Creditreform
Rating Agentur

CORPORATE BONDS IN GERMANY

AN EMPIRICAL STUDY
BY CREDITREFORM RATING AG

SEPTEMBER 2013

Management Summary

In recent years, Germany has been registering an increased activity on its national bond market. It may be too early to diagnose a structural shift from bank-based to market-based financing, but it can no longer be ignored that – in the wake of the financial crisis from 2007 to 2009 – especially medium-sized companies have been increasingly looking to meet their financial needs by selling corporate bonds.

At the same time, the relative lack of transparency on the German bond market is remarkable. In particular, with regard to certain fundamentals and structural information of bond issuers, the German bond market is rather non-transparent. This study therefore aims to analyze the development of the German corporate bond market and its issuers in closer detail, helping to increase the current levels of transparency by providing a benchmark for the German market for corporate bonds.

The market currently comprises roughly 500 bonds that have been issued by 236 non-financial corporations. Fewer than half of these companies are so-called large caps (44.9 %) which are nevertheless responsible for the majority of all issues (67.2 %). Large cap bonds also account for the bulk of the outstanding volume of German corporate bonds, i.e. approx. EUR 221.7 billion out of a total of approx. EUR 228 billion. Mid cap bonds have a total outstanding volume of approx. EUR 6.1 billion.

The number of annual bond issues has climbed in recent years, from 69 in 2009 and 68 in 2010 to 84 in 2011 and 120 in 2012. This trend has continued in 2013 with 68 corporate bond issues in the first six months. Meanwhile, the average coupon of large cap bonds has fallen from 5.500 % in 2009 to 2.750 % in 2012, while the average coupon of mid cap bonds has increased over the same period from 6.175 to 7.250 %.

An inquiry into the risk-bearing capacities of the issuers based on data from their annual statements reveals significant differences between large caps and mid caps. It shows that mid caps have lower levels of equity and a higher proportion of short-term liabilities than large caps and that they operate at lower levels of profitability, too. However, the differences between mid caps and large caps are not disproportionately large. Short-term liabilities were settled with the funds acquired through the bonds, allowing the mid caps to improve their debt structure. The profitability indicators also moved in the right direction while the debt

servicing capacities appeared to have remained stable. The recent financial ratios also failed to indicate any signs of an impending downturn.

Out of 236 issuers, 14 corporations defaulted on their financial obligations – with 2012 accounting for the largest number of defaults (8). Based on the figure of 14 defaults over a period of four years, the one-year default rate equals 1.48 %. Without the issuers from the renewable energies industry, the default rate falls to 0.74 % which is lower than the average default rate of all corporations in the economy as a whole (0.77 %).

Table of Contents

LIST OF FIGURES

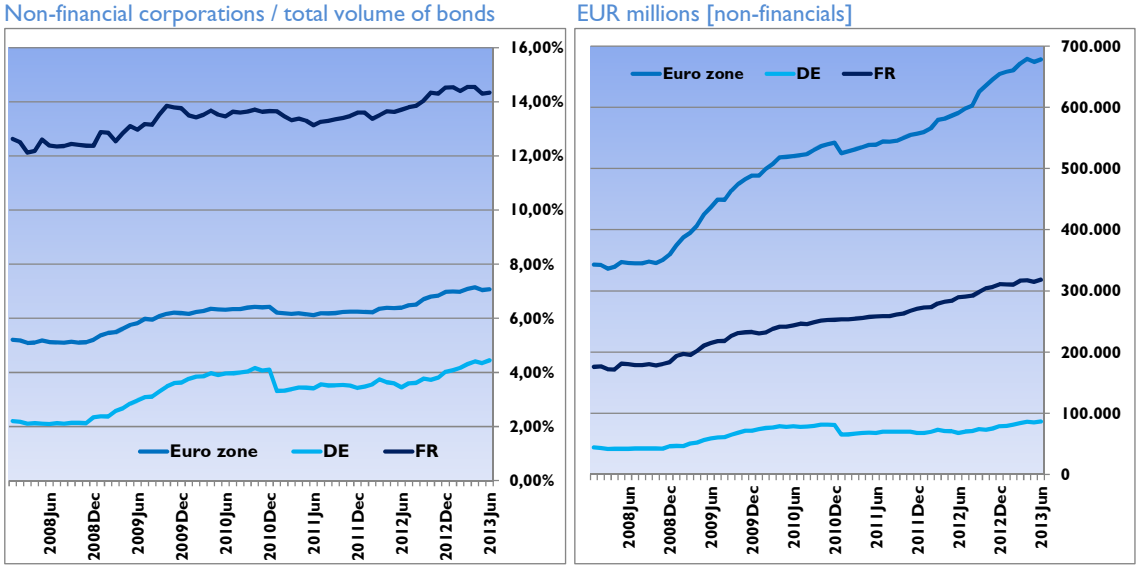
1. Introduction

The European bond market has undergone a highly dynamic development since the start of the past decade. In 2012, Euro-denominated long-term bonds (issued within the Eurozone, either by corporations or public institutions) reached an outstanding volume of EUR 13.53 trillion, equivalent to 142.6 % of the Eurozone's GDP – a significant increase from 2002 when the respective figures had been EUR 6.76 trillion and 92.1 %.

There are, however, large differences between individual countries of the Eurozone (see Fig. 1). Whereas in Germany, the total amount outstanding of Euro-denominated long-term debt securities (fixed-rate issues) that had been issued by non-financial corporations was approx. EUR 86.4 billion in 2012, the volume of such bonds reached a total of approx. EUR 318.2 billion in France. In Germany, bonds issued by non-financial companies accounted for 4.4 % of the entire bond market – in France, the figure was 14.3 % (average of the Eurozone: 7.1 %).

Figure 1: Volume of the German corporate bond market

Amounts outstanding of Euro-denominated long-term debt securities (fixed-rate issues)
Non-financial corporations / total volume of bonds | EUR millions [non-financials]



Source: European Central Bank

Traditionally, the German economy has been characterized by a bank-based financing system. Non-financial companies generally prefer to cover their financial needs through loans rather than market-based financing – a phenomenon which reflects the "small-scale structure" of the German economy with its large number of small and medium-sized companies. Nevertheless, financial globalization, the integration of financial markets and increasing competition on these markets have caused new trends in corporate financing (see also Deutsche Bundesbank

Monthly Bulletin, January 2012). Bank loans have systematically lost market share over the past 20 years, being increasingly replaced by loans within the corporate segment. At the same time, German companies make increasingly use of the bond market. While it may be too early to diagnose a "structural shift" from bank loans to corporate bonds, the demand for bonds from medium-sized companies has grown strongly in the wake of the financial crisis (2007 to 2009).

External financing structures and behaviour patterns of the market participants may be changing. However, the corporate bond market in Germany will not automatically assume the size and importance of the corporate bond market in other countries – such as the US. Well-functioning capital markets require high levels of transparency and liquidity. Information efficiency above all is a sine qua non in order to attract market participants and to create liquidity.

In the preparations for our analysis of the German bond market, we identified a huge deficit in market transparency. Financial market investors, however, require a benchmark for German corporate bonds – not only for medium-sized enterprises, but also for large corporations. The German market for corporate bonds, meanwhile, provides relatively little transparency as far as fundamentals and structural characteristics of the issuers are concerned.

This study therefore aims to analyze the development of the German corporate bond market and its issuers, helping to increase the current level of transparency. Potential issuers and investors must be provided with information – they require a benchmark. This analysis of the German corporate bond market seeks to establish just such a benchmark. In contrast to other analyses, we shall therefore not focus on an analysis of bond yields or price developments but rather on a characterization of the bond markets and the issuers.

As a preparation for the analysis, we created a comprehensive database which features – in addition to data about the volumes and the maturities of the individual issues – a wide range of relevant information about the currently outstanding corporate bonds in Germany and their issuers (annual statements and structural information). This database is being continuously updated to reflect every new issue and its respective issuer. The study in its present form covers all outstanding bonds as per 30 June 2013 that have been issued by a non-financial German company, that are denominated in Euro and that are traded on a stock exchange. Whether or not a corporate bond qualified as being "German" was determined by

the corporate headquarters of the issuer and the country code of the International Securities Identification Number (ISIN). Assessments of the risk-bearing capacity of the issuer were based on annual statements, business reports and prospectuses, while data about the corporate bonds were taken from the websites of the German stock exchanges involved (Frankfurt, Stuttgart, Düsseldorf, Hamburg-Hannover, Berlin and Munich). We are planning to extend the database in the near future to include the entire European bond market – this study will focus exclusively on the German corporate bond market.

2. The German bond market – An overview

In this chapter, we will describe the corporate bond market in Germany. First of all, we need to distinguish between large companies and medium-sized enterprises. There are, as we shall demonstrate in the following, important structural differences concerning both the volumes and the nominal interest rates of their issues. Equally, however, there are also fundamental discrepancies between large and medium-sized companies in terms of their different ways of accessing and utilizing the bond market: due to their size and legal form, medium-sized enterprises have traditionally had fewer opportunities of acquiring funds on the capital market, which is why they have preferred to cover their financial needs through bank loans. This is why many studies about the development of yields and prices on the German bond market may have failed to register some trends and developments, specifically if they involved medium-sized companies.

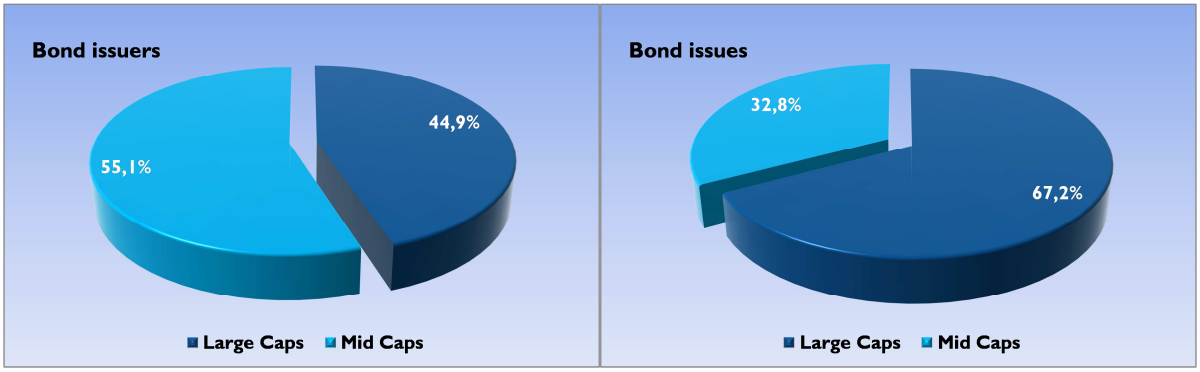
This study differentiates between different issuers of bonds according to their size, i.e. between large market capitalizations ("large caps") and medium-sized enterprises ("mid caps"). Our definition of "medium-sized enterprises" is slightly broader than the definition which is used by the European Commission. Following the EU Commission's definition of "small and medium-sized enterprises" (SME), a medium-sized enterprise employs a workforce of 50 to 250 people and either generates annual sales of EUR 10 to 50 million or discloses an annual balance sheet total of EUR 10 to 43 million. We believe that, for the purposes of our analysis of the German corporate bond market, a broader definition is required. We shall therefore classify every company as a "large cap" that has a balance sheet total of EUR 500 million or more, broadening the "mid cap" category to include all companies with balance sheet totals of less than EUR 500 million.

The German bond market currently features 500 bonds (as per 30 June 2013) that have been issued by non-financial corporations. 130 out of the total of 236 corporate issuers were mid caps. This means that less than half of the issuers are large caps (44.9 %), but these large caps were responsible for the majority of issues (336 or 67.2 %; see Fig. 2).

The overall German economy currently features approx. 15,000 economically relevant companies with a balance sheet total of at least EUR 20 million. Most of these companies (91.9 %) are mid caps. In view of this large number, the number of bond issuers appears surprisingly small – and illustrates both the under-utilization and the enormous potential of

the bond market, large caps as well as mid caps having so far made only limited use of market-based financing instruments.

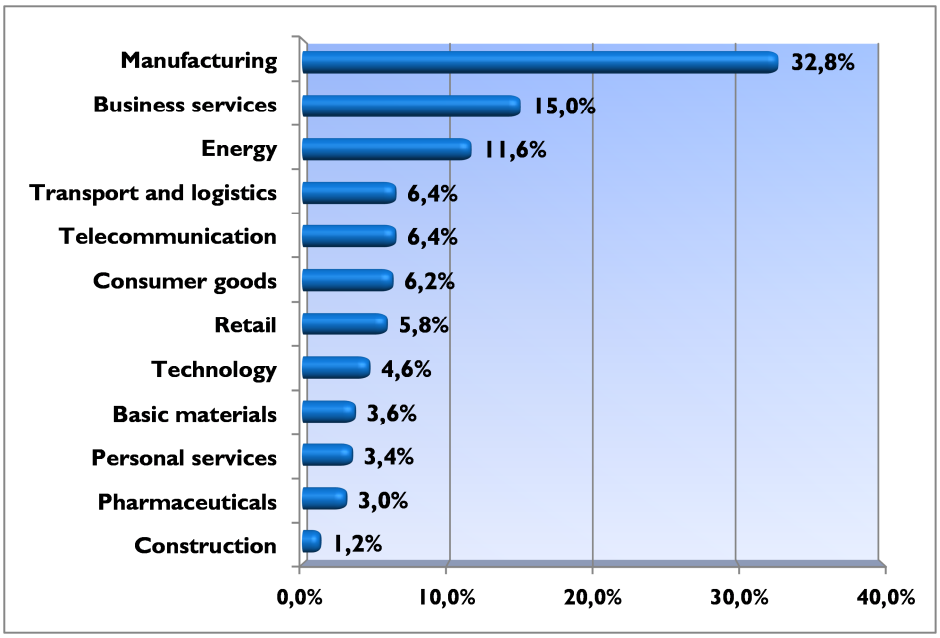
Figure 2: Bond issues and their issuers in Germany



A further differentiation within the group of the mid caps is required. Transparency levels vary between bonds of mid caps that are traded on a regulated market and those that are sold over the counter. Since 2010, several stock exchanges in Germany – Düsseldorf (the Mittelstandsmarkt), Frankfurt (Entry Standard), Hamburg-Hannover (Mittelstandsbörse Deutschland), Munich (m:access) and Stuttgart (Bondm) – have provided opportunities of issuing bonds with relatively small volumes. If the mid caps are publicly listed, comprehensive documentation obligations and the provision of a rating from an independent rating agency allow an assessment of the company's financial strength and solidity. The listed issuers are also obliged to publish certain data that are relevant for the further development of the bond's market price. For mid cap bonds that are sold over the counter on unregulated markets, conversely, the required level of transparency is relatively low. 70 issues – 53.8 % of all mid cap issues – are currently listed on a regulated market.

Manufacturing corporations have developed a specific interest in bonds (see Fig. 3). The manufacturing sector of the German industry is dominated by companies from the automotive and chemical industries, mechanical engineering and metal construction. One third of all outstanding bonds (32.8 %) have been issued by manufacturing corporations – the automotive industry alone accounts for 14.0 % of issues. Another group with a strong representation features the providers of business services (including property management, legal advice, business consultants, advertising and market research etc.) with a proportion of 15.0 % – 6.2 % of all bonds have been issued by real estate companies.

Figure 3: Bond issues by industry



The total outstanding volume of German corporate bonds (non-financials) amounts to approx. EUR 228 billion, including large cap bonds of approx. EUR 221.7 billion and mid cap bonds of approx. EUR 6.1 billion (see Fig. 4). The average emission has a volume of EUR 456 million (median value: EUR 350 million). Large cap bonds have a far higher average volume (EUR 659.9 million) than mid cap bonds (EUR 37.1 million). The difference of their respective median volumes is similarly high (EUR 500 million to EUR 25 million).

Figure 4: Large caps vs. mid caps

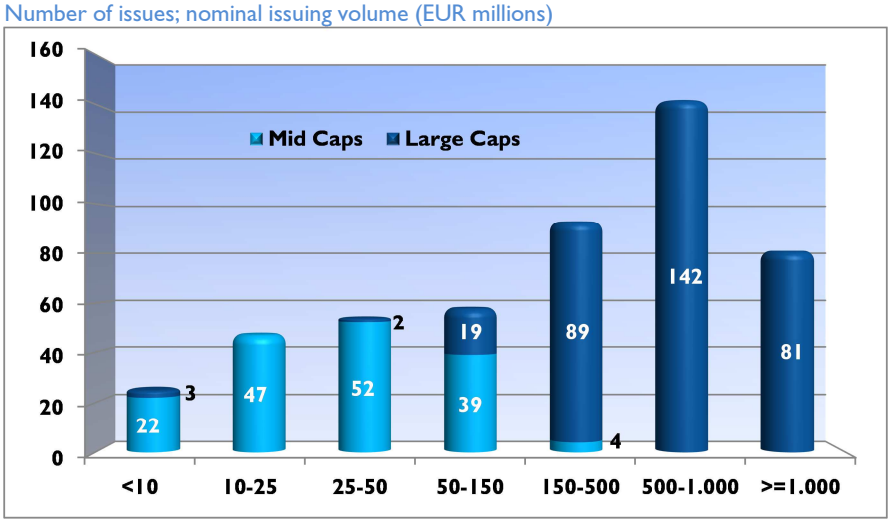
Nominal issuing volume, EUR millions

	Large Caps	Mid Caps
Minimum-Maximum	3,9 - 2.500	1,0 - 480
Average	659,9	37,1
Total	221.741,1	6.084,3

It should be noted, that 44.6 % of all bonds have a nominal issuing volume of at least EUR 500 million. A further 18.6 % fall into the range between EUR 150 and 500 million (see Fig. 5). The establishment of markets that are designed to meet the requirements of medium-sized companies (see above) have allowed new segments to emerge with volumes of less than EUR 150 million. Mid cap bonds commonly have volumes of less than EUR 50 million – although several mid cap issues with volumes of EUR 50 to 150 million have been placed over recent years.

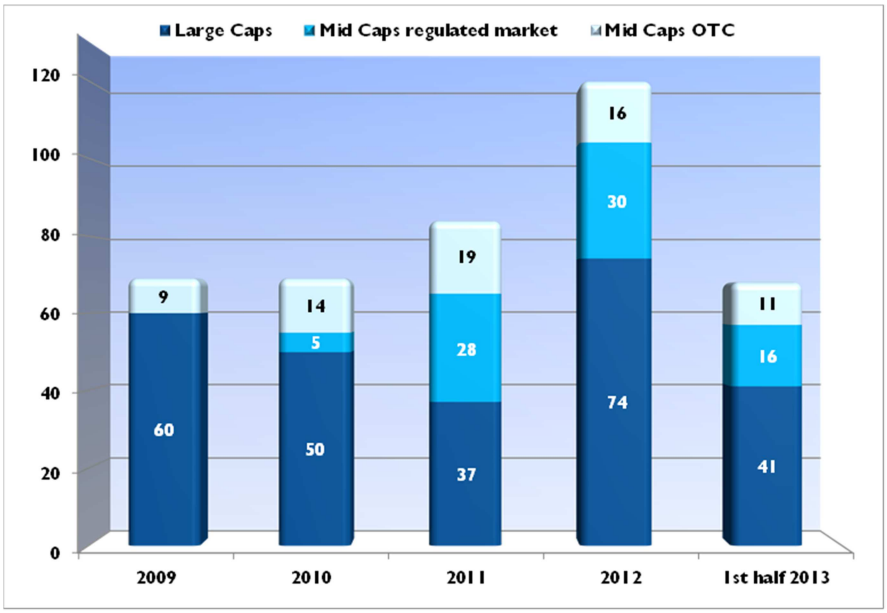
Figure 5: Prospective volumes of bond issues

Number of issues; nominal issuing volume (EUR millions)



Since 2010, the number of corporate bond issues in Germany has risen: from 69 and 68 in 2009 and 2010 to 84 in 2011 (see Fig. 6) and 120 in 2012. In the first six months of 2013, 68 such bonds have been issued – over 50 % more than the number for the same period of the previous year. This may indicate a permanent change in the structure of corporate bond issues in Germany. It appears that the issue of mid cap bonds – specifically on regulated markets – is becoming a more attractive option. While the trend of large cap issues pointed downward from 2009 to 2011, the issue of mid cap bonds has been gradually gathering speed since 2009.

Figure 6: Development of corporate bond issues

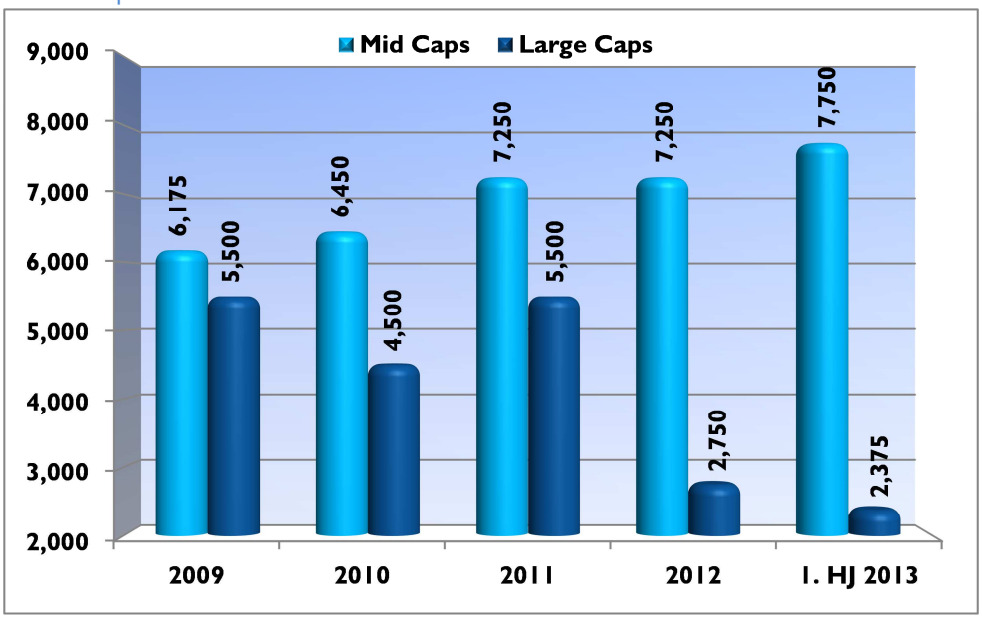


*) Regulated market ⇔[Entry Standard, Bondm, der mittelstandsmarkt, m:access, Mittelstandsbörse Deutschland]

The rising number of bonds that have been issued by non-financial corporations and the increasing importance of mid cap bonds have been caused by a range of factors which are not mutually exclusive. It appears that the overall improving economic outlook had a positive effect on risk perceptions in the business world and the demand for corporate bonds. Furthermore, as a consequence of stricter capital requirements of the latest Basel regulations, companies are more likely to consider alternative financial arrangements, since the credit institutions need to reduce their exposure to loans. Substitution effects between bank-based and market-based external financing arrangements may equally have been involved. Even companies of relatively good financial strength – which are not affected by the restrictions implemented by their banks in the pursuit of stricter lending policies – appear to show a growing interest in broadening their credit base and in reaping the benefits of external financing through the issue of a bond (such as a lower collateralization and a broader investor base). All enterprises, but specifically mid caps appear to be generally more open to the idea of covering their financial needs by going to the capital markets than they were a few years ago. The increased demand of investors may also have been caused by an increasing risk appetite and by yield spreads between corporate bonds and other asset classes including government bonds. The generally low level of interest rates and the monetary policies of most Western governments may have led investors who are in search of high-yield asset classes to consider the higher risks of corporate bonds.

Figure 7: Development of the nominal interest rate

Median coupon value in %

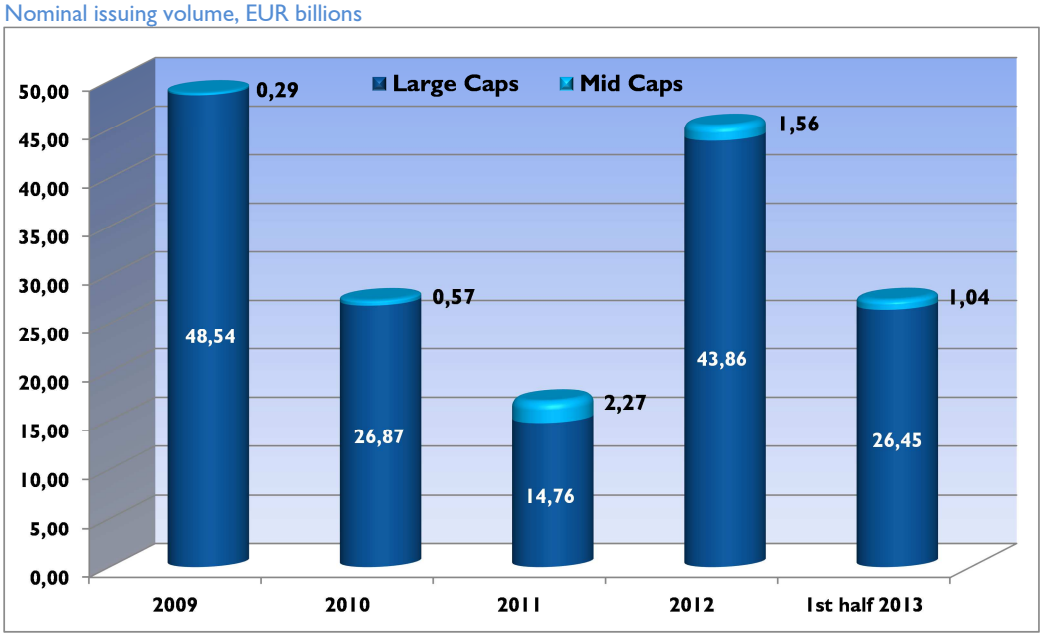


The median coupon value of a mid cap bond rose from 6.175 % in 2009 to 7.250 % in 2012 (see Fig. 7). The nominal interest rates of German mid cap bonds have developed very differently from the interest rates of large cap bonds: the average coupon of large cap bonds fell from 5.500 % in 2009 to 2.750 % in 2012. In the first six months of 2013, the interest margin increased further when the average coupon for large caps fell to 2.375 % while the average mid cap bond carried a coupon of 7.750 %.

The issuing volume of Euro-denominated corporate bonds in Germany fell significantly from EUR 48.8 billion in 2009 to EUR 17.0 billion in 2011 (see Fig. 8) before rebounding strongly in 2012 (EUR 45.4 billion). In the first half of 2013, bonds with a total volume of EUR 27.5 billion were issued – 60 % of the previous year's entire volume. The falling level of issuing volumes in 2010 and 2011 mainly reflected a drop in large cap bonds. In 2011 large cap bonds accounted for 44.0 % of all issues, down from 87.0 % in 2009.

Figure 8: Development of issuing volumes on the corporate bond market

Nominal issuing volume, EUR billions

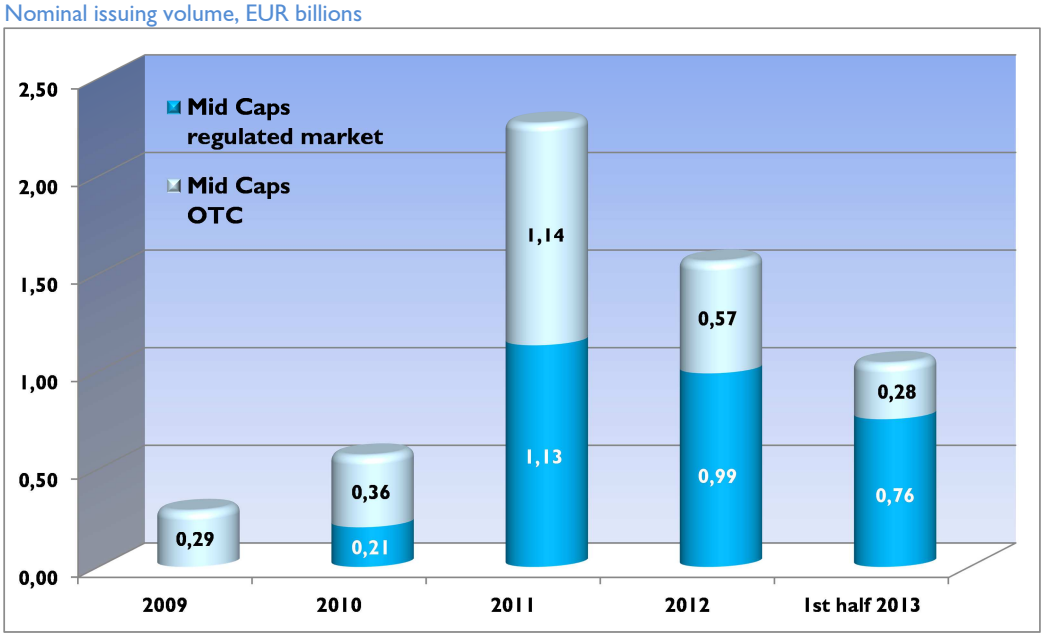


So far, the market for mid cap bonds reached its highest point in 2011 (see Fig. 9), when bonds with a total nominal value of EUR 2.27 billion were issued. In 2012, the issuing volume fell to EUR 1.56 billion, but will probably be exceeded in 2013 after bonds with a volume of EUR 1.04 billion were issued in the first six months. It is also noteworthy that the proportion of mid cap bonds that have been issued on a regulated market is further increasing. Whereas mid cap bonds that had been issued on an unregulated market accounted for roughly half the volume of the entire mid cap segment in 2011, this proportion has dropped to about 25 % in

the first six months of 2013. This appears to indicate an increasing level of acceptance for the newly created markets in Frankfurt, Stuttgart, Düsseldorf, etc. – from both issuers and investors.

Figure 9: Development of issuing volumes in the mid cap segment

Nominal issuing volume, EUR billions



3. The financial risk-bearing capacities of the issuers

An increase in the demand for market-based external financing requires more than knowledge about the market conditions and the structural features of the issuers. The opportunities of corporate funding that are provided by the bond market will – in the long run – only be seized if clear standards for an assessment of the issuers' levels of financial strength are in place. Under the current circumstances, however, a transparent development of financial ratios, which provide information about the financial strength and the risk-bearing capacity of the enterprise in question, is the exception rather than the rule. Different issuers are also free to interpret financial ratios in different ways, making meaningful comparisons essentially impossible.

In the following, we analyze the derivation of the financial ratios that are relevant for an assessment of corporate risk-bearing capacity. Depending on the segment to which the issuer under review belongs (large cap or mid cap), financial ratios indicating the capital structure, profitability and financial strength will be analyzed (for a definition of the financial ratios, see the Appendix). The basis for the analysis was provided by data from annual statements and securities prospectuses of the issuers. In order to ensure the statistical comparability of these annual statements (and securities prospectuses), the balance sheet information in question was structured, standardized and adjusted for any inherent biases of the accounting system in use.

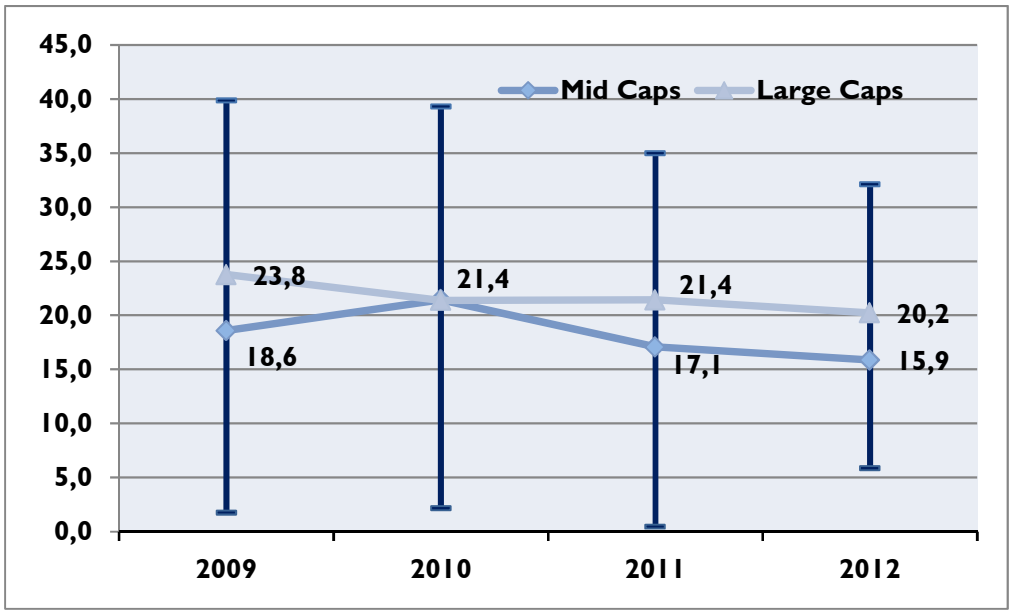
One of the key indicators for a company's risk-bearing capacity is the equity ratio. In principle, the higher the share of equity in the company's total capital, the more solid the financial foundation, since a high equity ratio improves the company's liable equity basis, ensures high levels of independence from its creditors and enhances the liquidity position. The equity ratio is calculated by dividing the adjusted equity by the adjusted balance sheet total (for a more detailed explanation, see the Appendix).

Between 2009 and 2012, the median equity ratio of large caps fell from 23.8 to 20.2 % (see Fig. 10). The equity ratio of mid caps decreased even a little further over the same period (from an average of 18.6 % in 2009 to 15.9 % in 2012), although the downward trend was not steady from year to year. This probably reflects the significant increase of balance sheet totals during this period – largely a consequence of bond issues – from an average value of EUR 35.3 million (2009) to EUR 107.8 million (2012). The fall in the average equity ratio of bond-

issuing, non-financial corporations – independently of their size – generally reflects the effects of the bond issue on their balance sheets (i.e. the increase in borrowed funds).

Figure 10: Equity ratio of mid cap and large cap bond issuers

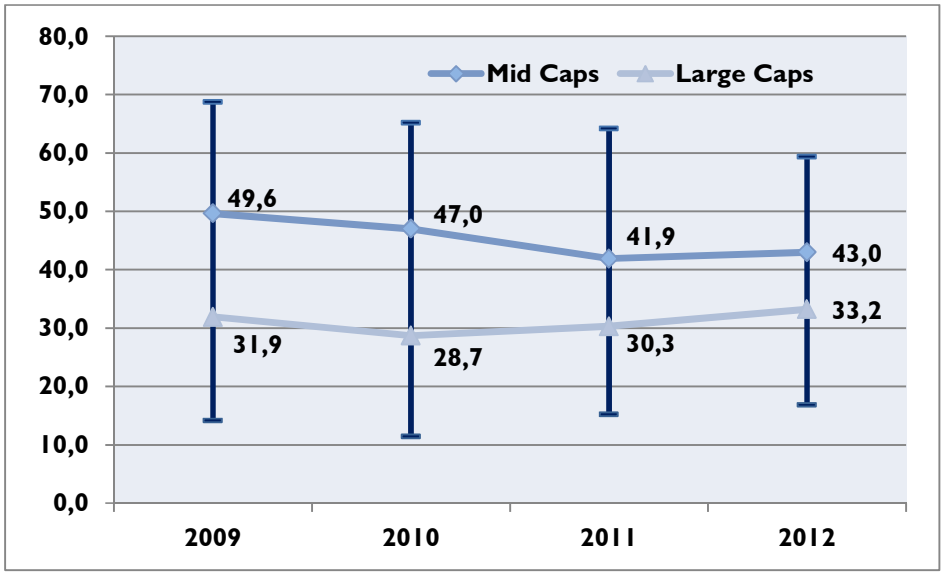
Median values and 20/80 % percentiles (in %)



The analysis of the annual statements also shows that the bond issuers succeeded in reducing their short-term debt. In principle, it is assumed that there is a direct connection between the safety of a company's financial arrangements and the length of time for which the borrowed funds are available. If much of the debt is characterized as "short-term", the financial risk is proportionately higher, because short-term debt must be redeemed in the near future and requires adequate liquidity that may not be always available. A high proportion of short-term debt also increases a company's default risk, since short-term refinancing deals – that may be required to redeem the maturing debts – can prove hard to arrange. The "debt structure", i.e. the proportion of short-term liabilities – comprising trade accounts payable, liabilities from bills of exchange and liabilities from bank loans – of the overall debt has fallen for the mid caps from an average of 49.6 % (2009) to 43.0 % (in 2012) (see Fig. 11). This appears to indicate that the gap between large caps and mid caps is narrowing down. Over the same period, the proportion of short-term liabilities in the overall debt of large caps increased, albeit slightly, from 31.9 to 33.2 %.

Figure 11: Debt structure of companies from different size categories

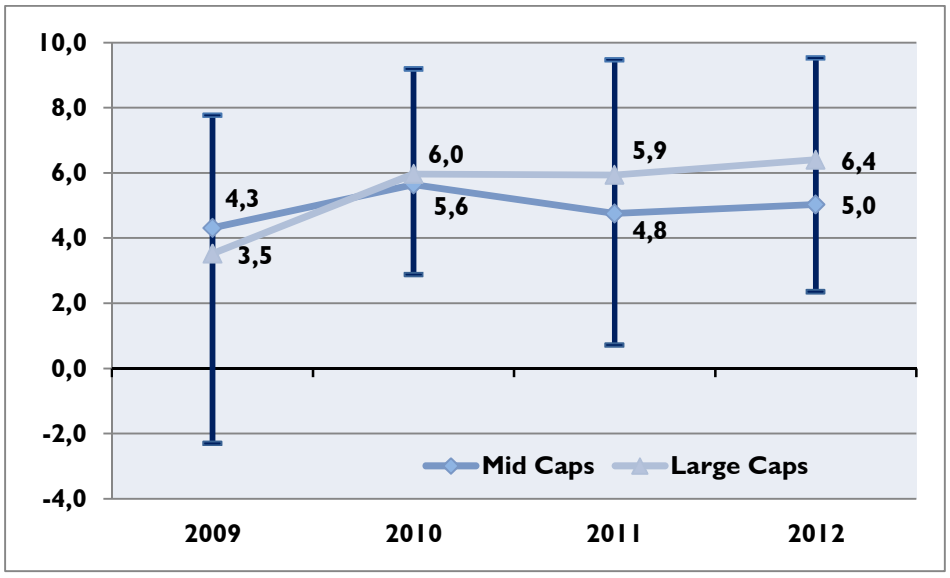
Median values and 20/80 % percentiles (in %)



The earning power of the bond issuers improved during the period covered by the analysis. The development of both the return on assets and the EBIT margin indicates higher levels of profitability. The return on assets (ROA) identifies the return that has been generated by the company's total capital. It is calculated by dividing the annual net profit plus interest on debt by the adjusted balance sheet total. An increasing ROA indicates the growing capacity of the company to use its available funds efficiently for the generation of sustainable profits.

Figure 12: Return on assets – mid caps and large caps

Median values and 20/80 % percentiles (in %)

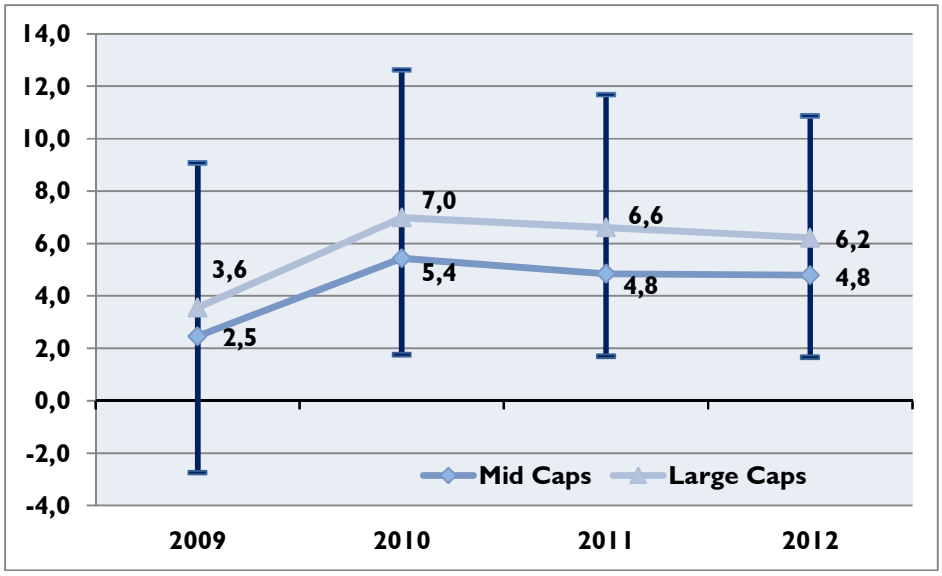


Overall, large caps are more profitable than mid caps. They managed to increase their annual return on assets from 5.9 % in 2011 to 6.4 % in 2012, a significant improvement of the 4.3 % figure from 2009 (see Fig. 12). The average return on assets of the mid caps rose slightly to 5.0 % in 2012 from 4.8 % in 2011.

The analysis of average EBIT margins confirms the higher profitability of the large caps (see Fig. 13). The "EBIT margin" (⇔ return on sales) identifies the surplus that was generated from the total sales revenue. The return on sales equals the operating profit divided by the total sales revenue. A high EBIT margin indicates a good earnings potential for the operating business. In 2012, the large caps operated with an EBIT margin of 6.2 % (2011: 6.6 %), in contrast to only 4.8 % for the mid caps (2011: 4.8 %).

Figure 13: EBIT margin of mid caps and large caps

Median values and 20/80 % percentiles, in %



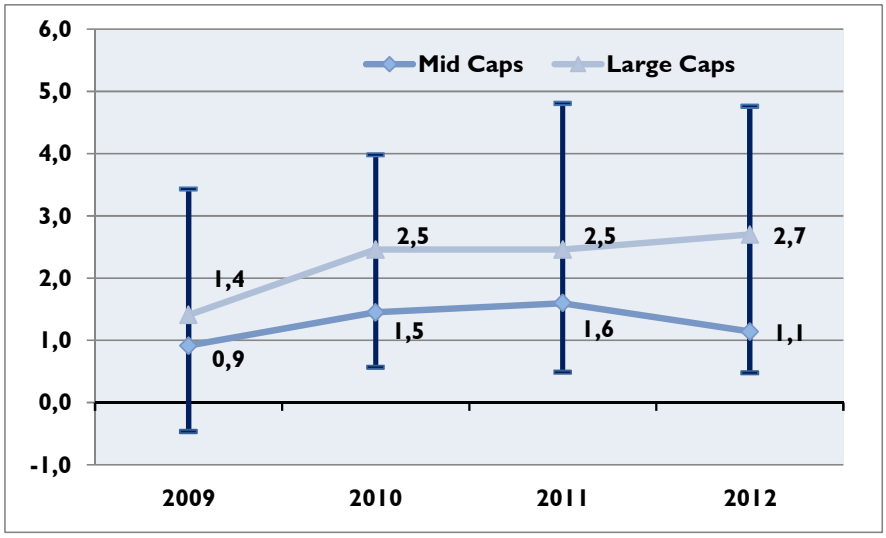
The EBIT-interest coverage ratio shows to what extent the interest rate expenses of the bond issuers are covered by their operating results. It is calculated by dividing operating profits by interest paid. When borrowing costs are rising, low EBIT-interest coverage rates show that the pressures on the returns are increasing and indicate a higher risk that the company in question may become incapable of meeting its interest rate payment obligations.

Until 2011, both large caps and mid caps experienced a period of improving EBIT-interest coverage rates (see Fig. 14). Between 2009 and 2012, the coverage ratio for the large caps increased from 1.4 to 2.7, whereas for the mid caps it rose from 0.9 in 2009 to 1.6 in 2011. In the past year, however, it fell to 1.1. Taking into account the current levels of bond yields, the

interest rate coverage ratios could be expected to drop. The upward trend of both large caps and mid caps (until 2011) is a positive sign, inasmuch as it indicates that the increases in interest rate expenses were probably more than offset by improved results.

Figure 14: EBIT interest coverage – large caps and mid caps

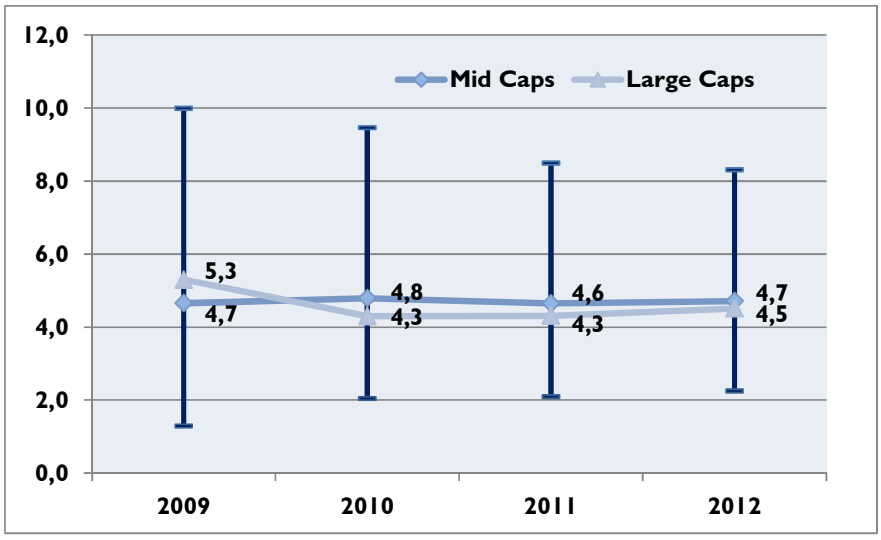
Median values and 20/80 % percentiles



The ratio between net liabilities and EBITDA showed little change during the period under review. This financial ratio allows assessments of the bond issuer's debt-servicing capacity, expressing the ratio between the figure for total debt minus advance payments received, trade accounts payable and liquid funds on the one side and EBITDA on the other. The lower the value, the better the company's prospects of being able to redeem its debt.

Figure 15: Net debt / EBITDA – mid caps and large caps

Median values and 20/80 % percentiles



The net debt/EBITDA ratio is roughly similar for large caps and mid caps (see Fig. 15). The values for both large caps and mid caps in 2012 were slightly higher than for the previous year, rising from 4.3 and 4.6 respectively in 2011 to 4.5 and 4.7 in 2012. The gap between large caps and mid caps is far narrower than it is for the EBIT interest coverage rate (which is calculated on the basis of corporate earnings before interest and taxes).

The risk-bearing capacities of mid cap issuers therefore appear to be smaller than those of their large cap peers. Mid caps have lower levels of equity, higher ratios of short-term debt and lower levels of average profitability. The differences between mid caps and large caps, however, are not disproportionately large. Short-term debts could be settled, using the proceeds from the bonds: this had positive effects on the debt structure. The financial ratios that indicate the levels of earning power are equally identifying positive or stable trends while the financial ratios that allow assessments of a company's debt-servicing capacity are roughly unchanged. Hence, current business development figures fail to display any signs for an impending downturn.

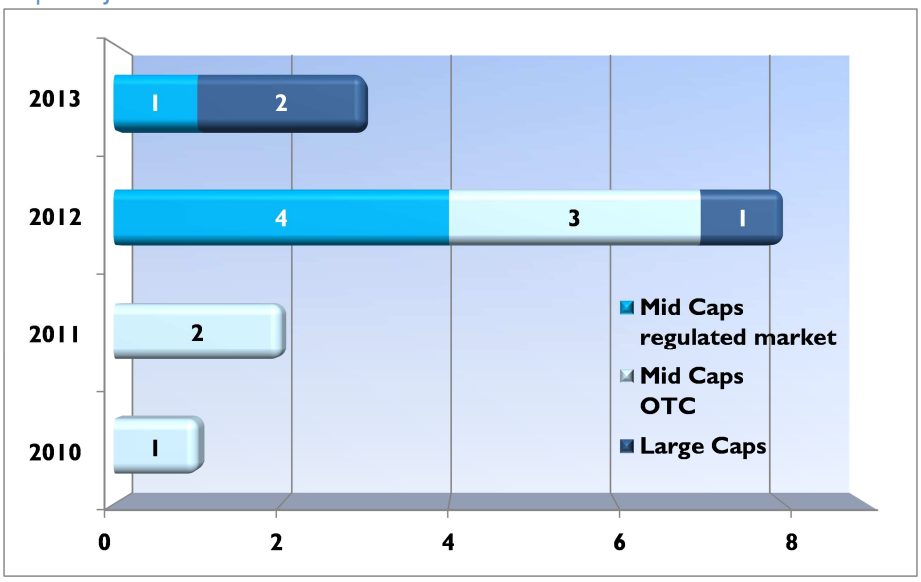
4. Defaults of German bond issuers

Following the definitions of the Basel Committee on Banking Supervision and the Deutsche Vereinigung für Finanzanalyse und Asset Management (DVFA), a company is considered to be in default when (i) Creditreform Rating AG assumes that the company in question shall with great probability no longer be able to meet its debt-servicing obligations without creditors, investors or banks taking recourse to the collateralized assets; or (ii) (at least) one major financial obligation of the borrower to its creditors, investors or banks is in arrears of more than 90 days (for more details, see the Appendix).

Out of the total of 236 bond issuers, companies had gone into default (as per 30 June 2013). The largest number of defaults in any single year (within the period under review) occurred in 2012 (8). Eleven out of the 14 defaulting companies were mid caps (whose bonds had been issued either on regulated or unregulated markets) (see Fig. 21).

Figure 16: Defaults of bond issuers

As per 30 June 2013



Nevertheless, this finding must be further qualified with special reference to the industries involved. Firstly, it cannot come as a major surprise that the mid cap segment counts a larger number of companies in default since investments in mid cap bonds are generally considered to bear higher risks than investments in large cap bonds, a fact which is also reflected by the gap in the respective bond yields. A more differentiated picture emerges when the question on which type of market the defaulted mid cap issuer has been trading its bonds – regulated markets (five defaults) or over the counter markets (six defaults) – is also taken into account.

Above all, however, it is important to note that it is not the mid cap market segment as such (or the market for mid cap bonds) which is subject to an increased default risk. Closer scrutiny reveals that specific industries were over-represented in the group of defaulting companies, mainly the Energy and the Business Services industries with seven and three defaults respectively. The defaulting energy companies all belonged to the renewable energies market segment. Mid cap issuers include many solar energy project companies and companies from the photovoltaic industry – an industry which, while certainly not being immune from management errors, has been faced with an array of challenges such as unexpected structural changes and subsidy cuts, the rapid fall in the prices of photovoltaic modules and the emergence of new competitors from non-EU countries.

Based on the figure of 14 defaults over a period of four years, the one-year default rate equals 1.48 %. Without the issuers from the renewable energies industry, the default rate falls to 0.74 % which is even lower than the 2012 default rate of all economically relevant businesses in the economy as a whole, with a balance sheet total of at least EUR 20 million (0.77 %).

5. Conclusions

The latest trend towards an increased demand for corporate bonds by the mid cap segment – a segment which is the backbone of the Germany economy – is in need of further support. The opportunities that are provided by newly established regulated markets such as the Entry Standard in Frankfurt or the Bondm in Stuttgart will only be exploited in the medium and long term when issuers and other participants on the financial markets have decided that the conditions on these markets are clear and transparent. Participants on the market for external financing require not only knowledge about the market conditions and the structural features of the issuers, but also information about the financial strength of the issuers.

Creditreform Rating AG has compiled a comprehensive database which features structural financial information about the issues as well as relevant fundamentals about the currently outstanding German corporate bonds including their issuers. The fundamentals on which this study has been based have so far not been available in a sufficiently transparent form. The database will be continuously updated with information about every new issue and its issuer.

This study has demonstrated that the German corporate bond market, while it may have grown in size – specifically on the strength of an increase in mid cap issues –, still has many remaining deficits to address before it can catch up with other markets around the world. At the same time, the German bond market provides an enormous potential for all market participants, issuers as well as investors.

Recently, critical observers have identified some warning signs for "increased risks" on the German market for corporate bonds, citing mainly the growing number of defaults in the mid cap segment. Our differentiated analysis of the financial ratios and the defaults has demonstrated that the market for mid cap bonds may still be in a stage of development but that no "downward trend" towards less solid financial arrangements can be reasonably identified.

This is not to say that the financial strength of certain individual issuers had not deteriorated or that structural changes were not exerting pressures on the renewable energies industry. Nevertheless, the development of the financial ratios during the period between 2009 and 2012 provides no evidence for the assertion that the overall financial risk-bearing capacity of the issuers under review had declined. On the contrary: the earning power ratios are indicating positive or stable trends.

Appendix

Definition of the financial ratios

Equity ratio (%) =	$\frac{\text{Adjusted equity}}{\text{Adjusted balance sheet total}}$	x 100
EBIT interest coverage =	$\frac{\text{Operating profit}}{\text{Interest and similar expenses}}$	
EBIT margin (%) =	$\frac{\text{Operating profit}}{\text{Sales revenue}}$	x 100
Debt structure (%) =	$\frac{\text{(Trade accounts payable + notes payable + bank debt)}}{\text{Total debt}}$	x 100
Return on assets (%) =	$\frac{\text{(Annual profit+ interest on debt)}}{\text{Adjusted balance sheet total}}$	x 100
Total net debt / EBITDA =	$\frac{\text{(Debt – trade accounts payable – advance payments received – liquid funds)}}{\text{(Operating profits + depreciations)}}$	

Adjusted equity	Nominal capital, capital account I + Capital account II - Subscribed capital unpaid + Capital in excess of par value (reserves) + Legal reserves / reserves for business partnerships - Expenses for start-up and expansion of business activities and for equity procurement - Capitalized goodwill - Own-produced intangible assets - Other adjustment items in the context of reclassifying IAS(IFRS)-/US-GAAP positions (EQ) - Debt discounts - Deferred tax assets + Deferred tax liabilities + Allowances / subsidies (incl. 2/3 construction cost allowances / subsidies) + Provision for expenditures + 1/2 special reserve + Deferred item for the consolidated statement

	+ Liabilities to shareholders with equity-substituting features (subordinated claims) + Profit-participating certificates + Minority equity interests + Other equity + Profit / - loss carried forward + Annual net profit / - net loss + Balance sheet profit / - loss
Adjusted balance sheet total	Adjusted equity +Total debt

Definition of a default

Creditreform Rating AG defines a "default" in accordance with the definitions of the Basel Committee on Banking Supervision and the German Association for Financial Analyses and Asset Management (the *Deutsche Vereinigung für Finanzanalyse und Asset Management* / DVFA).

A company or an issuer is therefore considered "in default" when at least one of the following two criteria has been met:

- Creditreform Rating AG assumes that the company / the issuer in question shall with great probability no longer be able to meet its debt-servicing obligations without creditors / investors / banks taking recourse to the collateralized assets.
- (At least) one major financial obligation of the borrower to its creditors / investors / banks is in arrears of more than 90 days. Liabilities are considered "in arrears" when the company / the issuer has exceeded the agreed maximum payment period.

Indications of an impending insolvency include (but are not limited to) the following:

- Creditors / investors / banks have temporarily waived (deferred) their right to enforce interest rate payments (interest rate moratorium)
- Creditors / investors / banks have sold the credit agreement with a substantial loss on their investment which reflects the debtor's loss of financial strength
- Creditors / investors / banks have agreed to an inevitable restructuring programme which causes the debt to be reduced (by writing off claims or deferring payment)
- Creditors / investors / banks have filed applications for the opening of insolvency or similar proceedings (in connection with the debt in question)
- The company / the issuer itself has filed an application for insolvency
- A Creditreform credit rating report has stated that the Index of Financial Strength of the company / the issuer has been changed to 600 (= insolvency)

Bond issuers (overview)

3W Power S.A.
A.C.M. Innovations GmbH
A.T.U Auto-Teile-Unger Handels GmbH & Co. KG
ACAZIS AG
Activa Resources AG
adidas AG
ADLER REAL ESTATE AG
Adolf Würth GmbH & Co. KG
Air Berlin PLC
ALBA Group plc& Co. KG
Albert Reiff GmbH &. Co. KG
Albis Leasing AG
ALEGRA GmbH
ALNO Aktiengesellschaft
ALSTRIA OFFICE Reit AG
ArenicoProductions GmbH
ARISTON Real Estate AG
Asklepios Kliniken Hamburg GmbH
AVW Grund AG
BASF SE
Bastei Lübbe GmbH & Co.KG
Bayer AG
Bayerische Motoren Werke AG
BDT MEDIA AUTOMATION GMBH
Behr GmbH & Co. KG
Berentzen-Gruppe Aktiengesellschaft
Bertelsmann SE & Co. KGaA
Bilfinger SE
BKN biostrom AG
BosTrade Businesscenter GmbH
Brenntag AG
Bridge Capital Partners GmbH
CAPEX Grundstücksverwertungsgesellschaft mbh
CARPEVIGO AG
CBI Louisbourg Resort GmbH
CCG Cool Chain Group Holding AG
Celesio AG
Centrosolar Group AG
Constantin Medien AG
Continental AG
Daimler AG

Danone GmbH
DEIKON GmbH
Deutsche Bahn Aktiengesellschaft
Deutsche Börse AG
Deutsche ETP GmbH & Co. KG
Deutsche Lufthansa AG
Deutsche Post AG
Deutsche Telekom AG
DF Deutsche Forfait Aktiengesellschaft
DIC Asset AG
Dr. Ing. h.c. F. Porsche Aktiengesellschaft
Driver &Bengsch AG
Dürr AG
e.n.o. energy GmbH
E.ON SE
Edel AG
Ekosem-Agrar GmbH
Ekotechnika GmbH
EnBW Energie Baden-Württemberg AG
Energiekontor AG
Enterprise Holdings
ESTAVIS AG
eterna Mode Holding GmbH
Eurogrid GmbH
Evonik Industries AG
EWE AG
EXER D GmbH
EYEMAXX Real Estate AG
FC Wertmanagement GmbH
FFK Environment GmbH
Franz Haniel & Cie. GmbH
Fraport AG Frankfurt Airport Services Worldwide
freenet AG
Fresenius Management SE
Freund & Partner GmbH Steuerberatungsgesellschaft
friedola Gebr. Holzapfel GmbH
Fußballclub Gelsenkirchen-Schalke 04 e.V.
gamigo AG
GEA Group AG
Gebr. Sanders GmbH & Co. KG
Georgsmarienhuette Holding GmbH
German Pellets GmbH
Gerresheimer AG

getgoods.de AG
GFK SE
GIF Gesellschaft für Industrieforschung mbH
Global PVQ SE
GOLDEN GATE AG
Golfino AG
Goodyear Dunlop Tires Germany GmbH
Grohe Holding GmbH
Günther Zamek Produktions- und Handelsgesellschaft mbH & Co. KG
GWB Immobilien AG
HAEMATO AG
Hahn-Immobilien-Beteiligungs AG
HALLHUBER Beteiligungs GmbH
Hamburger Sportverein e.V.
Hapag-Lloyd AG
HECKLER & KOCH GmbH
HeidelbergCement AG
Heidelberger Druckmaschinen AG
Hella KGaA Hueck & Co.
HELMA Eigenheimbau AG
Henkel AG & Co. KGaA
Heraeus Holding GmbH
hkw Personalkonzepte GmbH
HOCHTIEF AG
Homann Holzwerkstoffe GmbH
Hornbach-Baumarkt AG
HPI AG
HSE Netz AG
Ichor Coal N.V.
IDENTEC GROUP AG
Impreglon SE
Infineon Technologies AG
INKA Beteiligungsverwaltungs AG
IPSAK mbH
IVG Immobilien AG
Jacob Stauder GmbH & Co. KG
Joh. Friedrich Behrens AG
K+S Aktiengesellschaft
Kabel Deutschland Holding AG
Karlie Group GmbH
Karlsberg Brauerei GmbH
Katjes International GmbH & Co.KG
KION GROUP AG

Klöckner & Co SE
KlöcknerPentaplast German Holding GmbH & Co. KG
Kons.fabr.Zachow GmbH & Co. KG
KraussMaffei Technologies GmbH
KTG Agrar AG
KTG Energie AG
KUKA AG
LANXESS Aktiengesellschaft
Laurèl GmbH
Leoni AG
Linde AG
loginet3 AG
MAG IAS GmbH
MAN SE
Maritim Vertriebs GmbH
Marseille-Kliniken AG
maxingvestag
MBB Clean Energy AG
Merck KGaA
Meridian Mezzanine GmbH
Metalcorp Group B.V.
METRO AG
Metropol Immobilien Rhein-Main AG
MITEC Automotive AG
More & More AG
Mox Telecom AG
MS "Deutschland" Beteiligungsgesellschaft mbH
MS Spaichingen GmbH
MT Energie GmbH
MTU AeroEngines AG
Münchener Boulevard Möbel Joseph Duna GmbH
Nabaltec AG
Nordex SE
OBI AG
Orion Engineered Carbons Bondco GmbH
Otto (GmbH & Co KG)
Oxea Holding GmbH
PCC SE
Peach Property Group (Deutschland) AG
Peri GmbH
Peter Massine Entertainment Holding GmbH
PHOENIX Pharmahandel GmbH & Co KG
Photon Energy Investments N.V.

PIAG ProInvest Real Estate AG
PNE WIND AG
posterXXL AG
Praktiker AG
Procar Automobile Finanz-Holding GmbH & Co. KG
PROKON Regenerative Energien GmbH & Co. KG
Real Invest International GmbH
Regenbogen AG
RENA GmbH
RENÉ LEZARD Mode GmbH
Rheinmetall AG
RHÖN-KLINIKUM AG
RickmersHold.GmbH& Cie. KG
Robert Bosch GmbH
Royalbeach Spielwaren und Sportartikel Vertriebs GmbH
Rudolf Wöhrl Aktiengesellschaft
RWE AG
S&T AG
S.A.G. Solarstrom AG
SAF-HOLLAND S.A.
Salzgitter Aktiengesellschaft
SANHA GmbH & Co. KG
Sanochemia Pharmazeutika AG
SAP AG
Schaeffler AG
Schneekoppe GmbH & Co. KG
Scholz AG
Semper idem Underberg GmbH
SeniVita Sozial gGmbH
SGL CARBON SE
SIAG Industrie GmbH
SIC Processing GmbH
Siemens Aktiengesellschaft
Singulus Technologies AG
Sixt AG
Solar Millennium AG
Solar8 Energy AG
SolarWorld AG
Solen AG
STADA Arzneimittel AG
Stadtwerke Hannover AG
Steilmann-Boecker Fashion Point GmbH & Co. KG
Stern Immobilien AG

Strenesse AG
Styrolution Group GmbH
Südzucker AG
Symrise AG
TAG Immobilien AG
TAKKO Holding GmbH
Techem Energy Metering Service GmbH & Co. KG
Textilkontor Walter Seidensticker GmbH & Co. KG
ThyssenKrupp AG
Travel24.com AG
TUI AG
UnitymediaKabelBW GmbH
UNIWHEELS GmbH
Valensina GmbH
Vier Gas Transport
Vital Centrum Hodey AG
Voith GmbH
VOLKSWAGEN AG
Wepa Hygieneprodukte GmbH
WGF - Westfälische Grundbesitz und Finanzverwaltungs AG
Wienerberger AG
Windreich AG
WMA Immobilien GmbH & Co. KG