

THE IMPACT OF ALTERATIONS IN THE LOCAL INSOLVENCY LEGISLATION ON BUSINESS BANKRUPTCY RATES IN POLAND

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ABSTRACT

The purpose of this paper is to analyze the number of insolvencies in Poland before and after the major bankruptcy code novelization in the second quarter of 2009. Authors check whether the novelization had its intended effect of reducing bankruptcy rates. Therefore, econometric models have been implemented to investigate changes in bankruptcy rates using quarterly data from the period 2003-2013. While controlling the variety of macroeconomic factors that have influenced insolvency rates, we found that after implementation of the novelization the aggregate bankruptcy rates significantly increased.

Key words: small and medium firms, aggregate bankruptcy rates, amendments to the law.

1. Introduction

Insolvency, which is the result of either law regulations or the court judgement (i.e. bankruptcy), can happen despite the economic reasons, leading to the cessation of the company. Company's liquidation regardless of its size, sphere of interest, territory or trade partners is the source of confusion and, more importantly, distress on the market (Zdyb, 2009). Economists agree that in a short period of time bankruptcy is harmful to the business market. However, in the long run the positive results of closing an ineffective company can be visible (Schumpeter, 1934).

The market itself is often unable to eliminate the unsuccessful entrepreneurs, e.g. it cannot eliminate from the market the companies functioning on the verge of cost-effectiveness. The protection procedures against disastrous outcomes of their activity are regulated by the bankruptcy law. It helps to avoid or minimize the

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negative consequences for the surrounding as a result of insolvency of the debtor. The regulations are necessary because no restrictions describe the conditions of setting up any business activity. The candidates to become entrepreneurs are not always suitable as well. Therefore, some of them fail due to the lack of competence, management errors and changes in the surrounding of a company.

In order to protect firms and investors from some consequences of bankruptcy in recent years, the number of countries in the European Union reformed their bankruptcy legislations (e.g. France, Germany, the UK, Spain, Finland, Italy, Belgium), while several other EU members are going to introduce similar regulations in the future. The main aim of these reforms was changing traditional, old framework, which was solely focused on liquidation, into a modern framework which should combine reorganization and liquidation. The effort is concentrated on creating more transparent and efficient system. The legal regulation in the new system should encourage more reorganization instead of liquidation only. The respective guidelines were outlined by the European Commission and the World Bank in order to suggest the best practice bankruptcy procedures (EC 2003; World Bank 2001). Economists assume that applied reforms in the bankruptcy system could lower aggregate bankruptcy rates³. In the EU the majority of failure cases concerns SMEs which essentially contributes to GDP in EU countries (cf. Hudson, 1986). Therefore, the reduction of the bankruptcy rates of small businesses should be an important topic in a bankruptcy reform. In addition, not all suggested legal regulations in the EU seem to be beneficial or useful for smaller firms. This problem occurs across different business sectors. Some industries are more represented in a country's economy than others and this fact can have significant implications. However, the mentioned problems have received not much attention in the economic literature. There is only little empirical evidence on the impact of bankruptcy legislation reform on aggregate bankruptcy rates in the EU besides UK. In the EU the financial system is based on banks. In Anglo-Saxon countries it is based on the market. Therefore, the impact of reforms in the Continental Europe is not always similar to the one in the Anglo-Saxon countries. In this context the question arises how the bankruptcy rates can be influenced by the implementation of recommendations of international best practices in the Continental Europe.

At the turn of the century there still existed antiquated bankruptcy law from 1934 in Poland. Therefore, in the nineties of the twentieth century Poland underwent long-anticipated, immense economical change. In the year 1990 there were about 1.2 million registered enterprises in Poland, whereas in the year 2000 the number increased up to 3 million. The growing number of companies

³ The aggregate bankruptcy rates are measured as the percentage of liquidation type bankruptcies to the total company population.

influenced the bankruptcy issue which applied to a wider group of entrepreneurs and, due to the new market situation, the law had to be readjusted. The new Bankruptcy and Remedial Act came into force in February 2003. The Act had been worked out according to the guidance of the European Commission and the World Bank (Zedler, 2003). The aim of remedial proceedings was to repay creditors with simultaneous attempt to preserve the existence of a company. In the following years the application of this new act was analyzed and the necessity of further changes was alleged. As a result, the Act of 6 March 2009 amending Bankruptcy and Remedial Act, Bank Guarantee Fund Act and National Court Register Act was signed on 12 March 2009 (the Amendment). The Amendment introduced more than 150 changes in Act of February 2003. The new solutions aimed at accelerating bankruptcy procedures and satisfying the creditor's claims to the debtor. The Amendment significantly reformed the remedial proceeding, which previously was rarely instigated. Under the Amendment the entrepreneur is allowed to fill the declaration of bankruptcy along with a demand of permission to initiate a remedial proceeding. Additionally, present recovery proceedings may concern the restructuring of not only monetary liabilities, but all liabilities which can be subject to an arrangement (Kallaur, 2009).⁴

Authors of this paper will examine if the introduced changes in the Polish legal system had significant statistical influence on aggregate bankruptcy rates in Poland. In particular, it will be tested if the aggregate bankruptcy rates after the novelization of 2009 were lower or higher than expected due to the existing macroeconomic conditions⁵. Visual inspection of the data suggests that the novelization in bankruptcy law in the second quarter of 2009 had positive effects on aggregate business bankruptcy rates in Poland. However, this first impression will be checked by means of quantitative tools.

The remainder of the paper is organized as follows: Section 2 overviews the existing literature. Data and methodology are presented in Section 3. In Section 4 the empirical results are discussed and Section 5 concludes.

2. Literature overview

Researchers of the insolvency are concentrated either on the risk of bankruptcy for specific firms or on modelling aggregate bankruptcy rates. The research stream concerning the bankruptcy of individual firms is reflected in the contribution by Greiner and Schein (1988). They argued that flexibility of the company depends mostly on the abilities and creativity of the owner. The

⁴ In the second quarter of 2009 the Act of 5 December 2008 was also adopted. Since then natural person not engaged in economic activity earned the possibility to declare the so-called consumer bankruptcy. The consumer bankruptcy statistics are not included in our calculations.

⁵ One may assume that the aggregate bankruptcy rates should have increased during the Global Financial Crisis.

companies adherent to old, uncompetitive solutions are swiftly eliminated from the market. In times of uncertainty and rapidly changing environment the lack of alterations inside the company often leads to its closure.

In the late sixties of the twentieth century quantitative methods (e.g. discrimination methods) became commonly used to predict the risk of bankruptcy. Altman (1968) was a pioneer in this type of research. The grouping into firms vulnerable to bankruptcy and those not was done on the basis of individual financial indicators of companies. Those ratios included: working capital to total assets ratio, retained earnings to total assets ratio (retained earnings - profits which were not paid out in dividends and which can be re-invested in the business), EBIT (Earnings Before Interest and Taxes) to the total assets ratio, the market value of equity to the book value of total liabilities and sales to total assets. Altman correctly classified up to 95 percent of companies the year before their bankruptcy and 83 percent two years before. The results of that research on the insolvency which uses discrimination methods can significantly differ from one another according to the country and time period. The reason is different propensity to bankruptcy in various periods. In addition, diverse indicators concerning situation of the company are applied. There is widely accepted point of view that researchers using the same set of variables but for companies from different countries or different time periods may obtain quite different results. Hence, some new attempts to form models are applied in order to allow to predict the bankruptcy.

The second stream of research aims at modelling of aggregate bankruptcy rates. It refers to macroeconomic factors. In the literature there is no doubt that macroeconomic factors play an important role in respect of bankruptcy. In particular, Hudson (1986), Ilmakunnas and Topi (1999) and Liu (2004) found that GDP growth or business cycle indicators are negatively correlated with aggregate failure rates.

Various authors argued that aggregate corporate birth rates (Hudson 1986, 1997; Johnson and Parker, 1994) and inflation rate (Altman, 1983; Wadhvani, 1986) are likely to have an impact on bankruptcy rates. However, the direction of the relationship is not clear as it may be either positive or negative. In the literature there is little evidence concerning the effect of macroeconomic environment on the bankruptcy of small enterprises.

The competitiveness of the market has a significant impact on the number of bankruptcies. According to Foster and Kaplan (2001) the failure of the company is a consequence of two parallel processes, namely destruction and creation. The researchers claim that initiation, directing and controlling of the creative destruction is conducted by the financial markets. The bankruptcy is mainly a tool of control and protection of the market.

Chen and Williams (1999) found that the US government assistance programmes lowered bankruptcy rates in high-technology industries. Australian

economists Everett and Watson (1998) established that in the case of small Australian retail enterprises between 30% and 50% of failures were caused by macroeconomic factors. The similar results with respect to small business failure in case of the US were derived by Peterson et al. (1983). On the basis on survey data they documented that economy wide factors are the reasons number two and three for small enterprises failure in the US (number one is a lack of management expertise). In line with these results Sullivan et al. (1999) proved that conditions in business surrounding are the most important reasons for bankruptcy.

Besides the macroeconomic environment, the effects of institutional factors on the aggregate bankruptcy rate attracted attention of economists. Claessens and Klapper (2005) demonstrated that formal bankruptcy in the economy depends on the bankruptcy legislation. In addition, the research on the effects of institutional change supported the important impact of legal reform on aggregate failure rates.

Fisher and Martel (2003) demonstrated that the 1992 Canadian bankruptcy reform had an influence on the number of filled corporate reorganization proposals. Cuthbertson and Hudson (1996) and Vlieghe (2001) based on the UK's 1986 Insolvency Act established a significant decrease in the corporate liquidation rate after the implementation of this reform. Liu and Wilson (2002) and Liu (2004) suggested that the beneficial effect became lower after about 4 years.

Dewaelheyns and van Hulle (2008) pointed that continental European countries recently reformed their bankruptcy legislations to stimulate reorganization and firm survival. They argued that the Belgian 1997 bankruptcy code reform, which implemented several international best practice recommendations, significantly reduced aggregate small and micro business bankruptcy rates. The contributors supplied evidence that the beneficial effect of the reform is similar among small firms (i.e. stock corporations) and micro firms (i.e. partnerships). Therefore, it was only significant in some industries (manufacturing and trade). Their results showed that especially the measures taken to limit domino bankruptcy effects were likely to have a substantial impact.

To summarize, from the literature discussed above we can learn that the corporate bankruptcy rates are related to numerous macroeconomic variables. The main goal of this paper is to examine if the legal reform also impacts aggregate bankruptcy rates in Poland. To fulfil this task the macroeconomic determinants of aggregate bankruptcy rates discussed in the literature above will be used in further calculations. These variables should be as complete and accurate as possible to describe the state of Polish economy before and after the legal reform. In particular, it should be remembered how difficult those years for the global economy were. There are strong links between the economic situation in Poland and other European countries, and because of that additional variables describing the relationship between the Polish and the EU economy will also be included in the further study.

3. Data and methodology

3.1. Presentation of dataset

The Polish law imposes on the Ministry of Justice a duty to report to public opinion information about bankruptcies pronounced in Polish courts. Acting on those reports authors calculated the aggregate bankruptcy rates from the period of 2003-2013. The data released by the Central Statistical Office of Poland (*GUS*) is used to estimate the percentage of bankruptcies out of the total number of enterprises⁶. With the use of previously mentioned literature we have distinguished a group of macro variables which, according to the theory, have influenced failures. Among those variables we may find aggregated number of start-ups, real *GDP* growth, the *OECD* composite leading indicator (*CLI*) for the euro zone countries and for Poland, return on the Warsaw Stock Exchange Index (*WIG*), current economic condition indicator (*BOSE*), inflation and average exchange rates *EURO/PLN*. All of the collected data come from various sources such as Polish Ministry of Justice, the Central Statistical Office of Poland, the National Bank of Poland and the *OECD*.

Table 1. Description of variables

Variable	Description (Δ stands for 1-Year change in)
ΔBR	quarterly business bankruptcy rate ⁷ (%)
ΔNEW	quarterly corporate birth rate ⁸ (%)
ΔGDP	growth in real <i>GDP</i> (%)
ΔCLI_{eu}	<i>OECD</i> euro zone composite leading indicator (%)
ΔCLI_{pl}	<i>OECD</i> Polish composite leading indicator (%)
$\Delta BOSE$	current economic condition indicator (%)
ΔWIG	return on the Warsaw Stock Exchange Index (%)
$\Delta INFL$	inflation (% , based on consumer price index)
$\Delta EUR/PLN$	average exchange rates (%)

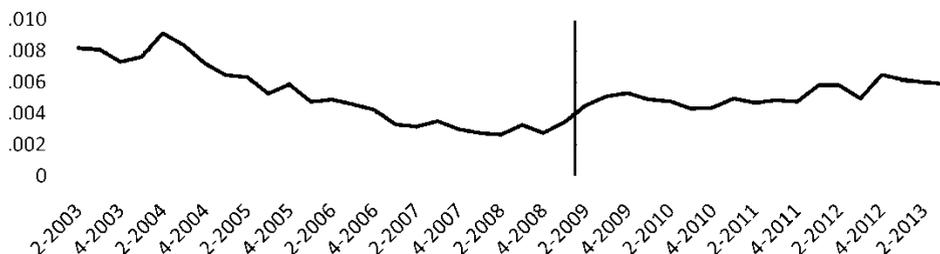
All available statistical data apply to the period between the introduction of the act and the third quarter of 2013. They were divided in to pre- and post-novelization periods (2003Q2-2009Q1; 2009Q2-2013Q3). Figure 1 shows quarterly bankruptcy rates in the concerned period.

⁶ It is important to realize that companies which managed to survive the bankruptcy procedure are not included in those statistics.

⁷ Quarterly business bankruptcy rate was calculated as the number of bankruptcies divided by the number of companies in existence at end of previous quarter.

⁸ Quarterly corporate birth rate was calculated as the number of new companies divided by the number of companies in existence at end of previous quarter.

Figure 1. Quarterly bankruptcy rates in Poland



Source: Polish Ministry of Justice (*iMSiG.pl*)

The first conclusion derived from the visual examination of the picture is that overall bankruptcy rates significantly increased after the novelization. Previously, after the introduction of a new law in 2003, the indicator had been on a really high level, whereas later it started to decrease until reaching the lowest point in 2008. Immediately after the novelization in 2009 the number of failures considerably rose. In subsequent years quarterly bankruptcy rates were on the similar level reaching the values approximately twice higher than the ones in 2008. During the examined period 8134 companies bankrupted – before the novelization the mean was 190 bankruptcies per quarter, whereas after the novelization it increased to the level of 202. Of course, the rise of bankruptcy rates in Poland since 2009 reform may be, to some extent, not only the effect of novelization of 2009, but also of the essential slowdown of Polish economy as result of the world financial crisis in subsequent years. Table 2 shows the summary statistics and basic equality tests for selected variables in each selected period. It presents mean, median as well as the Kruskal-Wallis test for median (χ^2 distributed) and t-test for equality of means.

Table 2. Summary statistics and p-value for equality tests

Variable	Full period		Period I		Period II		p-value for equality tests	
	median	mean	median	mean	median	mean	Kruskal-Wallis test	t-test
	ΔBR	0.000	0.004	-0.001	-0.001	0.000	0.009	0.000***
ΔNEW	0.121	0.067	0.118	0.086	0.148	0.044	0.977	0.622
ΔGDP	4.275	4.082	5.443	5.125	3.097	2.854	0.001***	0.000***
ΔCL_{Ieu}	0.302	0.101	0.302	-0.227	0.248	0.466	0.807	0.430
ΔCL_{Ipl}	-0.156	-0.207	-0.968	-0.686	0.057	0.356	0.044**	0.017**
$\Delta BOSE$	0.100	0.870	3.600	2.025	-1.100	-0.488	0.306	0.500
ΔWIG	0.185	0.144	0.280	0.184	0.150	0.097	0.128	0.388
$\Delta INFL$	-0.100	0.111	1.000	0.585	-0.450	-0.417	0.085*	0.098*
$\Delta EUR/PLN$	-0.018	-0.004	-0.047	-0.036	-0.047	0.032	0.026**	0.052*

*** denotes significance at the 1% level; ** denotes significance at the 5% level; * denotes significance at the 10% level

The performed tests prove that both mean and median failure rates are significantly different across sub-periods. Finally, the data on macro variables indicate significant differences in mean (median) for real *GDP* growth, change in the *OECD* Polish composite leading indicator, inflation and the average *EUR/PLN* exchange rate. It suggests that these conditions may have an important impact on bankruptcy rates.

As it has already been mentioned for the proper analysis of changes in the aggregate bankruptcy rates it is necessary to take into account the effects of global economic crisis. It is usually considered to start in the years 2007-2008, but many economists relate it to the bankruptcy of the Lehman Brothers Holdings Inc. in September 2008. Therefore, a simple analysis concerning bankruptcy rates needs to be extended by statistical models containing previously chosen macroeconomic data.

3.2. Outline of methodology

In general, we assume that the aggregate failure rate depends on current and historical values of certain variables (Altman, 1983). It may be written in the form of finite distributed lag model (*FDL*):

$$BR_t = \alpha_0 + \sum_{i=1}^k \sum_{j=0}^T \alpha_{i,j} X_{i,t-j} + \varepsilon_t \quad (1)$$

where X_i is a macroeconomic variable, k is the number of variables and T is the maximum lag length.

Estimation of parameters from *FDL* model leads to certain difficulties. In our case the number of periods T , covered by lag function is so large that the individual coefficients cannot be estimated with sufficient accuracy. In addition, our variables are highly autocorrelated. High levels of correlation among the regressors imply multicollinearity, which leads to unreliable coefficient estimates with large variances and standard errors. In both scenarios the Almon polynomial distributed lag (*PDL*) specification could be helpful. The method assumes that any $\alpha_{i,j}$ can be approximated by a polynomial of order p :

$$\alpha_{i,j} = \beta_{i,0} + \beta_{i,1}j + \beta_{i,2}j^2 + \dots + \beta_{i,p}j^p. \quad (2)$$

We begin with substituting equation (2) into (1):

$$BR_t = \alpha_0 + \sum_{i=1}^k \sum_{j=0}^T (\beta_{i,0} + \beta_{i,1}j + \beta_{i,2}j^2 + \dots + \beta_{i,p}j^p) X_{i,t-j} + \varepsilon_t$$

$$BR_t = \alpha_0 + \sum_{i=1}^k \sum_{n=0}^p \beta_{i,n} \left(\sum_{j=0}^T j^n X_{i,t-j} \right) + \varepsilon_t \quad (3)$$

By defining new variables as follows:

$$Z_{i,n,t} = \sum_{j=0}^T j^n X_{i,t-j} \quad (4)$$

we have a linear model of an ordinary form:

$$BR_t = \alpha_0 + \sum_{i=1}^k \sum_{n=0}^p \beta_{i,n} Z_{i,n,t} + \varepsilon_t \quad (5)$$

The method of polynomial approximation allows us to use all estimation methods which are appropriate for linear equations. In order to fulfil standard least squares assumptions, during our investigation we work on 1-year changes of macroeconomic variables. It helps to eliminate problems with stationarity and seasonality from time-series used in our research.

4. The empirical results

The problem of the autocorrelation is one of the basic problems for researchers of statistical relations between macroeconomic variables in time, and yet application of *PDL* model allows one to avoid the autocorrelation between historical values of the specific variable. Therefore, we start with estimation of *PDL* models containing only single variables. In order to correctly fit more complicated models, variables will be selected in a way to limit correlations between them.

4.1. Models with single macroeconomic variable

It is important to realize that before the approximation of coefficients begins, the decision about the lag length (T) and the order of polynomials (p) must be taken. In our case we used three criteria: the Schwartz information criterion, the Akaike information criterion and the Hannan–Quinn information criterion⁹. With the intention of examining whether amendments to the bankruptcy law influenced significantly the number of adjudicated bankruptcies we chose to use Chow Breakpoint Test. We decided to split the sample period (2003Q2 – 2013Q3) into pre- and post-reform period. The results of conducted estimations are reported in Table 3. On the left side parameters for models without break adjustment are presented and the right side of the table reports statistics for models including jump dummy to control for law change (*SPLITDUM*). Because of limited space available in Table 3 we decided to report only the sum of the lag term's coefficients. The importance of the sum was verified using t-statistics based on Newey-West HAC standard errors.

⁹ In general, a lag length of 4 periods and polynomials of order 2 result in the best fit.

Table 3. Bankruptcy rates estimation: models with single macroeconomic variable

Macroeconomic variable	no regime changes		regime change 2009Q2			
	lag_SUM	Adj. R ²	lag_SUM	Chow TEST	SPLITDUM	Adj. R ²
ΔNEW	0.0011	0.0032	-0.0001	6.5633***	0.0006***	0.4048
ΔGDP	-0.0001***	0.1750	-0.0006	6.2085***	0.0013*	0.5562
ΔCLIeu	-0.0001***	0.3117	-0.0011	14.2499***	0.0005***	0.5539
ΔCLIpl	-0.0004	0.0229	-0.0008	12.5859***	0.0007***	0.2070
ΔBOSE	-0.0000***	0.5446	0.0005	5.9641***	0.0005***	0.5925
ΔWIG	-0.0003***	0.5467	-0.0032	16.1954***	0.0007***	0.7165
ΔINFL	0.0000	-0.0526	0.0005	3.1774**	0.0006**	0.0328
ΔEUR/PLN	0.0047***	0.6237	-0.0005	2.4314*	0.0004**	0.6805

Notes: PDL models with yearly change in quarterly business bankruptcy rates as dependent variable; only cumulative lag coefficients reported; t-statistics based on Newey-West HAC standard errors used; Chow Breakpoint Test statistics for break in 2009Q2.

*** denotes significance at the 1% level; ** denotes significance at the 5% level; * denotes significance at the 10% level

The presented results confirm the existence of statistically significant relationship between selected macroeconomic variables and changes in aggregate business bankruptcy rates. According to calculations based on Newey-West HAC standard errors, the sum of the lag term coefficients proves to be significant for models with real GDP growth, the OECD composite leading indicator (CLI) for the euro zone countries, the BOSE indicator, return on the Warsaw Stock Exchange Index (WIG) and the average EUR/PLN exchange rates. Presented values for long run relationship between all proxies are in line with the literature and reasonable expectations. The bankruptcy rates increase as the birth rates for new companies, the inflation and EUR/PLN exchange rates decline. According to the adjusted R² the model fit is the lowest for the inflation and the highest for changes in exchange rates. In all estimated models the Chow breakpoint test points to possible structural breaks in the second quarter of 2009 – when the novelization was introduced. The SPLITDUM, which has a value of 1 after the new legislation came into effect is significant for all models. It is worth noticing that models with the new dummy got considerably higher adjusted R². The presented results suggest that aggregate bankruptcy rates after the novelization are higher than expected according to the macroeconomic conditions.

4.2. Model with multiple macroeconomic variables

In the last part of this chapter we decided to use two stage least square (2SLS) for proper estimation of coefficients. This approach allows us to control expected endogeneity issues which are caused by multicollinearity of macroeconomic variables. While selecting variables to the model we used backward regression to eliminate insignificant and correlated variables. Therefore, as a result we estimated models having only four explanatory variables and using all remaining variables defined in Table 1 as instruments. The first two selected variables are year-to-year change in average exchange rates *EUR/PLN* and yearly return on WIG, as both had the highest adjusted R^2 among models with single macroeconomic variables and both could be approximated by chosen instruments. Furthermore, only one general macroeconomic indicator is taken, as current economic condition indicator (*BOSE*) was shown to lead to the best fit. The jump dummy for change in bankruptcy law is also included. Table 4 reports the results of aggregate bankruptcy rates estimation using 2SLS method for selected variables¹⁰.

Table 4. Bankruptcy rates estimation: model with multiple macroeconomic variables

Variable	$\Delta BOSE$	ΔWIG	$\Delta EUR/PLN$	<i>SPLITDUM</i>
Cumulative lag coefficient	-0.00006**	-0.00381***	-0.00521***	0.00075***
Adjusted R^2	0.81141			

Notes: *PDL* model estimated by 2SLS with yearly change in quarterly business bankruptcy rates as dependent variable; instruments are: ΔNEW , ΔGDP , $\Delta CLIEu$, $\Delta CLIPl$, $\Delta INFL$; only cumulative lag coefficients reported; results of *t*-test based on Newey-West HAC standard errors reported.

*** denotes significance at the 1% level; ** denotes significance at the 5% level;

* denotes significance at the 10% level

Table 4 confirms the findings from our previous research based on *PDL* models with single macroeconomic variable. Each of the chosen macroeconomic conditions has proven to be significant¹¹. Calculated adjusted R^2 is high and leads to conclusion that bankruptcy rates are well explained by the applied model. Estimated coefficients indicate that when *BOSE* indicator, Warsaw stock (*WIG*) and average *EUR/PLN* exchange rates increase, then in response the business bankruptcy rate (*BR*) declines. Nevertheless, the *SPLITDUM* dummy continues to be statistically significant with positive sign. It is worth to mention the correspondence between current results and those received from the previous

¹⁰ As a robustness check models with different sets of explanatory variables have been estimated. In all of these models, findings remain similar with those presented.

¹¹ Moreover we performed the Sargan test for testing over-identifying restrictions and the null hypothesis that the over-identifying restrictions are valid was rejected with p-value 0.26.

subsection. Most importantly the result is in line with the main thesis of this paper which is the positive impact of the novelization in the bankruptcy law in the second quarter of 2009 on aggregate business bankruptcy rates in Poland.

5. Conclusions

The economic growth in Poland, as recorded since the nineties, resulted in the necessity of novelization in the bankruptcy legislation. The new bankruptcy law was introduced in 2003 and was originally designed in favour of the reorganization type of bankruptcy rather than liquidation. An efficient bankruptcy code should have allowed enterprises to be restructured. It included several international best practice recommendations adopted to the legal system. After six years it became clear that some of available formal procedures were not in use (i.e. they are superfluous) and the novelization of law was necessary. According to lawmakers new solutions improved insolvency procedures and made the whole bankruptcy process faster.

Our findings prove that after the Amendment bankruptcy rates in Poland increased more significantly than expected due to the existing macroeconomic conditions. This conclusion is confirmed by analyses based on two general concepts of measuring differences in aggregate bankruptcy rates. The novelization extended variety of insolvency rules. We suggest that the further effort should be applied to create even more transparent and efficient legal system. The Amendment not only encouraged to conduct reorganization, but also broadened the range of companies that could benefit from such reorganization. However, it is still impossible to start a recovery proceedings without an application for bankruptcy. Entrepreneurs often do not use this option, because the word 'bankruptcy' has a negative connotation in the colloquial language and in their opinion it could harm their businesses. As a result entrepreneurs often start bankruptcy proceedings when it is too late to save their businesses.

We recommend that future research should be concerned with the impact of differences in size and business sectors of firms on their failure rates.

Acknowledgement

We would like to thank the two anonymous referees for valuable comments and suggestions on earlier versions of this paper.

REFERENCES

- ALTMAN, E. I., (1968). Financial Ratios, Discriminant Analysis and the Prediction of the Corporate Bankruptcy, *The Journal of Finance*, Vol. 23, pp. 589–609.
- ALTMAN, E. I., (1983). Why business fail, *Journal of Business Strategy*, Vol. 3(4), pp. 15–21.
- CHEN, J. H., WILLIAMS, M., (1999). The determinants of business failures in the US low-technology and high-technology industries, *Applied Economics*, Vol. 31, pp. 1551–1563.
- CLAESSENS, S., KLAPPER, L. F., (2005). Bankruptcy around the World: Explanations of its relative use, *American Law and Economics Review*, Vol. 7, No. 1, pp. 253–283.
- CUTHBERTSON, K., HUDSON, J., (1996). The determinants of compulsory liquidations in the UK, *The Manchester School of Economic and Social Studies*, Vol. 64, No. 3, pp. 298–308.
- DEWAELEHEYN, N., VAN HULLE, C., (2008). Legal reform and aggregate small and micro business bankruptcy rates: evidence from the 1997 Belgian bankruptcy code, *Small Bus Econ*, Vol. 31, pp. 409–424.
- EUROPEAN COMMISSION, (2003). BEST project on restructuring, bankruptcy and a fresh start: Final report of the expert, *Enterprise Directorate-General*.
- EVERETT, J., WATSON, J., (1998). Small business failure and external risk factors, *Small Business Economics*, Vol. 11, No. 4, pp. 371–390.
- FISHER, T. C. G., MARTEL, J., (2003). The effect of bankruptcy reform on the number of corporate reorganization proposals, *Canadian Public Policy*, Vol. 29, No. 3, pp. 339–350.
- FOSTER, R., KAPLAN, S., (2001). Creative Destruction, *Financial Times*.
- GREINER, L. E., SCHEIN, V. E., (1988). Power and Organization Development, *Addison-Wesley*.
- HUDSON, J., (1986). An analysis of company liquidations, *Applied Economics*, Vol. 18, pp. 219–235.
- HUDSON, J., (1997). Company bankruptcies and births matter, *Applied Economics*, Vol. 29, pp. 647–654.
- ILMAKUNNAS, P., TOPI, J., (1999). Microeconomic and macroeconomic influences on entry and exit of firms, *Review of Industrial Organization*, Vol. 15, pp. 283–301.

- JOHNSON, P., PARKER, S., (1994). The interrelationships between births and deaths, *Small Business Economics*, Vol. 6, No. 4, pp. 283–290.
- KALLAUR, K., (2009). Bankruptcy and Remedial Act after recent changes, *Polish Construction Review*, Vol. 4(97), pp. 16–17.
- LIU, J., WILSON, N., (2002). Corporate failure rates and the impact of the 1986 insolvency act: An econometric analysis, *Managerial Finance*, Vol. 28, No. 6, pp. 61–71.
- LIU, J., (2004). Macroeconomic determinants of corporate failures: Evidence from the UK, *Applied Economics*, Vol. 36, pp. 939–945.
- PETERSON, R. A., KOZMETSKY, G., RIDGWAY, N. M., (1983). Perceived causes of small business failures: A research note, *American Journal of Small Business*, Vol. 8, No. 1, pp. 15–19.
- SCHUMPETER, J. (1934). The Theory of Economic Development: An inquiry into profits, capital, credit, interest and the business cycle, *Transaction Publisher*.
- SULLIVAN, T. A., WARREN, E., WESTBROOK, J., (1999). Financial difficulties for small businesses and reasons for their failure, *US Small Business Administration Office of Advocacy Research Study*, No. 188.
- VLIEGHE, G. W., (2001). Indicators of fragility in the UK corporate sector, *Bank of England Working Paper* 146.
- WADHWANI, S. B. (1986). Inflation, default premia and the stock market, *The Economic Journal*, Vol. 96, pp. 120–138.
- WORLD BANK, (2001). Principles and guidelines for effective insolvency and creditor rights systems.
- ZDYB, M. (2008). Jakie czynniki generują upadłości przedsiębiorstw w Polsce? Przyczyny upadłości przedsiębiorstw w Polsce, *Biuletyn E-rachunkowość*.
- ZEDLER, F., (2003). Prawo upadłościowe i naprawcze–wprowadzenie, *Zakamycze*.