

DEFAULT STUDY

Default Rates in the German Economy

2016

Market analyses
April 2017



Management Summary

1.

Against the background of a robust macroeconomic environment, the German corporate sector has also gained stability: the percentage of companies in default fell considerably to just 1.45% – a significant decrease of 0.15 percentage points from 2015, when the default rate stood at 1.60%. The empirical default rate thus continued to follow its long-term downward trend, falling to a new low.

2.

Particularly notable in 2016 is a significant decline in the default risk for smaller segments of the German corporate sector over the previous year. At the end of 2016, the percentage of corporate defaults had fallen from 1.68 to 1.52% for microenterprises generating less than 500,000 euros per year. The only companies which fared better last year were those with revenues of 2-10 million euros; the default quota for these enterprises fell by 0.18 percentage points to only 0.94% within the year. By contrast, default rates at the other end of the corporate spectrum, coming from very low levels, increased marginally.

3.

Our calculations for 2016 also show that empirical default rates over the year were in decline across all industry sectors. The lowest default risk remains with the primary industry, with a default rate of 0.79%. The consumer goods and chemical industries showed sharper declines, with defaults falling from 1.42 and 1.20% in 2015 to the current 1.18 and 0.99%, respectively.

4.

As in the previous year, the lowest ranking went to the city-states Berlin and Bremen, with comparatively high default rates of 2.01 and 1.71% respectively, although default rates here are also on the decrease. The lowest default rates are in the corporate sector in the federal states of Thuringia and Bavaria, at 1.14 and 1.23%; again, considerably lower than in 2015, when default rates were at 1.20 and 1.39%, respectively.

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5.

On the whole, we expect a slight decrease in German GDP growth to 1.6% over the current year, primarily due to the lower number of working days. Thus, we expect the German economy to continue along its solid trajectory. Based on positive growth projections, the empirical default rate for the German economy should remain on its downward trajectory, once again falling beneath its all-time low in 2017. We expect a slight decrease to 1.41%.

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1. Definitions and data pool

This analysis aims to outline the current risk situation of German enterprises based on the empirical default rates. The study builds on data from the Creditreform Business Database that contains facts and figures for about three million businesses (companies and self-employed individuals) that are domiciled in Germany and about those companies that are either insolvent or considered to represent credit risks. Thus, the database provides a full representation of the corporate sector in Germany and is considered to represent the most comprehensive database of German companies worldwide. It features up-to-date information about corporate finances, levels of financial strength and organizational characteristics. Data include headcounts and sales revenue figures as well as information about the type of business activity, the legal structure of the company in question and court records of negative entries (see the Appendix for a more detailed list).

This analysis is based on a definition of default events that complies with the criteria of Basel III. Accordingly, a business is considered to be in default when (i) insolvency proceedings have been opened against the business itself; (ii) consumer insolvency proceedings have been opened against one or several of its executives; or (iii) an arrest order or an affidavit have created a situation under which the company is regarded as having defaulted. We also refer to these criteria collectively as 'hard negative entries'. An enterprise is also in default when it must be assumed on the basis of the Creditreform information that it is highly unlikely to meet its payment obligations. Thus, this definition of a default – which is also used by banks – goes further than the official statistics which only record the number of insolvencies, for example by including companies that have run up arrears of 60 or 90 days.

This analysis is focused on one-year default rates. For the purposes of this analysis, companies were in default when either defaulted payments or hard negative entries were recorded for them on 31 December 2016, after they had been classified as solvent one year earlier (on 31 December 2015). At the end of 2016, approx. 2.703 million enterprises were classified as active businesses in Germany. These are companies that actively engage in trade activities and in the financial markets. All groups and sub-groups that are introduced on the following pages, no matter by which structural characteristics they may be defined, are representative samples.

2. Default rates in the German corporate sector

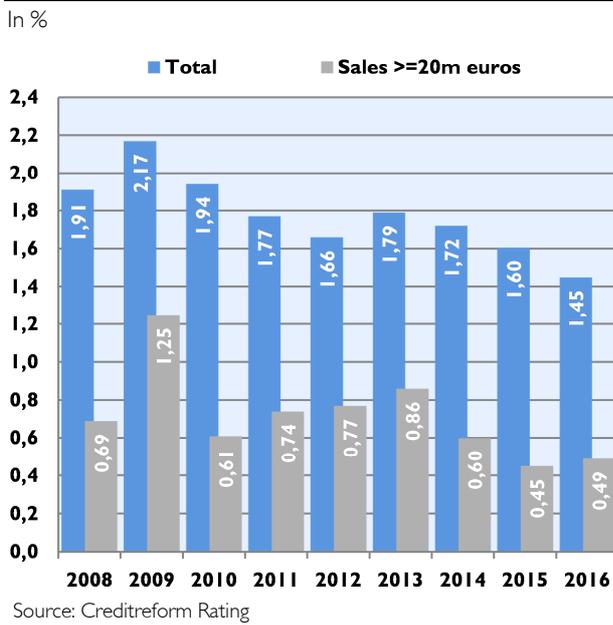
German growth continued to strengthen in the past year. The real gross domestic product (GDP) increased by 1.9% after economic output in 2015 surpassed the previous year's level by 1.7%. At the same time, there was a noticeable decline in GDP growth in the autumn of last year (+0.1%), after a buoyant first half of the year which saw q-o-q growth rates of 0.7 and 0.5%, respectively. Economic activity picked up again in the final quarter, resulting in a 0.4% rise in real GDP from the third quarter.

As in previous years, the most significant economic impulses came from domestic demand. Like in the previous year, there was a 2.0% rise in private consumer spending, making it the largest contributor to German economic growth (1.1 percentage points). Public consumption spending accounted for another 0.8 percentage points, having been increased by 4.0% in 2016. Underpinned by buoyant construction investment (+3.0% y-o-y), gross fixed capital formation increased by 2.3% while

net exports subtracted 0.2 percentage points from growth.

Against the background of a robust macroeconomic environment, the German corporate sector has also gained further stability; the percentage of companies in default fell sharply to a low 1.45%, corresponding to just under 40,000 enterprises - a considerable decrease of 0.15 percentage points from 2015, when the default rate stood at 1.60% (see fig. 1). Thus, while the German economy continued to grow vividly, the empirical default rate continued on its downward trajectory, reaching a new low. For orientation: four years ago, the German default rate stood at a significantly higher level, with 1.79%.

Fig. 1: Development of empirical default rates

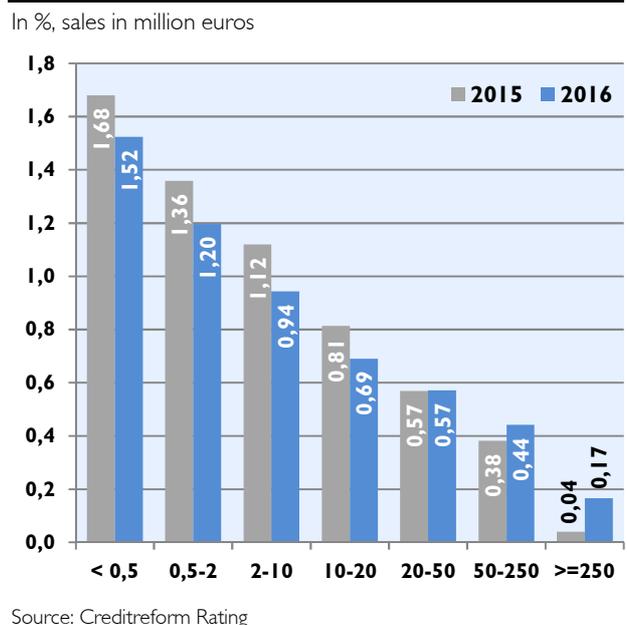


Meanwhile, the number of defaults in the SME sector (annual revenues of 20m euros or more) remains very low, despite the current modest rise of the respective default rate. The default rate for SMEs increased from the previous year from 0.45 to 0.49%; however, this sector remains considerably below the overall economic average, which is

almost three times that figure with a default rate of 1.45%.

The fact that the default risk decreases considerably with the increasing size of a company has already been sufficiently discussed in past default studies. In some respects, this is one of the stylized facts which we have presented in detail in recent years. Particularly noticeable in 2016 is that the default risk in smaller segments of the German corporate sector has fallen considerably year-on-year (see fig. 2). At the end of 2016, the percentage of corporate defaults had fallen from 1.68 to 1.52% for microenterprises generating less than 500,000 euros per year. Likewise, the corporate sector of companies taking in revenues of between 0.5 and 2m euros saw a 0.16% decline (2016: 1.20%). The only companies which fared better last year were those with revenues of 2-10 million euros; the default quota for these enterprises fell by 0.18 percentage points to only 0.94% within the year.

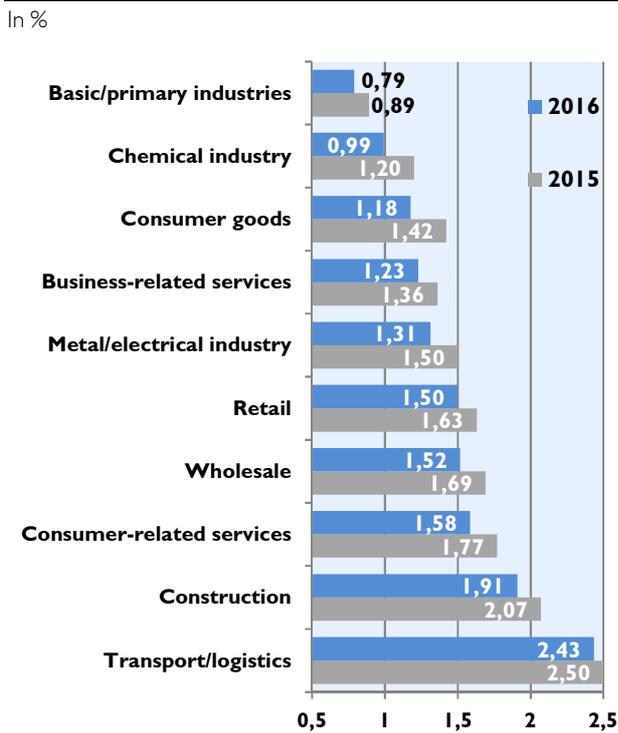
Fig. 2: Default rates by company size



By contrast, our calculations for 2016 show that default rates at the other end of the corporate

spectrum experienced a slight increase from very low levels. The capital-market relevant sector of companies with revenues between 50 and 250m euros showed a default rate of 0.44%, just above that of the previous year (0.38%). The increase for enterprises with revenues of >=250m euros was more noticeable; 0.13 percentage points on a low 0.17% defaults. It should be noted here that default rates in these segments are, as a matter of course, subject to higher degree of fluctuation due to the smaller number of companies. In these segments, a rise in the number of defaults by only one or two companies can result in a significant increase in the overall default rate, which should not be a cause for alarm in this case.

Fig. 3: Default rates by industry sectors

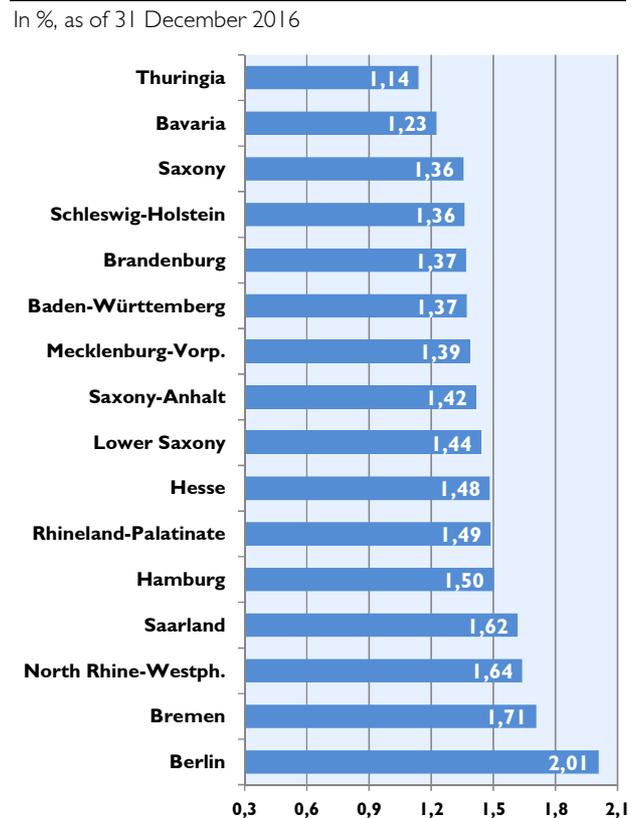


Source: Creditreform Rating

Notably, from the analysis of empirical default rates, we see that these were in decline throughout the year across all industry sectors (see fig. 3). The lowest default risk remains with the primary industry, with a default rate of just about 0.79%. At

the same time, this sector saw the smallest decrease. For comparison, with 0.10 percentage points the primary sector drops off significantly compared to sectors such as the consumer goods and chemical industries, where default rates have fallen from 1.42 and 1.20% to a current 1.18 and 0.99%, respectively. The default rate for business-related services is also comparatively low at 1.23% (2015: 1.36%), as well as that for companies in the metal and electrical industry, with 1.31% (2015: 1.50%). The worst performers in the sector comparison remain the construction and logistics sectors, which have seen the highest default rates (1.91 and 2.43%, respectively), despite decreases of 0.16 and 0.07 percentage points.

Fig. 4: Default rates by federal states



Source: Creditreform Rating

The geographical pattern of default risk in 2016 showed little change (see fig. 4). As in the previous year, our study shows that the city-states Berlin

and Bremen ranked lowest and, with default rates of 2.01 and 1.71% respectively, have comparatively high default rates. Nevertheless, the number of defaulting companies is in decline; the previous year's default rates were 2.30 and 1.86%, with one of the most significant decreases in Berlin. Only in Saxony-Anhalt was the decline in corporate defaults more pronounced, falling within the year from 1.79 to 1.42% (-0.37 percentage points). The lowest default rates are in the corporate sector in the federal states of Thuringia and Bavaria, at 1.14 and 1.23%; again, considerably lower than in 2015, when default rates were at 1.20 and 1.39%, respectively.

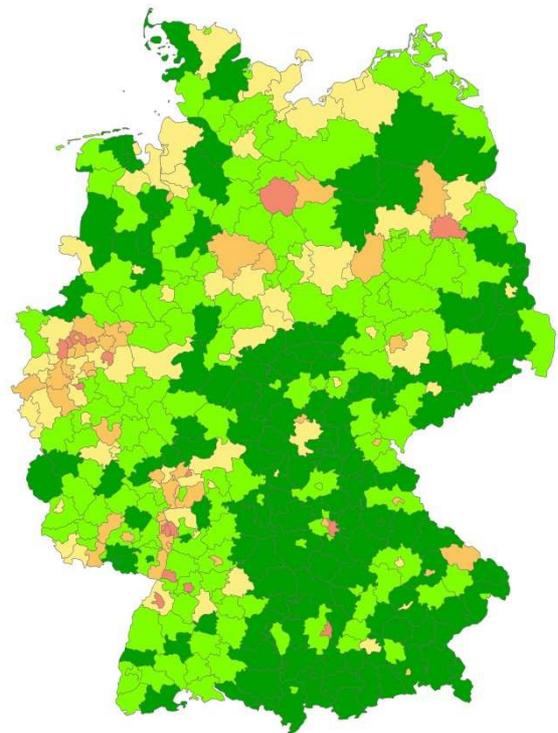
If we look one geographical level lower, to the level of German cities and districts (Landkreise), we see that companies in Bavaria seem to be subject to a very low default rate (see fig 5). Of the 15 cities and districts with the lowest default rates in 2016, 14 were located in Bavaria. The leading position was occupied by Dillingen an der Donau, with 60 defaults per 10,000 companies the city with the fewest defaults in Germany, closely followed by the district of Straubing-Bogen, likewise with an extremely low default rate of 0.61%. These were followed by Bayreuth and Forchheim (each with 0.67%), two Bavarian municipalities. By contrast, the risk situation was less favorable in Herne and Offenbach, with default rates of 2.32 and 2.31 respectively, where a relatively large number of companies defaulted. Only companies in Frankenthal found themselves subject to an even higher default risk; 2.42% of all enterprises here defaulted last year.

Notable in the context of this district evaluation is that the North Rhine-Westphalian corporate sector seems to be particularly fraught with risk; recently, six of the 15 cities and districts with the highest default rates were located between Rhine and Ruhr. In this state with its large number of big

cities and urban centers, the urban-rural gap - in which companies located in rural areas tend to be less vulnerable to default than those based in the cities - is particularly apparent in North Rhine-Westphalia. This is supported by the fact that Nürnberg (2.29%) and Augsburg (2.05%) are two cities in the otherwise very stable region of Bavaria which are also among the 15 municipalities with the highest default rates.

Fig. 5: Default rates by districts in 2016

Number of companies in default by district in %



< 1,20%	1,50% - 1,74%	2,00% - 2,49%
1,20% - 1,49%	1,75% - 1,99%	>= 2,50%

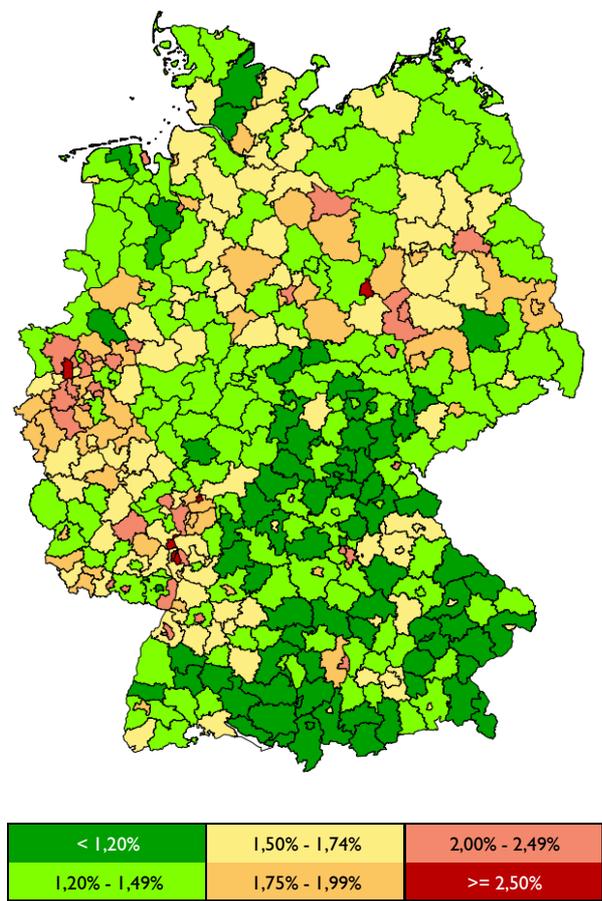
Source: Creditreform Rating

Despite elevated default risks in some parts of the country, the general risk situation has improved year-on-year (see fig. 6). Thus, seven out of ten

German cities and districts (70.4%) showed a lower default rate than in 2015. However, the extent of the decrease varied; the default risk declined most noticeably in Worms and Salzgitter, with default rates at 1.89 and 1.41% in 2016, after standing at 3.07 and 2.47% in 2015. Contrary to the macroeconomic trend, the risk situation has deteriorated in several municipalities.

Fig. 6: Default rates by districts in 2015

Number of companies in default by district in %



Source: Creditreform Rating

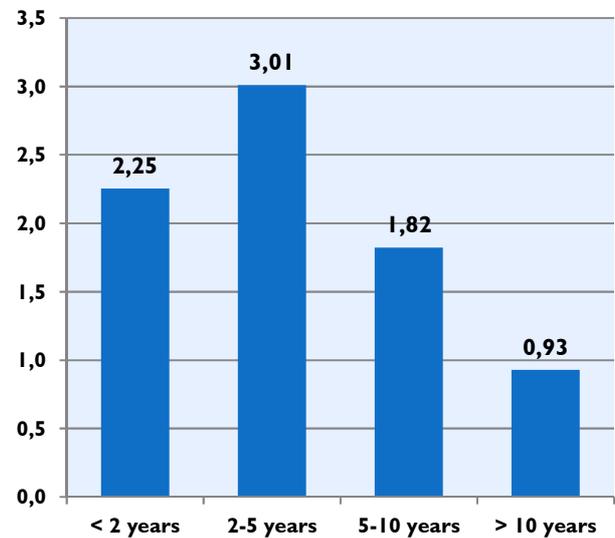
The Thuringian city of Suhl saw the most significant rise in its default rate of all the 402 cities and districts evaluated. While only 90 companies out of 10,000 were in default here in the previous year, the number of defaults in 2016 was considerably higher, at 190. Likewise in Regen, where a

default rate of 1.90% was recorded (2015: 1.15%), as well as in Hagen and Bottrop, the default risks have risen relatively sharply. While 1.34 and 1.49% of local companies defaulted in the two Ruhr area-cities in 2015, the default rate rose within the year to 2.00 and 2.10%, respectively.

With regard to the age of a company, the highest default risk exists after the start-up phase (see fig. 7). While 2.25% of newly established companies defaulted within the first two years, the default rate for enterprises between two and five years old was, at 3.01%, disproportionately high at the end of 2016. The gap between these two age segments has remained more or less unchanged; in 2015, the default rates stood at 2.39 (< 2 years) and 3.21% (2-5 years).

Fig. 7: Default rates by age of company

In %, as of 31 December 2016



Source: Creditreform Rating

The default risk diminishes noticeably as the age of a company increases. Thus, 1.82% of the startup companies between five and ten years old defaulted, while this was the case for only 0.93% of the well-established enterprises operating for over ten years (2015: 1.96 and 1.05%, respectively).

3. Outlook

This study of empirical default rates in the German economy shows new lows being reached last year. Thus, we saw the lowest default rate on record with 1.45%, falling well below that of the previous year's 1.60%. Based on positive growth projections, this trajectory should continue over the current year.

Early indicators suggest that the current growth momentum will continue in the coming quarters. The ifo business climate index for the business economy quotes an index value of 112.9 points in April 2017, considerably above the 106.7 points of the preceding month. In March 2017, the Index for the Manufacturing Sector had likewise climbed to its highest point since July 2011. As regards economic prospects, the Purchasing Managers Index (PMI) also paints a very optimistic picture. At the end of the quarter, the PMI recorded the fourth consecutive increase for the manufacturing sector to 58.3 points, the highest value reached since April 2011. The PMI Composite Index also increased to a 71-month high. The sharp upward trend in the moving 3-month average for new orders is an indication for an acceleration of economic activity in the German industrial and construction sector.

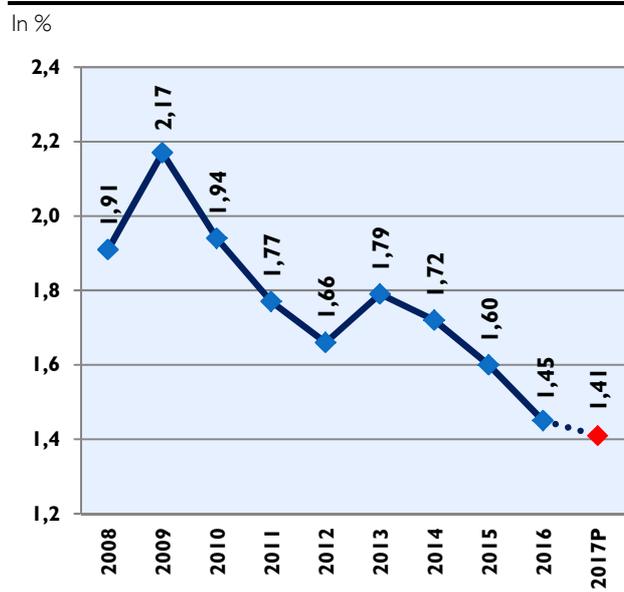
That said, in our view the current increase in political uncertainty calls for caution. The British prime minister surprisingly announced new parliamentary elections for 8 June, 2017. The coming months will reveal the shape of future relations between the United Kingdom and the euro area, as well as what the effects of Brexit will be on the German economy - although there should not be any noticeable negative impulses in 2017.

On the whole, we expect a slight decrease in German GDP growth to 1.6% in the current year, primarily due to the lower number of working

days. Although in our view the survey-based early indicators somewhat exaggerate the economic momentum, we expect the German economy to continue on its current solid trajectory. Supported by the robust labor market, high net migration, and favorable financing conditions, private consumption is set to remain the most important economic pillar. A buoyant construction industry and robust exports should also provide some tailwinds for German economic growth.

Thus, the current favorable economic environment should contribute to a continued downward trajectory for the empirical default rate in the German economy, which should, once again, fall below its historic low in 2017. We expect a slight decrease to 1.41% (see fig. 8).

Fig. 8: Forecast of the default rate in 2017



Source: Creditreform Rating

Appendix

Data pool and definitions of the individual industries

The Creditreform Business Database contains up-to-date information about corporate finances and levels of financial strength. Each quarter, a dataset is created and archived for all active businesses in Germany. This data pool allows detailed and customized analyses of the developments in selected enterprises and industries. Information about individual businesses that is collected and selectively available in the database includes the following:

- Full business address, federal state (code), county (code) and post code
- Date of establishment, headcount and total sales, legal form, credit information
- Ownership / shareholder structure, size of individual shareholdings and other information about the partners / founders (incl. their number, age and sex)
- Court records of negative characteristics
- Five-digit industry code ("WZ") according to the Classification of Economic Activities, released by the German Federal Statistics Office in 2008.

Based on the aforementioned Classification of Economic Activities of the German Federal Statistics Office, we established industry clusters for the purpose of our comparative analyses (see fig. 9).

Fig. 9: Classification of industry clusters based on the WZ Code 2008

Industry	WZ 2008
Basic and primary industries	01-09, 19, 23
Business-related services	61-63, 69-74, 77-78, 80-82
Chemical industry	20-22
Construction	41-43
Consumer goods	10-18, 31-32
Consumer-related services	55-56, 79, 86-93, 95-96
Metal / electric goods	24-30
Retail	47
Transport / logistics	49-53
Wholesale	46

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