Proceedings of 2013 International Conference on
Technology Innovation and Industrial Management
29-31 May 2013, Phuket, Thailand

THREAT OF INSOLVENCY OF PRIVATE SECTOR COMPANIES ON THE EXAMPLE OF POLAND, CZECH REPUBLIC AND SLOVAKIA

Dr hab. Justyna Franc-Dąbrowska, Warsaw University of Life Science
Email: justyna_franc_dabrowska@sggw.pl

Dr Małgorzata Porada-Rochoń, University of Szczecin
Email: malgorzata.rochon@wp.pl

ABSTRACT

Introduction: *Changeability of environment causes that companies are more often vulnerable to functioning in a crisis. Managers around the world identify liquidity management as the primary driver of their decisions. In the turbulent environment in times of financial crisis, liquidity becomes more difficult but also more important. Especially since the crisis leads to erosion of liquidity and even insolvency. Many researches examine the phenomenon of the lack of liquidity taking into consideration different perspective. Therefore, it is important to study the phenomenon of insolvency, determinants that shape it as well as seek opportunities to reduce the risk of this problem.*

Research methodology: *The aim of the study was to identify the determinants that affect the risk of insolvency of companies in Poland, Czech Republic and Slovakia in the conditions of instability of the economies in these countries. Panel data analysis was carried out – panels balanced in 2006-2010. The study involved 256 companies from Poland, 388 from Czech Republic and 187 from Slovakia. In the first stage of the research panel model was developed for Poland using fixed-effects panel analysis. Fixed-effects panel analysis in the following form was used:*

$$y_{it} = x_{it}\beta + u_i + \varepsilon_{it}$$

where u_i *- individual effect,*

ε_{it} *- pure random error.*

In the fixed-effects panel model fixed individual effects are eliminated by averaging the model against time (t_{index}*). Explanatory variable was shareholders funds, among the variables under consideration were 15 variables (metrics and financial ratios), which underwent initial substantive and statistical verification. The starting point of the analysis were shareholders funds, because under conditions of financial instability, there are shareholders funds that protect businesses against the risk of insolvency. In the second stage of the study variables specific for Polish companies were analyzed and compared with data from Czech and Slovak companies, using non-parametric Kolmogorov-Smirnov tests. An interesting research problem is the fact whether the companies in Central Europe show similarities in the variables that determine the level of shareholders funds and if the same actions (or*

similar) preventing the threat of insolvency can be recommended to companies from different countries.

The results of literature research: *The identified factors can be divided into two groups: variables having nature of assets/equity and cost related variables. The results of the model allowed to confirm statements known from finance literature that an important factor in supporting the operation of enterprises in a long time are loans and they do not necessarily have to be criticized (especially in terms of the costs associated with the use of this source of capital). Long-term loans may in fact be the one factor that not only allows the company to continue, but also allows the development to a greater extent than it would be possible only on the basis of equity. The variable that assists in this process are tangible fixed assets, which also positively influence the level of shareholders funds and therefore protect Polish companies against the threat of becoming insolvent.*

Variables negatively affecting levels of shareholders funds in Polish enterprises in 2006-2010 were material costs and depreciation. From the point of view of the stability of the financial situation of enterprises and opportunities to reduce the risk of insolvency these two variables should be particularly closely monitored by management. It has its source among others in overinvesting in some of Polish companies and limited possibilities of full capacity utilization during stagnation of the economy.

The model was subject to substantive and formal verification and it was found it was valid. In the second stage of the research a comparative analysis of businesses in Poland Czech Republic and Slovakia will be carried out, conclusions will be drawn regarding the companies analyzed in these three countries, as well as the findings of the research will be formulated. The paper will also include recommendations for entrepreneurs in Poland, Czech Republic and Slovakia.

INTRODUCTION

Changeability of environment causes that companies are more often vulnerable to functioning in a crisis. Managers around the world identify liquidity management as the primary driver of their decisions. In the turbulent environment in times of financial crisis, liquidity management becomes more difficult but also more important. Especially since the crisis leads to erosion of liquidity and even insolvency. Many researches examine the phenomenon of the lack of liquidity taking into consideration different perspective. Therefore, it is important to study the phenomenon of insolvency, determinants that shape it as well as seek opportunities to reduce the risk of this problem.

Since 2007, in economic literature on finance, significant attention has been paid to the changes and effects of the macroeconomic environment on business failure and company insolvency. Indeed, in times of crisis, the number of unsuccessful companies is higher, than in times of economic prosperity.

The crisis from 2007-2008 affected mostly micro small and medium companies, which faced financial spiral downturn that often drove them to bankruptcy. Due to the fact, that current crisis increased number of bankruptcies and insolvencies[1], financial management is gaining importance in the context of preventing or diminishing its impact. Therefore, the study of determinants influencing this phenomenon is valuable. The more extensive analysis and knowledge of the determinants shaping insolvency, the more likely possibility of eliminating it, which also matters for the health of whole economy.

RESEARCH METHODOLOGY

The aim of the study was to identify the determinants that affect the risk of insolvency of companies in Poland, Czech Republic and Slovakia in the conditions of instability of the economies in these countries. Panel data analysis was carried out – panels balanced in 2006-2010. The study involved 256 (panel 1287) companies from Poland, 388 (panel 1940) from Czech Republic and 187 (panel 935) from Slovakia. In the first stage of the research panel model was developed for Poland using fixed-effects panel analysis. Fixed-effects panel analysis in the following form was used:

$$y_{it} = x_{it}\beta + u_i + \varepsilon_{it}$$

where y_{it} – endogenous variable,

x_{it} – exogenous variable (generally a vector of exogenous variables),

u_i – individual effect,

ε_{it} – pure random error (Kufel 2007).

In the fixed-effects panel model fixed individual effects are eliminated by averaging the model against time (t index). Explanatory variable was shareholders funds, among the variables under consideration were variables: metrics and financial ratios, which underwent initial substantive and statistical verification. In addition, variability in the data over time (dt_2-dt_5) has been also included. The starting point of the analysis were shareholders funds, because under conditions of financial instability, there are shareholders funds that protect businesses against the risk of insolvency. In the second stage of the study variables specific for Polish companies were analyzed and compared with data from Czech Republic and Slovak companies, using Kruskal-Wallis tests. An interesting research problem is the fact whether the companies in Central Europe show similarities in the variables that determine the level of shareholders funds and if the same actions (or similar) preventing the threat of insolvency can be recommended to companies from different countries.

Determinants of insolvency – literature review

Generally, solvency means ability to pay current debt. The ability to pay debt is conditioned by assets and capital structure. Leverage is defined as the sensitivity of the value of equity ownership with respect to changes in the underlying value of the firm. Leverage ratios are frequently independent variables. Leverage ratios are also the dependent variable in the empirical capital structure literature. This literature tries to explain variations in corporate

[1] Interesting results and the extent of phenomenon presents: BUSINESS DYNAMICS:START-UPS, BUSINESS TRANSFERS AND BANKRUPTCY 2011 published by European Commission.

leverage, both in the cross section of capital structure (i.e. why some companies have high leverage) and in the time series (how capital structures evolve). In the theory of capital structure, one common hypothesis derives directly from the equity-sensitivity channel: a company with more leverage has both higher powered incentives and (usually) a higher probability of financial distress (Welch 2011).

It should be taken into consideration, that, according to the tradeoff theory, the capital structure literature finds a negative relationship between profitability and leverage. Branch (2000) and Campbell and Frost (2007) argue that when a company is in financial distress, managers have a fiduciary duty to protect the rights of creditors as well as duties to shareholders. Therefore, in a financially distressed company, we assume that the payoff for the manager depends on both the value of equity and debt.

Also it is important to take into account the impact of financial flexibility on capital structure. The literature presents a vast array of research on insolvency, thus pointing to a number of different, sometimes conflicting factors that determine it.

According to assets liquidity in terms of distress companies, interesting findings are presented by Shleifer and Vishny (1992). They argue that when companies have trouble meeting debt payments and sell assets, the highest valuation potential buyers of these assets are likely to be other firms in the same industry. But with the possibility of a contagion effect, these firms themselves are likely to have trouble meeting their debt payments. Bhagat et al. (2005) considered decision of distress companies related to cash flow and financial results. They found negative investment-cash flow sensitivity for distressed firms with operating losses and a positive sensitivity for all other firms. At the same time, they document that the negative cash flow sensitivity is generated by distressed firms with operating losses that invest more than the previous years (in : Flagg, Kudrimoti, Margetis 2011). It means, that due to the trend toward declining cash flow, these companies make decisions to increase their investments (Flagg, Kudrimoti, Margetis 2011).

Researches carried by Altman (1984), Alderson and Betker (1995), Andrade and Kaplan (1998), Molina (2005), point out, that management of trade receivables, given its importance for firms' assets, has the potential to play important role when firms encounter financial problems (especially according to estimation of the costs of financial distress, in some cases explicitly recognizing the importance of the relations with clients for capital structure decisions and for the costs of financial distress (Titman 1984, Opler, Titman 1994). (Molina, Preve 2009).

Preve and Molina (Molina, Preve 2009) undertook the study to clarify the trade receivable policy, depending on the stage of financial distress proved. They document that, firms in financial distress tend to increase the use of trade receivables when they start facing profitability problems, usually in a prefinancial distress situation and provide fewer trade receivables to their clients when they face cash flow problems and enter full financial distress. According to financial condition of companies in financial distress, they investigated the effect of decrease in trade receivables. The results were consistent with those presented in the literature, but they add to this body of knowledge by demonstrating that the drop is significantly larger when there is a reduction in trade receivables (Molina, Preve 2009).

Long-term solvency is concerned with two important elements: capital structure and earning power. “Capital structure refers to the sources of financing for a company. Financing can range from relatively permanent equity capital to more risky or temporary short-term financing resources” (Wild et al. 2007 in Bardia 2012).

The issue of equity returns in terms of financial distress, as well as default probability is presented by Avramov et al. (2007). They indicate that profits of momentum strategies that buy “winners” and sell “losers” are remarkably concentrated among a small subset of firms with low credit ratings, which adds a new dimension to the complex relationship between financial distress and cross-sectional properties of equity returns. Thus, the hump-shaped relationship between expected returns and default probability is capable of simultaneously explaining two known empirical regularities: the inverse relationship between expected returns and default probability (Dichev (1998), Campbell et al. (2008), Garlappi et al. (2008), and George and Hwang (2010)), and the concentration of momentum profits in low credit quality stocks (Avramov et al. (2007)) (Chou at al 2010).

Adopting the general determinants influencing the threat of insolvency can be replaced (Damodaran 2009 and others):
1. **Stagnant or declining revenues**: one of the first sign of a company in decline is inability to increase revenues over extended periods, even if a company operates in normal economical circumstances . Flat revenues or revenues that grow at less than the inflation rate indicate operating weakness.
2. **Shrinking or negative margins**: together with stagnant revenues at declining firms shrinking operating margins can be also observed, which is partly due deteriorating pricing power and partly because they decrease prices to preserve revenues from further drop. Instead of getting better, their financial condition is worsening. This results together in deteriorating or negative operating income at these firms, with occasional increases in profits generated by asset sales or one-off profits.
3. **Asset divestitures**: the deterioration of the financial situation of the company, including in particular the lack of liquidity makes it necessary to raise extra cash. Assets divestiture can help companies to recover and improve (increase) the level of liquid assets). If a declining firm has significant debts, it will be more determined to sell assets to avoid default or to pay down debt.
4. **Big payouts** – dividends and stock buybacks: Firms with problems don’t have typically investments that generate value, existing assets that may can generate positive cashflows and disposal of assets that result in cash inflows. In financial distress, when there is lack of cash (also no positive financial results), sometimes companies instead of paying dividends, they prefer to offer stock.
5. **Financial leverage** – the more debt in financial structure, the higher risk of default. Having stagnant and falling earnings from existing assets and little potential for earnings growth, many declining firms face difficult debt burdens. Such situation creates a risk of gridlock payment, which entails increased distrust form stakeholders point of view. At the same time, capital providers at least demand more collateral, thereby creating even the ground for bankruptcy.

For above reasons, to explain the phenomenon of default in our study, we used an independent variable: equity. Our findings show, that there is an interesting combination of factors defining independent variable.

RESULTS OF EMPIRICAL RESEARCH

The identified factors can be divided into two groups: variables having nature of assets/equity and cost related variables. The results of the model allowed to confirm statements known from finance literature that an important factor in supporting the operation of enterprises in a long time are loans and they do not necessarily have to be criticized (especially in terms of the costs associated with the use of this source of capital). Long-term loans may in fact be the one factor that not only allows the company to continue, but also allows the development to a greater extent than it would be possible only on the basis of equity. The variable that assists in this process are tangible fixed assets, which also positively influence the level of shareholders funds and therefore protect Polish companies against the threat of becoming insolvent.

Variables negatively affecting levels of shareholders funds in Polish enterprises in 2006-2010 were material costs and depreciation. From the point of view of the stability of the financial situation of enterprises and opportunities to reduce the risk of insolvency these two variables should be particularly closely monitored by management. It has its source among others in overinvesting in some of Polish companies and limited possibilities of full capacity utilization during stagnation of the economy. In addition, it should be kept in mind that depreciation is one of those cost factors that in case of companies heavily equipped with fixed assets can greatly affect financial result, thus directly impacting level of retained earnings and thus equity. On the other hand, in innovative economy, it is spot-on investments may allow companies not only exist on the market in financial crisis or stagnation of the economy but may also help to achieve a competitive advantage and, therefore, growth. It is not recommended, therefore reducing the level of depreciation (e.g. at the expense of investments), but a critical analysis of the actual investment needs of enterprises. The situation is similar in case of the costs of raw materials for production. As an important component of costs they have clear influence on the reduction of the net financial result and, therefore, retained earnings (which in turn reduces the level of equity). On the other hand, the search for a niche market in the area of high (or so far offered) quality requires ensuring good quality (or so far offered) raw materials for production. It is recommended, therefore, a critical analysis of costs of raw materials and exploring the possibilities of reducing such by eliminating losses, negotiating prices and terms of delivery.

Table 1. Estimation results of the panel analysis – fixed-effects panel model, private sector companies of Poland

Model: Panel estimation – method fixed-effects panel model Dependent variable: log_ Shareholders funds thousand EUR Resistant standard errors (robust HAC)					
Variable	Coefficient	Standard error	*t*-Student	*p-value*	Significance
Const	-0,0929588	0,247154	-0,3761	0,71398	
l_Tangible_fixed_assets_th_EUR	0,07306	0,00726313	10,0590	<0,00001	***
l_Other_shareholders_funds_th_EUR	0,810503	0,012694	63,8492	<0,00001	***
l_Long_term_debt_th_EUR	-0,00137832	0,00859232	-0,1604	0,87546	
l_Creditors_th_EUR	0,0352723	0,0050946	6,9235	0,00003	***
l_Net_current_assets_th_EUR	0,0328687	0,00839009	3,9176	0,00240	***
l_Number_of_employees	-0,0971961	0,03957	-2,4563	0,03189	**
l_Full_financial_expense	0,0568231	0,0224946	2,5261	0,02817	**
l_Taxation_th_EUR	0,000613436	0,00322323	0,1903	0,85253	
l_Material_costs_th_EUR	-0,0486917	0,00697283	-6,9831	0,00002	***
l_Costs_of_employees_th_EUR	0,170911	0,0680679	2,5109	0,02894	**
l_Depreciation_th_EUR	0,108837	0,0174036	6,2537	0,00006	***
l_Interest_paid_th_EUR	-0,0597064	0,0155374	-3,8428	0,00273	***
dt_2	-0,0121127	0,0180436	-0,6713	0,51588	
dt_3	-0,0303302	0,0226282	-1,3404	0,20715	
dt_4	-0,056574	0,0287884	-1,9652	0,07515	*
dt_5	-0,0681735	0,0419602	-1,6247	0,13250	
Coefficient of determination R^2 = 0,999797					
Statistics F (58, 11) = 932,6853, p-value < 2,83e-15					
Doornik-Hansen test Chi-square 6,39714, p-value = 0,0408205					

* significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

Source: own work.

The model was subject to substantive and formal verification and it was found it was valid. In view of the high level of coefficient of determination R^2, critical analysis of model has been conducted looking for a explanatory variable / variables that would be a duplication of data of dependent variable. Not found to occur such variables. Verification elimination of variables: I_Other_shareholders_funds_th_EUR and I_Full_financial_expense, resulted only in a

reduction in the level of Coefficient of determination R^2 only to a level significantly above 0.98, and also resulted in a significant deterioration of model parameters in the normal distribution of residuals. It was therefore concluded that these variables are not factors artificially enhancing model, but their absence causes deterioration of the quality of the model. In the second stage of the research a comparative analysis of businesses in Poland Czech Republic and Slovakia will be carried with the use of multiple comparisons (Kruskal-Wallis test).

Table 2. shows the results of the multiple comparisons - Kruskal-Wallis test. Null hypothesis has been formulated: variables specific to the Polish model do not differ from the corresponding variables characterizing the financial situation of small and medium-sized enterprises in Czech Republic and Slovakia. It was decided that the variables specific to Polish companies (at least some of them) may be similar in enterprises in Czech Republic and Slovakia (due to a similar geographical location, a similar level of economic development, and also bearing in mind historical changes in these countries).

Table 2. Results of multiple comparison - Kruskal-Wallis test for selected variables of private sector companies in Poland, the Czech Republic and Slovakia

Variable	Companies - Poland	Companies - Czech Republic	Companies - Slovakia
Tangible fixed assets thous. EUR	Yes	Yes	Yes
Other shareholders funds thous. EUR	Yes	Yes	Yes
Long term debt thous. EUR	Yes	Yes	Yes
Creditors thous. EUR	**No**	**No**	Yes
Net current assets thous. EUR	Yes	Yes	Yes
Number of employees	Yes	Yes	Yes
Full financial expense	Yes	Yes	Yes
Taxation thous. EUR	Yes	Yes	Yes
Material costs thous. EUR	Yes	Yes	Yes
Costs of employees thous. EUR	Yes	Yes	Yes
Depreciation thous. EUR	Yes	Yes	Yes
Interest paid thous. EUR	**No**	**No**	Yes

Source: own work.

The analyzes conducted lead to the conclusion that in comparable countries, there is a statistically significant variation of selected variables in the period 2006-2010 and therefore the null hypothesis should be rejected. Only two variables: Creditors thous. EUR and Interest paid showed no significant differences between firms engaged in economic activities in the two countries: Poland and the Czech Republic. However, there was no similarity between the variables in relation to Slovak companies. Therefore, it should be noted that despite some similar features for small and medium-sized enterprises operating in Poland, the Czech Republic and Slovakia, individualized analysis and separate models should be developed for each country. Therefore, analysis started in this study will form the basis for further research distressed entities of private sector in Czech Republic and Slovakia. The preliminary results of model of insolvency risk of Czech companies show that in addition to the variables specific to the Polish model (Table 1), a statistically significant variable is the cash flow (th

EUR). These studies, however, require further deepening, and in this study they will not be continued.

FINDINGS OF RESEARCH

Given the need to identify risk factors for private sector insolvency it was found that in addition to the variables characterizing the capital structure, particular attention should be paid to the variable cost, such as depreciation and cost of raw materials. It is important also to perform a critical review of existing and planned investments, costs incurred for production, as well as exploring the possibilities of reducing them (through the elimination of losses, negotiating prices and terms of delivery).

CONCLUSIONS

Economic instability of economies in many countries indicates the need to look for risk factors for private sector insolvency. Despite some close historical and geographical circumstances, it is not obvious that the same factors and to the same extent, influence the risk of insolvency of companies in Poland, Czech Republic and Slovakia. The importance of this threat of insolvency in private sector is so high that it requires further, in-depth research that will be continued.

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