner – at present as many as 79% of the analyzed enterprises declare their interest in alliances. Moreover, 81% of small and medium-sized enterprises and three out of every four engineering construction companies also declare their willingness to obtain a strategic partner. We can notice thus that managers anticipate their future situation when they will be forced to look for new markets and compete with foreign companies. The analysis of liquidity and profitability in enterprises operating in this sector is related to the evaluation of these companies' operations and tries to find the answer to the question whether there is a relation between liquidity and profitability and what direction such relation has. In addition, the analysis included in this article will allow us to identify the variables which are of key importance to the construction sector.

Liquidity may be understood as a static picture of an enterprise resulting from its balance position or as a ratio of cash conversion cycle, which is considered to be dynamic and better suiting

¹ Dr Monika Bolek, University of Lodz, Chair of Economics of Industry and Capital Market, ul. P.O.W.3/5, 90-255 Łódź, mbolek@ki.uni.lodz.pl.

² Mgr Wojciech Wiliński, wwilinski@gmail.com.

the managers' needs. The issues of profitability, its types and relation with company liquidity will be discussed in the theoretical part of this article. Richards and Laughlin (1980) used the cash conversion cycle to analyze financial liquidity and stated that traditional indicators are static and they do not reflect the dynamics of the conversion ratio presented originally by Hager (1976). Therefore in the model built for the purpose of this analysis, the authors use both the dynamic and the static ratios to determine which of them is more related to profitability.

Liquidity

Company liquidity and the ratios which reflect it are the basis of theoretical considerations in this point.

The concept of financial liquidity

Liquidity can be defined in three contexts, we can distinguish the asset, asset-equity, and cash aspects of financial liquidity. The asset aspect of financial liquidity, which is financial liquidity of company's assets – is the ability to convert assets into cash in the shortest possible time, at the lowest possible costs and without losing their value. Appropriate resources of liquid elements of the assets, including cash, are the enterprise's protection against the loss of financial liquidity.

The most common and the most frequently used concepts of financial liquidity concern mutual relations between current assets and those current liabilities which are financed from current assets. This is then the asset-equity aspect of financial liquidity (Wędzki, 2003, p. 33). Financial liquidity of an enterprise may be defined as the ability to settle its liabilities (short-term ones, payable within one year) on time, determining the possibility of paying these liabilities in a situation when they become due instantly, through liquidizing possessed high-liquidity assets (current assets). Financial liquidity of an enterprise is better when larger part of its assets are high-liquidity elements, and worse when the opposite is true. The mutual relationship between assets and liabilities in shaping financial liability also requires that we pay attention to the quality of our debts. Financial liquidity is better when the due time of their payment is distant, that is when current liabilities constitute a smaller part of all liabilities. Therefore, if an enterprise wants to maintain high level of financial liquidity, it must possess a large share of cash and high-liquidity assets and a small share of short-term liabilities.

The enterprise's solvency is defined not through the quality (size, structure, liquidity) of the possessed current assets, but by the generally understood ability to pay with cash. This possibility is determined by cash flows, therefore company solvency is a cash aspect of financial liquidity (Kusak, 2006, p. 10).

In financial liquidity theories we distinguish static and dynamic measurement of financial liquidity. Static measurement relies on data included in the balance sheet, while dynamic measurement uses data from the cash flow account.

Liquidity ratio

Static measurement of liquidity determines the relation between current assets and short-term liabilities. The ratios based on this relation are the relationship of various ranges of current assets with different liquidity levels to short-term liabilities. They reflect, thus, various degrees of financial liquidity of an enterprise (Nowak, 1996, p. 194). There are three basic ratios of financial liquidity.

Current ratio (CR) – III degree liquidity ratio

$$CR = \frac{CA}{SL}$$

where:

CR – current ratio

CA – current assets

SL – short-term liabilities

The current ratio is the most frequently used one (Czekaj and Dresler, 2001, p. 211). It offers a general view of the company liquidity and is a starting point of its analysis. It defines to what degree current assets cover short-term liabilities. It determines then potential ability of an enterprise to pay all its current liabilities through liquidizing possessed resources of current assets. The higher the value of the ratio, the higher this ability is.

Quick Ratio (QR) – II degree liquidity ratio

$$QR = \frac{CA - I}{SL}$$

where:

QR – quick ratio

I – inventory

The least liquid element of current assets are inventory. To obtain the liquidity measure on the basis of a group of assets which are easier to sell, we separate them from the current ratio. The quick ratio shows to what degree short-term liabilities are covered with the most liquid current assets.

Acid Test (AT) – I degree liquidity ratio

$$AT = \frac{C}{SL}$$

where:

AT – acid test

C – cash and short-term investments

The cash liquidity ratio (acid test) is the least frequently used ratio, being usually a supplement to other ratios (Ciciorko, 2010, p. 89). It reflect only the most liquid part of current assets, which is monetary resources, including perfectly liquid cash. It shows what part of liabilities the company could pay immediately using its money.

The dynamic measurement of liquidity is based on cash sufficiency ratios. They show the ability of an enterprise to settle necessary expenses and liabilities using the money generated in the operational activity of an enterprise. They inform to what extent cash covers expenses and liabilities, and thus determine the solvency possibilities of an enterprise. Generally, the higher their value, the better solvency (Sierpińska and Wędzki, 1997, p. 52). In the further part of the article we will use the most important cash sufficiency ratios.

The key ratio of cash conversion is the cash conversion cycle. This cycle is determined by ratios of the cycles of other current assets taking part in the cash cycle, that is inventory, receivables and short-term liabilities.

Below we will present and describe all the above ratios, with cash conversion cycle at the end, as the general conclusion and synthesis of the current assets management.

Inventory conversion cycle is calculated using the following formula:

$$ICC = \frac{I}{CGS} \times n$$

where:

ICC – inventory conversion cycle

I – average level of inventory

CGS – cost of gross sales

n – number of days

Inventory conversion cycle determines the time (in days) between the purchase of raw materials and manufacturing products out of them and their sale (or only re-sale in case of trading enterprises).

Receivables conversion cycle:

$$ARC = \frac{AR}{S} \times n$$

where:

ARC – receivables conversion cycle

AR – average level of receivables

S – sales

Receivables conversion ratio determines the time between the sale of products (or goods), that is the origin of receivables and obtaining cash for them.

Liabilities conversion cycle:

$$SLC = \frac{SL}{CGS} \times n$$

where:

SLC – short-term liabilities conversion cycle

SL – average state of short-term liabilities

The short-term liabilities conversion cycle determines the average period of paying short-term debts by an enterprise. Assuming that a company always pays debts on time, it can be interpreted as their average time of settlement.

Cash conversion cycle (CCC)

$$CCC = ARC + ICC - SLC$$

where:

CCC – cash conversion cycle

Cash conversion cycle defines the time between expenditure of cash for payments of liabilities and receiving cash as payment of receivables. In practice it means the period between making actual payment for materials and receiving payment for the sales of manufactured goods (Brigham and Gapenski, 2000, p. 119). Another interpretation states that it is a number of days in which an enterprise finances operational activity using long-term capital or, if it is insufficient, refinanced loans. Negative cash conversion cycle means the period in which an enterprise is credited by its trade partners (Wędzki, 2003, p. 333).

Profitability measurement

Assets profitability ratios are the relation of income net to total assets involved in company activities. They show what amount of financial result is generated by a cash unit of the assets.

Return on assets (ROA)

$$ROA = \frac{IN}{TA} \times 100$$

where:

ROA – return on assets

IN – income net

TA – total assets

Return on assets ratio is a basic measure of the profitability of all assets and reflects its earning power.

The ratios of own equity profitability constitute a relation of the financial result to own equity, showing what amount of profit (loss) is generated by its monetary unit.

Return on equity (ROE)

$$ROE = \frac{IN}{E} \times 100$$

where:

ROE – return on equity

E – equity

The return on equity ratio is a key ratio in evaluating profitability. The difference between this ratio and the return on assets ratio in a rough approximation expresses the level of financial leverage.

Liquidity v profitability

Liquidity and profitability are two fundamental categories of company activities, constituting the basis of its evaluation (Szczepaniak, 1996, p. 35). Striving to maintain financial liquidity on a high level indicates keeping a large share of current assets, especially cash. This increases the financial liquidity level, and companies which quickly, without any delays, settle their liabilities in cash may expect to obtain some discounts from their suppliers and clients, enjoy greater trust of loan-providers who analyze liquidity before granting loans, and most of all, it diminishes the risk of insolvency.

On the other hand, maintaining too big share of current assets may be disadvantageous for the company profitability. This is especially true about the excess cash in relation to expected expenses and this part of products or material inventory which does not participate in the current turnover, and thus do not contribute to generating profit and are only some kind of security for unexpected events, such as sudden boost of demand or problems with supplies. Moreover, receivables, belonging to current assets, are only potential means, whose reception cannot be guaranteed, and which could be used more effectively with more efficient open account policy. The surplus of cash, inventories and receivables constitute the excess current assets and generate the cost of lost opportunities. The cost of lost opportunities is the loss of potential profit which would be earned if some resources frozen in current assets were allocated for the undertakings increasing company profitability. The resources frozen in the excess current assets could be allocated for investment in fixed assets, such as buildings, machines, equipment and vehicles, which, if used appropriately, account for the company production potential and thus its income possibilities (Gajdka and Walińska, 2004, p. 466). If there is no need to invest in fixed assets, the excess of the resources frozen in current assets could be located in long-term capital investments, such as deposit accounts or shares in another enterprise. Maintaining excessive level of inventories, apart from the costs of lost opportunities, generates additional

costs related to storing and insuring them – the higher the level of inventories, the higher the costs of keeping them. Moreover, in case of inventories stored for a long time the company may bear the costs resulting from their deterioration or aging, experiencing the loss amounting to their total value (Gajdka and Walińska, 2008, p. 467).

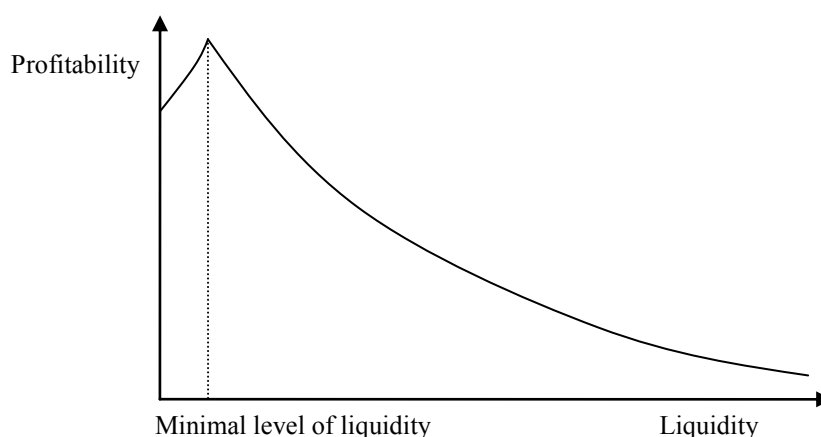
Engaging resources in current assets brings some benefits and losses. If the losses (in shape of the cost of lost opportunities) begin to exceed the benefits, it means that the further growth of current assets, though increasing security of financial liquidity, may contribute to the decline in profitability. The level of liquidity and profitability depends not only on assets structure, but also on the structure of its financing sources. Apart from the equity contributed by owners or obtained from retained profits, in economic reality an enterprise must partly finance its activities using financial obligations. Own equity usually is not sufficient to perform all necessary undertakings, and, in addition, with high profitability, using loan capital brings extra benefits in shape of the financial leverage effect. From the perspective of financial liquidity, the most essential issue is that of the share of short-term liabilities in capital financing undertakings.

The smaller the share of short-term liabilities, the higher the level of financial liquidity, as the number of payables to be settled in the nearest time is decreasing. This means that a greater part of assets is financed with own equity and long-term liabilities, which are relatively expensive (Gajdka and Walińska, 2008, p. 468) (they are characterized by greater risk that short-term loans from the perspective of capital owners, so their cost must be bigger). Higher cost of capital causes bigger operating costs, which decreases profits and lowers profitability of assets. On the other hand, high share of short-term liabilities in capital causes low level of financial liquidity, but trading and tax liabilities included in it, if paid on time, do not generate any interests. Current liabilities thus are relatively cheap and, as they do not constitute a big cost of company activities, contribute to increased profitability of assets.

The sources of financing assets have an opposite influence on the level of liquidity and profitability that the assets as far as enforceability is concerned (the period of time needed for liquidizing assets and paying back capital). The greater the share of short-term liabilities in all liabilities, the lower the level of liquidity and higher profitability of an enterprise.

The relations between financial liquidity and profitability in light of the arguments presented here is shown in Figure 1.

Figure 1: Relation between company liquidity and profitability



Source: Own elaboration on the basis of: Gajdka, J., Walińska, E. (2008). *Zarządzanie finansowe. Teoria i praktyka*, vol. 2., Warszawa: Fundacja Rozwoju Rachunkowości w Polsce, I edition, p. 467

The growth of the share of current assets in total assets causes higher level of financial liquidity, however, it may lower profitability. The growth of short-term liabilities in total liabilities, on the other hand, causes lower level of financial liquidity, but contributes to higher profitability of assets. We can observe then negative relation between financial liquidity and profitability of an enterprise. We should emphasize though, that this relation exists when we maintain a certain minimal and critical level of financial liquidity.

When the level of financial liquidity falls below some minimal level, further fall of liquidity is accompanied by fall of profitability. Too low level of liquidity in an enterprise makes it impossible to settle its payables on time, and cause a series of sanctions and penalties and accounts for the unwillingness of contractors to cooperate with this enterprise in future. This lowers obtained profits and in extreme situations in the next stage it may lead to company insolvency and bankruptcy. An enterprise may maintain liquidity without obtaining profits as well as it may be profitable and not settle its current liabilities. However, both situations may appear only for a short time. In the long run, liquidity is necessary to obtain profits and profits are vital for the company's development, and so for maintaining its future liquidity and solvency. An enterprise managed on the basis of only one of these areas will not achieve its highest efficiency.

Profit is a certain type of economic source of financing the future development of an enterprise, while financial liquidity reflects its real current possibilities of financing and so it is the determinant of its continuity on the market (Wojciechowska, 2001, p. 232). For efficient operations of an enterprise it is necessary to achieve optimum levels of both financial liquidity and profitability.

The analysis of the influence of financial liquidity on profitability of construction companies

Our article will present the survey conducted on construction sector companies listed on Warsaw Stock Exchange, aiming at establishing whether in their case financial liquidity influences profitability, and possible indicating the direction and power of this influence.

The choice of financial liquidity and profitability measures

In order to perform the analysis of the influence of financial liquidity on company profitability, we should select appropriate measures which will represent both categories.

In the context of the influence of financial liquidity on profitability we should take into account 'universal' profitability of a company, that is the one which reflects company operations in the broadest possible aspect. The most synthetic profitability ratio is ROA. It refers to total resources of an enterprise and thus best reflects the effectiveness of total operations of an enterprise. Moreover, as it reflects total assets (in denominator), it has a lower amplitude of value fluctuations from the most general ratios of sales and equity profitability.

The choice of financial liquidity ratio is much more complicated.

Cash sufficiency ratios, focusing on cash flow, generally are the best ones to refer to the ability to settle payables. They should not, however, be used as financial liquidity ratios in the analysis dealing with profitability, as they are based on data created by means of cash basis, while profitability relies on data created by means of accruals basis. Profitability refers to physical flow and solvency concerns cash flow related to it, which accounts for the fact that these ratios operate somehow on different areas. Solvency depends on the value of cash flow, which in turn, is approximately net profit increased by depreciation (Nowak, 2005, p. 131). Both figures then depend directly on the same factor which is only differently expressed, and in this situation analyzing the relation between two financial categories is pointless. The solvency measures,

just like profitability, depend simply on achieved profits. Solvency ratios are not suitable for examining financial liquidity and its current management, but because of the differences in expressing solvency and profitability, these figures should not be confronted with each other.

The choice of variables for the model

Classical financial liquidity ratios have some disadvantages eliminated by the CCC ratio and vice versa. CR, QR and AT, as classical ratios, only show the potential to maintain financial liquidity, that is its level reflecting the coverage of current liabilities in appropriate current assets. The CCC ratio shows the time structure of financial liquidity, indicating the difference in time between cashing the receivables and the necessity to pay current liabilities. Separately they may provide faulty (because incomplete) information on financial liquidity and they supplement each other. That is why they should be used jointly (Kamach, 1989). Therefore, in the context of examining the influence of financial liquidity on company profitability, we took into account one of the classical ratios of financial liquidity, and a cash conversion cycle ratio. The QR ratio takes into account short-term investment and receivables, that is only financial assets, and financial assets are the highest liquidity assets. Therefore the QR ratio, as the 'acid test' of financial liquidity, is the best suited to represent the resource potential of maintaining financial liquidity.

Construction of the multi-factor regression model of profitability

To examine the influence of financial liquidity on profitability we chose ROA profitability ratio and QR and CCC financial liquidity ratios. Determination of the influence of financial liquidity on profitability on the basis of multi-factor econometric model seems the most appropriate research method, as it allows us to assess partial influence of financial liquidity on profitability in a situation when many factors simultaneously affect it. A proper choice of these factors is of key importance in creating a model that will well describe this phenomenon.

The enterprise profitability is influenced by a series of factors, both dependent and independent of it. They can be defined as internal and external factors.

Internal factors, those that depend on the enterprise, can be limited to its resources, structures of those resource and capital financing them, as well as working capital management (Samiloglu and Demirgunes, 2008). The resources, or company assets, its structure and the structure of its financing sources, are relatively stable, as they refer to the long-term activities of the enterprise. On the other hand, working capital management refers to short-term assets and liabilities and reflects the short-term activities of the enterprise.

External factors, independent of the enterprise, are all phenomena which affect company profitability and which are beyond the enterprise's control. Due to their great variety, they determine the uncertainty in shaping profitability. External factors comprise everything which is not the result of the decisions made by company managers, therefore it seems pointless to distinguish particular independent factors.

In line with the above premises, in the multi-factor regression model of profitability, QR and CCC ratios should be supplemented with other factors influencing profitability. The collection of all variables of the model, namely explained variable ROA and explanatory variables which create the model, is shown in Table 1.

Table 1: Variables of the multi-factor regression model of profitability

Variable	Symbol
Assets profitability	ROA
Size of the enterprise	Siz
Assets structure	A (CA/TA)
Capital structure	CS (D/E)
Level of financial liquidity	QR
Receivables conversion cycle	ARC
Inventories conversion cycle	ICC
Cash conversion cycle (time structure of financial liquidity)	CCC
Growth of sales (change of sales)	dS
Economic growth (economic situation)	dGDP

Source: Own elaboration

After taking into account all variables, the econometric model estimating profitability in which some explanatory variables are those concerning financial liquidity, takes on the following form:

$$ROA^* = a_1Siz + a_2As + a_3sCS + a_4QR + a_5ARC + a_6ICC + a_7CC + a_8dS + a_9dGDP$$

where:

ROA* – ROA value estimated by the model

a_1 - a_9 – parameters of the model

D – debt

The model is linear, and the only non-linear but linearized variable is Siz, calculated as a natural logarithm from assets, as we can observe in similar research (Samiloglu and Demirgunes, 2008). Moreover, the model does not contain the free term, as it would mean profitability at zero value of all explanatory variables, which is practically impossible. Variables A, CS and QR assuming value zero, would indicate in a theoretically possible case, impossible structure of assets and/or liabilities, but they would also mean lack of resources, without which no economic activity is possible. The assumption of zero value of all independent variables together is then unacceptable.

Statistical data

I conduct the examination of the financial liquidity analysis on profitability on construction sector companies listed in the index of the Warsaw Stock Exchange. The data used in the analysis refer to quarter periods in 2000-2010 – the examination comprises 44 observations. Each observation of each model variable constitutes weighted average of these variables for particular companies covered by the survey in a given period (quarter). Financial reports of the companies, as well as some ready, calculated ratios come from NOTORIA (www.notoria.pl) service. Data concerning GDP was obtained from the statistics of the Central Statistical Office (www.stat.gov.pl).

Quarter measures may be subject to seasonal and tax fluctuations. This is caused mainly by the seasonal variation of flow values, as the volume of resources does not change much and maintains relatively stable level, regardless of whether we take into account a period of one year or one quarter. In order to eliminate these fluctuations, the variables we use in calculations of flow values, are calculated in such a way that brings them close to more stable annual data. In this

method we treat flow values (net profit, revenues from sales) as the sum of four consecutive quarters, from the present quarter backwards. Resource values being possibly in relation with them are then calculated as the average for the same quarters. The variables calculated in this way are: ROA, ARC, ICC, CCC and dS. The variables consisting of the relation between two resource variables, such as Siz, A and CS are calculated in a standard way, taking into account only data from one quarter. The GDP value is calculated in relation to the corresponding quarter of the previous year, assuming the GDP value in that quarter at the level of 100.

Results and verification of the model

The results of the estimation of model parameters using the classic method of least squares were presented in Table 2.

Table 2: Results of the estimation of model parameters

Variable	coefficient	Standard error	t-Student	value p	
Siz	0.0495719	0.0122058	4.0613	0.00026	***
A	-0.829997	0.172797	-4.8033	0.00003	***
CS	-0.692103	0.204087	-3.3912	0.00174	***
QR	-0.103647	0.0416115	-2.4908	0.01764	**
ARC	-0.00131878	0.000354264	-3.7226	0.00069	***
ICC	0.000706998	0.00121682	0.5810	0.56495	
CCC	-0.00104166	0.000783522	-1.3295	0.19230	
dS	0.0935721	0.0905442	1.0334	0.30849	
dGDP	0.00362927	0.00156481	2.3193	0.02634	**

Source: Own elaboration on the basis of GRETL program calculations

The number of asterisks shows the significance of a parameter at a particular level of significance – 3 asterisks mean the 0.01 level of significance, 2 – 0.05. The more significant the parameter on a lower level of significance, the more we can observe real influence of the explanatory variable on profitability.

The R² coefficient of determination and remainder variation coefficient, describing the above premises were presented in Table 3.

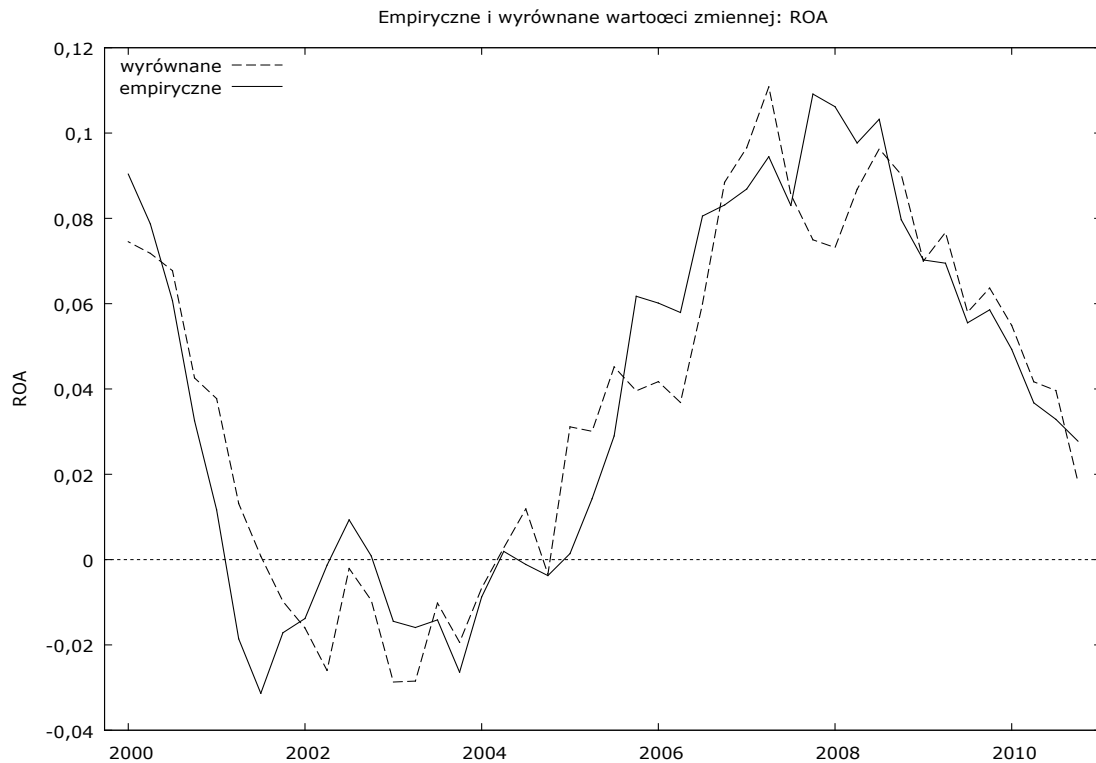
Table 3: Coefficient of determination and coefficient of residual variation

Coefficient of determination R ²	0.92
Coefficient of residual variation	0.39

Source: Own elaboration on the basis of GRETL program calculations

The model describes the variation of profitability in 92% (0.92). The way the variation of theoretical values (estimated by the model) and empirical profitability is shaped in time is shown in Figure 2. In the context of our examination, this is the most important statistical criterion of the model, as the high level of the coefficient of determination allows us to state, with considerable certainty, the possible direction of the relation between the explained variable and explanatory variables. As the model explains in 92% the direction in which profitability is shaped, this indicates a high degree of its suitability.

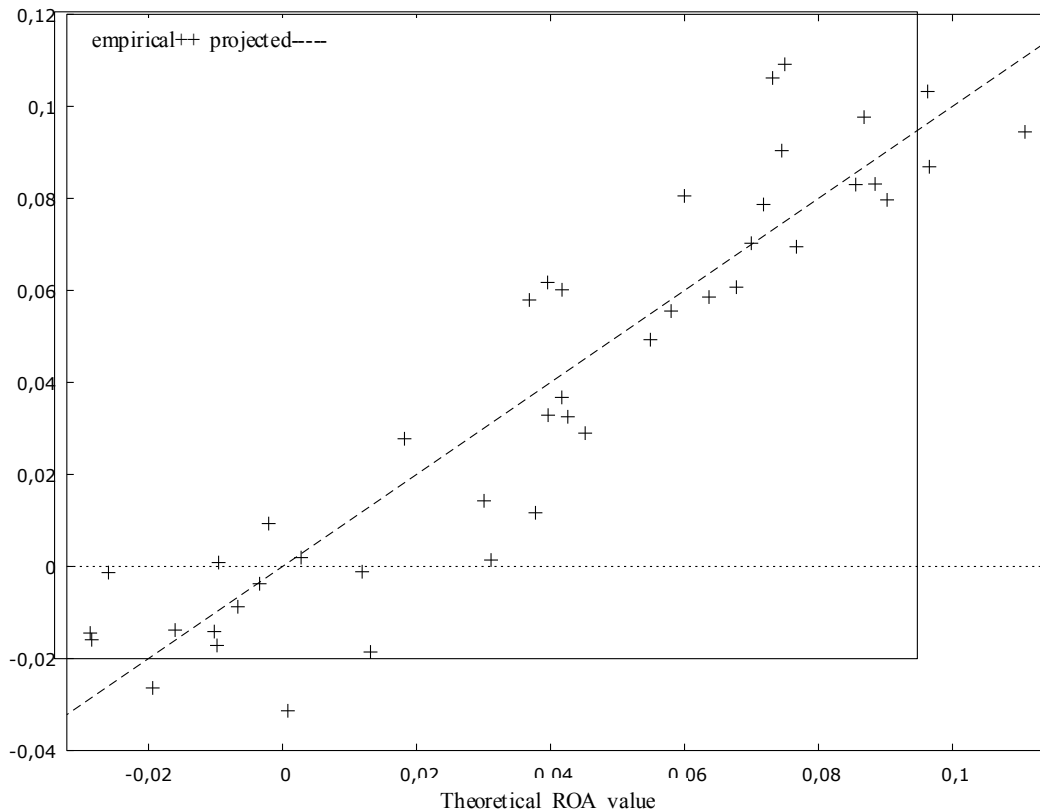
Figure 2: Trends of theoretical (adjusted) and empirical ROA



Source: The graph generated by the GRETL program

The random variation coefficient is calculated on the basis of the modules from ROA value, so as not to inflate it with low average mean of ROA caused by many positive and negative values. The coefficient value at the level of 0.39 means that the value of profitability is in 39% shaped by random factors. In other words, this model shapes the value of profitability by explanatory variables in 61%. In this area, the model adjustment is not very high, therefore when stating the power of influence of explanatory variables on profitability, we should remain skeptical. The adjustment of empirical values to values projected by the model is shown in Figure 3. We can observe there that real and empirical values are not very well adjusted, though the direction of their changes is the same.

Figure 3: Theoretical and empirical values of profitability measured by ROA



Source: The graph generated by the GRETL program

Summing up, the model allows us to determine the direction of the influence of explanatory variables on profitability, while it does not necessarily correctly reflect the power of this influence, as the value of profitability depends largely on random factors. The key issue in an appropriate model of the influence of financial liquidity on profitability is to check whether the parameters for explanatory variables make sense. As the examined variables are explanatory variables QR and CCC, the verification should cover only the variables which are controlling variables to them, as the model credibly explains the direction of profitability changes influenced by changes of explanatory variables.

Table 4: Direction of influence of variables on profitability

Variable	Coefficient	
Siz	+	***
A	-	***
CS	-	***
QR	-	**
ARC	-	***
ICC	+	
CCC	-	
dS	+	
dGDP	+	**

Source: Own elaboration on the basis of the calculations from the GRETL program

The parameter accompanying Siz implies that the growth of the company volume defined by possessed resources causes growth of profitability. It is probable, taking into account the increasing economies of scale. A large enterprise, increasing its assets, which is largely connected with increasing working supplies, may receive additional discounts for further deliveries. Lowering costs of operations may result in greater profitability.

The parameter accompanying A means that the growth of fixed assets share in total assets leads to decrease of profitability. It seems that current assets contribute to profitability more, as the basis of each enterprise is its core operational activity. Fixed assets, mostly through tangible fixed assets, generate most fixed costs. With the growth of current assets associated with variable costs, total unit costs decrease, which causes the increase of profitability. Parameters accompanying Siz and A , suggesting profitability growth with the growth of current assets are complementary. The sign of the A parameter may be considered correct.

The parameter accompanying CS implies that the growth of loan causes the decline in productivity. This situation may be caused by financial leverage. The leverage effect increases absolute profits, however, due to the interest rates of loans which increase costs, profitability decreases (though the profitability of own equity may grow). The parameter sign may be considered correct.

The parameter accompanying ARC means that the lengthening of the receivables conversion cycle causes the growth of profitability. This situation is in line with aggressive strategy of working capital management, contributing to increased profitability. One of the elements of this strategy is liberal policy of open account, aiming at increasing receivables which later translate into higher revenues, at the cost of lengthening the time of crediting customers. The effect of this activity is manifested in increased profitability. The parameter accompanying ARC may be considered correct.

The parameter accompanying ICC means that lengthening the inventory conversion cycle increases profitability. A longer time of inventory conversion may mean increased quality of finished products. In case of construction companies it may also mean more complicated and demanding commission. Such situations may increase revenues and be reflected in increased profitability. The parameter accompanying ICC may be considered correct.

The parameter accompanying dS means that increased revenue from sales is reflected in increased profitability. The growth of revenues from sales may account for the growth of market share, which is related to increased possibilities of raising prices at unchanged costs and greater possibilities of negotiating costs with suppliers. The dS variable is related to Siz variable, as far as economies of scale are concerned. The parameter accompanying the dS variable may be assumed correct.

The parameter going with $dGDP$ implies that economic growth leads to increased profitability. Economic growth in fixed prices may mean technological progress, which creates possibilities of creating the same volume of goods at lower costs. If technological progress concerns construction companies as well, they can increase their productivity. The parameter accompanying $dGDP$ may be assumed correct.

None of the parameters going with controlling variables raises serious objections. Therefore the result of the verification of the model may be considered a positive one.

Conclusions

After the verification of the model and control variables we should draw some conclusions concerning the influence of financial liquidity on profitability. The results of the estimation of parameters related to QR and CCC ratios are presented in Table 4 below.

Table 4: Parameters of QR and CCC ratios

Variable	Coefficient	Standard error	t-Student	Value p	
QR	-0.103647	0.0416115	-2.4908	0.01764	**
CCC	-0.00104166	0.000783522	-1.3295	0.19230	

Source: Own elaboration on the basis of calculation from the GRETL program

The only statistically significant variable representing financial liquidity is the QR ratio – the probability of its influence on ROA ratio equals 98.24%. Because at such level of probability the examined relation is considered regularity, the hypothesis referring to the existence of the influence of the level of financial liquidity determined by the resource of current assets on profitability, as well as the direction of this influence, are considered proved. As the model is not accurate as far as estimation of the profitability value is concerned, we cannot determine the power of this influence.

The growth of the relation between the state of receivables and short-term investment covering cash for current liabilities through the growth of the state of receivables and short-term investment and/or decline of the state of current liabilities causes decline of assets profitability, while the decline of the relation between the state of receivables and short-term investment through the decline of the state of receivables and short-term investment and/or the growth of the state of current liabilities causes the decline of assets profitability in construction companies. This is in line with the generally accepted theory of the influence of the level of financial liquidity on company profitability. It is worth pointing out that the level of QR ratio does not fall below 1 and its average value equals 1.31, so we can assume that the II degree financial liquidity of construction companies in Poland oscillates within its optimum level. We can also state that the level of financial liquidity determined by short-term receivables and investment negatively influences the profitability of construction companies within its optimum level.

The phenomenon is considered to exist when its actual probability equals at least 90% (the significance level of 0.1). The probability that the CCC ratio influences ROA ratio equals 80.77%. Therefore we must reject the hypothesis of the influence of time structure of financial liquidity on company profitability. However, we should pay attention to the fact that the significance level at which the hypotheses are accepted or rejected is an arbitrary issue. If we treat this analysis as aiming only at providing construction company managers with practical suggestions, we can assume that it is highly probable that the cash conversion cycle influences profitability. Moreover, the possible direction of this influence is in line with the hypothesis which says that lengthening the cash conversion cycle will negatively influence profitability.

Financial liquidity influences profitability of construction companies listed on the Warsaw Stock Exchange. The more liquid company considering the static ratios as QR to more capital is required to finance this liquidity. If there is cash safety-stocks provided by company over the average in a sector level the lower the profitability will be. The same way of influence will be noticed when considering account receivables. They partially will be financed by payables but the rest of this category will have to be financed both by short-term liabilities or long term-capital if working capital is considered. The significant influence of liquidity on profitability suggests managers to focus on more aggressive working capital management to decrease liquidity to the optimal level if it is too high, while representing the conservative policy. If managers will consider CCC as the important ratio and will use it for decision making it will improve the profitability – liquidity relation even better.

References

- Brigham, E. F., Gapenski, L. C. (2000). *Zarządzanie finansami*. Vol. 2. Warszawa: Polskie Wydawnictwo Ekonomiczne.
- Cicirko, T. (2010). *Podstawy zarządzania płynnością finansową przedsiębiorstwa*. Warszawa: Oficyna Wydawnicza Szkoła Główna Handlowa.
- Czekaj, J., Dresler, Z. (2001). *Zarządzanie Finansami Przedsiębiorstw*. Warszawa: Wydawnictwo Naukowe PWN.
- Gajdka, J., Walińska, E. (2008). *Zarządzanie finansowe. Teoria i praktyka*. Vol. 1 and 2. Warszawa: Fundacja Rozwoju Rachunkowości w Polsce. I edition.
- Hager, H. C. (1976). Cash Management and Cash Cycle. *Management Accounting*. March, p. 19-21.
- Kamach, R. (1989). How Useful Are Common Liquidity Measures? *Journal of Cash Management*. January/February 1989, p. 24-28.
- Kusak, A. (2006). *Płynność finansowa analiza i sterowanie*. Warszawa: Wydawnictwo Naukowe Wydziału Zarządzania Uniwersytetu Warszawskiego.
- Nowak, E. (1996). *Leksykon Rachunkowości*. Warszawa: Wydawnictwo Naukowe PWN.
- Nowak, E. (2005). *Analiza sprawozdań finansowych*. Warszawa: Polskie Wydawnictwo Ekonomiczne.
- Richards, V. D., Laughlin, E. J. (1980). A Cash Conversion Cycle Approach to Liquidity Analysis, *Financial Management*, p. 32-38.
- Samiloglu, F., Demirgunes, K. (2008). The Effect on Working Capital Management on Firm Profitability: Evidence from Turkey, *The International Journal of Applied Economics and Finance*, 2 (1).
- Sierpińska, M., Wędzki, D. (1997). *Zarządzanie płynnością finansową w przedsiębiorstwie*. Warszawa: Wydawnictwo Naukowe PWN.
- Szczepaniak, P. (1996). Relacje między płynnością a rentownością finansową, *Finanse i Bankowość*, No 3.
- Wędzki, D. (2003). *Strategie płynności finansowej przedsiębiorstwa: przepływy pieniężne a wartość dla właścicieli*. Kraków: Oficyna Ekonomiczna.
- Wojciechowska, U. (2001). *Płynność finansowa polskich przedsiębiorstw w okresie transformacji gospodarki aspekty makroekonomiczne i mikroekonomiczne*. Warszawa: Oficyna Wydawnicza Szkoły Głównej Handlowej.