# Barriers to liquidity of small industrial enterprises in Poland – model approach

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**Abstract**

The aim of the study is to identify and evaluate factors that are barriers to liquidity of small industrial enterprises in Poland. This problem has been repeatedly undertaken in research [C.S. Kim, D. C. Mauer, A. E. Sherman 1998, M. Sierpińska, D. Wędzki 2008]. A model approach presented in the paper differs from those presented in the literature, since it is based on subjective opinions of small industrial enterprises' managers, which concerned the barriers to the ability of entities to fund their liabilities.

**Key words**

Liquidity, barriers, small industrial enterprises, model approach.

**JEL Classification:** G31, C20

## 1. Introduction

Liquidity in corporate finance represents the ability to meet financial commitments such as paying creditors and paying off loans on time. It is an important component of working capital management. Researchers have proved that the management of liquidity is usually more important than decisions about capital structure, concerning the enterprise's ability to function on the market.[2] The consequences of becoming illiquid can be bankruptcy or insolvency. So, it is very important to evaluate liquidity[3], using many measures in assessing companies' likelihood of failure and credit worthiness[4]. The business may become insufficiently profitable to generate adequate cash flows. In economics, liquidity means that an asset can be turned into cash quickly and without loss in other words whether it can be easily traded[5]. Many firms, particularly SMEs, hold cash as a buffer[6].

Industry small enterprises are a special group of entities. Firm size may partially determine the overall financial health of a company as well the company's basic financial characteristics. Furthermore, in industry companies fixed assets are a large proportion of total assets. It requires long-term or permanent financing. This brings into focus the fact, that small business should be concerned with working capital because of traditionally, small businesses have difficulty in obtaining long-term financing, so liquidity position of these entities is significant. Liquidity is a fundamental assumption of developing enterprise. The lack of adequate financing becomes a big problem in periods of growth[7]. Undercapitalization can leads to

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failure, reduces growth or becomes worse with rapid growth. Welsh and White (1981) maintain that sufficient liquidity is basic to survival for small firms. They point out that many business failures occur in a year with record sales, largely because of inadequate financing. This research focuses on the barriers for the liquidity of small industry enterprises. This problem has been repeatedly undertaken in research [C.S. Kim, D. C. Mauer, A. E. Sherman 1998, M. Sierpińska, D. Wędzki 2008]. A model approach presented in the paper differs from those presented in the literature, since it is based on subjective opinions of small industrial enetrprises managers, which concerned the barriers to the ability of entities to fund their liabilities.

## 2. Research objectives and source of data

Liquidity is a matter of enterprises' policy and it is determined by many factors. The questions that this paper sets out to answer is: which factors are the barriers for small industry enterprises' liquidity? The subjective data referring to the ability of small enterprises in Poland to settle current liabilities and to their financial situation comes from the *Badanie Koniunktury Gospodarczej [Study of Business Tendencies]* conducted by the Central Statistical Office (GUS).

The study of business tendencies in industry encompasses entities performing business activity in the processing industry classified in the Polish Classification of Activities (PKD 2007) in section C[8]. The observed enterprises employed 10 and more people and were divided into the following size classes: small, medium and big. The sample (3500 enterprises) is comprised of the whole group of big units and 10% of subjects from the small and medium group. The units are selected by the stratified sampling method, without replacement, proportionally, but there is an attempt to include in the sample all units which regularly partake in the study. The stratum is defined in terms of both the PKD section/division/class and the size class. The study does not include micro enterprises (up to 9 employed) due to the fact that they do not have a significant influence on business tendencies in the processing industry as a whole, generating less than 7% of revenues of the whole studied population. The study is conducted at a monthly frequency. In addition, follow-up data to the information gained on a monthly basis is gathered once a quarter, while data about investment activities of industrial enterprises is collected twice a year. Every month each of the selected subjects is obliged to answer opinion questions about the chosen factors affecting the present and future (in a three-month perspective) situation of the enterprise. The survey has two parts –

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[8] The study of the business cycles tendencies has a qualitative nature and refers to the subjective evaluations of the management of industry enterprises. A typical question is formed in such a manner that a respondent has to indicate weather his/her situation in a particular respect improved, did not change or deteriorated in comparison with the subsequent period. The data is aggregated separately for each question, and the stages of this process provide data for the sections adopted in the study assumptions. In the case of a qualitative single choice question with three options, the first stage of the calculation consists in adding up the number of answers for each option – positive (situation improved), neutral (situation did not change) and negative (situation deteriorated) given by the subjects comprising a particular stratum (e.g. small enterprises manufacturing food products). The next stage consists in calculating the breakdown of the three responses, which add up to 100% (e.g. 50% positive responses, 30% neutral, 20% negative). This breakdown is the so-called business cycle tendency mirror. The simple business cycle tendency indicator for this type of question is calculated as the difference between the percentage of positive and negative responses, which creates the so-called balance of answers for a given question. It means that the balance of answers does not include the middle answer, i.e. the neutral answer[8].

diagnostic and prognostic[9]. Due to data availability, 42 quarterly observations (from the diagnostic part) of small enterprises from the first quarter 2003 to the second quarter 2013 were used in the study.

## 3. The Models and Variables

Linear econometric model was used to evaluate the liquidity of the small industrial enterprises:

$$Liquidity_t = c + \beta \mathbf{x}_t + \varepsilon_t,$$

where the *Liquidity* is the dependent variable of the model. It results from averaging entrepreneurs' subjective responses to the question about "the ability to settle financial liabilities when due". Vector $\mathbf{x}$ is the vector of the independent variables described in Table 1, $\beta$ is the vector of the variables' coefficients.

*Table 1. Variables influencing the ability to settle liabilities when due in the opinion of the management of small industrial enterprises*

| Variable | Variable description |
|---|---|
| *InsuffDem* | Insufficient demand in the domestic market. |
| *InsuffDemFor* | Insufficient demand in the foreign market. |
| *ShortSkillLab* | Shortage of skilled labour. |
| *ShortMaterials* | Shortage of raw materials, materials and semi-finished products (not related to financial causes). |
| *ShortEquipm* | Lack of appropriate equipment. |
| *HighBudget* | High payments to state revenue. |
| *CompImport* | Competitive imports. |
| *UnclearRegul* | Unclear and inconsistent legal regulations. |
| *UncertEcEnvir* | Uncertainty of the general economic environment. |
| *Other* | Other barriers. |

*Source: own work.*

Table 2 presents descriptive statistics of the variables.

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[9] The diagnostic part includes questions concerning the evaluation of: the general economic situation of an enterprise, order portfolio including foreign orders, present production and in the past three months, level of stock of finished products, total financial situation, including financial liabilities, receivables and delayed payments. The prognostic part includes questions about predictions for the nearest months about:  the general economic situation of an enterprise, order portfolio, including foreign orders, production, selling prices, employment, total financial situation, including financial liabilities. Questions in the quarterly survey concern the evaluation of: order portfolio in the past three months, an enterprise's manufacturing capacity, enterprise's manufacturing capacity utilization ratio, guaranteed period of production, barriers hindering economic activity, the position of the enterprise in comparison to the competitors in the domestic market, in the EU member states' markets and outside the EU.

*Table 2. Descriptive statistics of the variables adopted in the model of liquidity barriers to small industrial enterprises*

| Variable | Mean | Median | Maximum | Minimum | Std. Dev. |
|---|---|---|---|---|---|
| *SytFin* | -16.93 | -16.15 | -2.3 | -34.6 | 7.24 |
| *InsuffDem* | 59.67 | 60.7 | 77.3 | 40.6 | 8.99 |
| *InsuffDemFor* | 21.94 | 21.65 | 29.2 | 13.4 | 4.03 |
| *ShortSkillLab* | 15.96 | 14.25 | 31.0 | 7.9 | 5.78 |
| *ShortMaterials* | 5.06 | 4.8 | 8.0 | 2.0 | 1.64 |
| *ShortEquipm* | 9.90 | 9.8 | 16.2 | 5.0 | 2.10 |
| *HighBudget* | 59.25 | 61.3 | 74.7 | 46.0 | 8.89 |
| *CompImport* | 19.40 | 19.45 | 24.4 | 15.4 | 1.97 |
| *UnclearRegul* | 36.50 | 36.75 | 48.4 | 26.3 | 6.28 |
| *UncertEcEnvir* | 53.60 | 53.5 | 68.9 | 35.0 | 8.70 |
| *Other* | 6.10 | 5.9 | 10.1 | 2.7 | 1.65 |

*Source: own work.*

There is high correlation, both positive and negative, between some variables representing barriers to the enterprise's liquidity. Highest positive correlation coeficients are between *HighBudget* and *UnclearRegul* (0.939) and between *InsuffDem* and *UncertEcEnvir* (0.862), while highest negative – between *InsuffDem* and *ShortSkillLab* (-0,901). 22 out of 45 pairs of variables have significant coefficient of correlation at 5% significance level. 12 of thoose significant coefficients are negative.

Three variables, *InsuffDem*, *InsuffDemFor* and *UncertEcEnvir* have significant negative coefficients of correlation with *Liquidity*, while two variables, *ShortSkillLab* and *ShortMaterials* have significant positive coefficients of correlation with *Liquidity*.

## 4. Results and Discussion

Owing to the type of their operating activities, industrial enterprises are characterised by a higher percentage of fixed assets than current assets in the assets structure. In the structure of equity and liabilities, the share of equity is higher than liabilities. Liabilities structure shows higher value of long-term liabilities than short-term financing. It stems, above all, from the necessity to incur specific capital expenditure (higher than in other PKD sections). Additionally, it ought to be underscored that for security reasons manufacturing enterprises have to ensure more long-term financing than trade enterprises due to longer cash conversion[10].

Table 3 presents parameters' estimation results of the initial model of liquidity barriers to small industrial enterprises.

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[10] Janeta A., (2009).

*Table 3. Parameters' estimation results of the initial model of liquidity barriers to small industrial enterprises*

| Variable | Coefficient | Standard Error | t-Statistic | Probability |
|---|---|---|---|---|
| *InsuffDem* | -0.6604 | 0.3267 | -2.0214 | 0.0519 |
| *InsuffDemFor* | -0.8344 | 0.6213 | -1.3431 | 0.1890 |
| *ShortSkillLab* | -1.0220 | 0.3258 | -3.1364 | 0.0037 |
| *ShortMaterials* | 0.0165 | 0.6813 | 0.0242 | 0.9809 |
| *ShortEquipm* | -0.7393 | 0.4924 | -1.5016 | 0.1433 |
| *HighBudget* | 0.8068 | 0.3355 | 2.4045 | 0.0224 |
| *CompImport* | -0.6143 | 0.6088 | -1.0091 | 0.3207 |
| *UnclearRegul* | -0.9207 | 0.3753 | -2.4530 | 0.0200 |
| *UncertEcEnvir* | -0.2192 | 0.2243 | -0.9772 | 0.3360 |
| *Other* | 0.0922 | 0.6931 | 0.1330 | 0.8950 |
| *C* | 73.2314 | 25.2244 | 2.9032 | 0.0067 |
| | | | | |
| $R^2$ | 0.7189 | | F-statistic | 7.9296 |
| Adjusted $R^2$ | 0.6283 | | Prob (F-statistic) | 0.0000 |
| DW Statistic | 2.1070 | | | |

*Source: own work.*

Next, optimal set of regressors was determined using adjusted coefficient of determination $\overline{R^2}$ as criterion.[11] For this purpose, regressors with smallest value of absolute value of the t-ratio were consequently eliminated until all t-ratios became greater than 1 in absolute value. The result is presented in the Table 4.

*Table 4. Parameters' estimation results of the final model of liquidity barriers to small industrial enterprises*

| Variable | Coefficient | Standard Error | t-Statistic | Probability |
|---|---|---|---|---|
| *InsuffDem* | -0.6713 | 0.2971 | -2.2594 | 0.0306 |
| *InsuffDemFor* | -0.8080 | 0.4967 | -1.6268 | 0.1133 |
| *ShortSkillLab* | -1.0290 | 0.3117 | -3.3014 | 0.0023 |
| *ShortEquipm* | -0.7313 | 0.4653 | -1.5715 | 0.1256 |
| *HighBudget* | 0.8007 | 0.3082 | 2.5981 | 0.0139 |
| *CompImport* | -0.5840 | 0.5245 | -1.1135 | 0.2736 |
| *UnclearRegul* | -0.9121 | 0.3583 | -2.5460 | 0.0158 |
| *UncertEcEnvir* | -0.2312 | 0.1906 | -1.2126 | 0.2339 |
| *C* | 74.0818 | 17.7263 | 4.1792 | 0.0002 |
| | | | | |
| $R^2$ | 0.7188 | | F-statistic | 10.5430 |
| Adjusted $R^2$ | 0.6506 | | Prob (F-statistic) | 0.0000 |
| DW Statistic | 2.0956 | | | |

*Source: own work.*

The estimation of the model of liquidity barriers to small industrial enterprises confirmed the statistical significance of four variables (at 10% level of significance). They are respectively: insufficient demand in the domestic market (*InsuffDem*), shortage of skilled labour (*ShortSkillLab*), high budgetary burdens (*HighBudget*) and unclear and inconsistent

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[11] Greene W.H., (2000), p.306.

legal regulations (*UnclearRegul*). The influence of the variable *HighBudget* is positive. The tested model is statisticaly significant at 1% level (the value of F-statistic of 10.5430). The model describes about 72% of the total variation of the studied phenomenon. Durbin-Watson statistic lies in the inconclusive range[12], but it is much closer to its higher limit, which justifies with substantial reliability the application of the least squares method to estimate the model.

## 5. Conclusion

The research presented in the paper allowed the identification of economic barriers to the liquidity of small industrial enterprises in Poland. The data was provided by *Badanie koniunktury gospodarczej [Study of Business Tendencies]* conducted by the *Central Statistical Office (GUS)*. The evaluation of the identified barriers to liquidity was performed by means of statistical tools. The conducted studies allowed to formulate the following general conclusions:

1. As the liquidity barriers for small industrial enterprises should be treated those of statistically significant variables that have negative impact on the liquidity: insufficient demand in the domestic market (*InsuffDem*), shortage of skilled labour (*ShortSkillLab*) and unclear and inconsistent legal regulations (*UnclearRegul*).
2. Insufficient demand in the domestic market is a barrier to obtaining revenues supported by positive cash flows. Uncertainty is increased by the unclear and inconsistent legal regulations. The companies' liquidity is reduced also by the underinvestment on human resources (shortage of skilled labor).
3. Perception of high payments to state revenue as a barrier is concomitant with the improvement of the enterprises' liquidity.

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[12] The inconclusive range occurs when the test $d_l \leq DW \leq d_u$ or $4 - d_u \leq DW \leq 4 - d_l$ gives no answer as to the existence of autocorrelation. The critical values of Durbin-Watson's test are accepted: lower $d_l$ and upper $d_u$ of the distribution depending on the number of estimated parameters ($k$+1) and the size of the sample $T$. The critical values of Durbin – Watson's test for 42 observations and 8 explanatory variables amount to respectively $d_L$=1.096, $d_U$=1.980. In: Savin N.E. and White K.J. (1977).

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