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## Key determinants of bond issue terms on the Catalyst bond market in 2009–2019

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### ABSTRACT

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The first objective of the article was to determine what makes Polish companies decide to issue bonds (instead of financing themselves with loans or other sources). The second objective was to examine the key factors determining the interest rate of bonds. The research was based on public bonds, listed on the Polish Catalyst bond market. It should be emphasised that this is the first study of this kind on the Polish bond market covering both the issue characteristics and the financial attributes of the issuers. Firstly, in order to determine which parameters have a real impact on Polish companies' issuance decisions, a probit model was created basing on parameters such as the age of the company, its size, asset growth dynamics, leverage, ROA, and investments in fixed assets.

Secondly, in order to determine what the real interest rate of the bonds depends on, using linear regression and the least squares method, we examined the key parameters that issuers could consider as leading in determining the future estimated interest rate of the bonds, such as rating, issue collateral, issue size, and maturity.

In our research we found that the size of a company and the level of its financial leverage are the main incentives for Polish companies to issue bonds. Moreover, the size of the issuer and the level of its financial leverage are the key factors determining the bonds margin.

**Keywords:** corporate bonds, Catalyst, bond pricing, Polish non-treasury bond market  
**JEL:** G10, G12, G30

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## Introduction

The Polish Catalyst bond platform was launched in 2009. It was the first organised debt securities trading system, giving high hopes of development especially in the area of non-treasury instruments. The creation of Catalyst revived the capital market and increased the interest of Polish companies in diversifying their sources of financing. The importance of enterprises' partial independence from bank loans became stronger during the subprime crisis, when banks tightened the criteria for granting loans.<sup>1</sup> The tenth anniversary of the Catalyst platform was a good opportunity to draw some interesting conclusions about the Polish bond market.

The first aim of this article was to determine the factors for choosing corporate bonds as a form of financing by Polish companies. The second aim was to examine the key factors determining the interest rate of debt securities, concerning both the issue characteristics and the financial attributes of the issuers. Focusing on debuting issuers allowed us to identify and better understand the motives that guide companies to raise capital through the corporate bond market. Although our research covered public bonds listed on the Catalyst market, it is worth noting that the Polish market for non-public (not listed) bonds is much larger, but its study is difficult due to the lack of publicly available terms of bond issue.

The authors try to prove the hypothesis that there are financial features that motivate companies to issue bonds rather than use bank loans.

## 1. Key features of the Catalyst market between 2009–2019

In 2009–2019, there were 241 bond issues of 204 non-financial companies on the Catalyst market<sup>2</sup> (this means that 15% of the bond issues were again made by the same issuers). Chart 1 shows the number of debuts between 2009 and 2019, with the first introduction of bonds to trading on the Catalyst market being considered a debut.

The macroeconomic situation and falling interest rates potentially encouraged companies to enter the bond market. The largest concentration of debuts of non-financial enterprises was in the years 2011–2014. The reasons for the decrease in the number of debuts on the Catalyst market after 2014 may have been, among others, the new requirement of the minimum value of the issue in turnover (PLN 1 million), the need to adapt to the new provisions of the

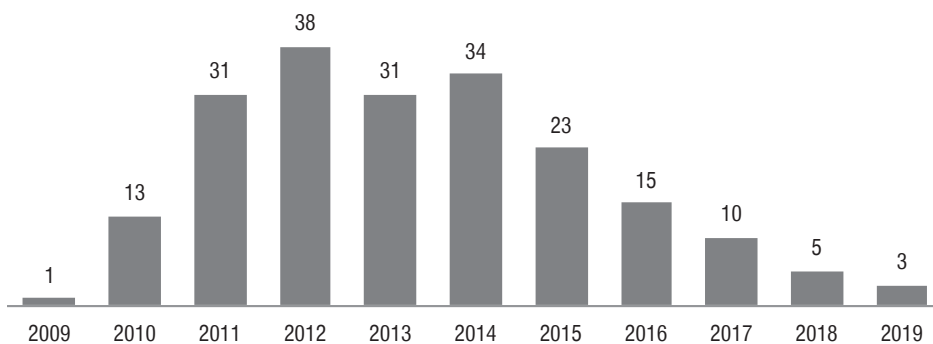
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<sup>1</sup> Obviously, this does not mean that in times of financial crises obtaining financing from bonds is easier than from bank loans. During the economic crisis the credit risk of the bond issuer also increases and increased risk aversion on the part of market investors drives down the number of small issuers [Accornero et al., 2015]. An important difference is that a large part of bank financing of enterprises are short-term (working) credits, the terms of which are renewed based on the current market situation. Bonds, on the other hand, are instruments of an equity nature that essentially finance investments and for this reason have a longer repayment period than loans. Consequently, in times of crisis, long-term bonds are an important source of financing, especially compared to short-term bank loans.

<sup>2</sup> Financial institutions were not included in the study due to the specific nature of their financial needs and the possibility of raising capital from the market based on other criteria.

Bond Act and the MAR Regulation (mainly in terms of changing the definition and rules of reporting confidential information). In 2018, the bond market was shaken by the bankruptcy of Getback SA – about PLN 2.4 billion of bonds [<https://rze.info/>] and a year later the bankruptcy of ZM Henryk Kania SA – about PLN 150 million of bonds [<https://rze.info/>]. These events have shaken investors' confidence in the bond market,<sup>3</sup> causing, among other things, outflow of capital from investment funds and an increase in the interest rate expected by investors (due to increased risk) [<https://businessinsider.com.pl/>; [www.analizy.pl](http://www.analizy.pl)]. The bankruptcy of Getback SA, where many individuals were among the direct bondholders, led to a major overhaul of the bond law in Poland,<sup>4</sup> which coincided with the entry into force of the EU Prospectus Regulation (EU 2017/1129) [<http://korporacyjnie.pl>]. As a consequence, all these factors resulted in a decrease in the number of new bond issuers on the Catalyst market.

**Chart 1. New issuers entering the Catalyst market, 2009–2019, by debut year**



Source: own study based on [www.gpwcatalyst](http://www.gpwcatalyst) and FactSet database.

It is worth citing statistics covering the size of the market for non-treasury bonds listed on Catalyst, which declined sharply after 2017, as we can see in Chart 2. Furthermore, the number of non-treasury instruments listed on Catalyst began to decline after 2017 [Raport *10 lat rynku Catalyst*, online, n.d.].

Chart 3 shows the sectoral breakdown of issuers debuting on Catalyst. The most numerous were the real estate industry<sup>5</sup> (29%, mainly housing real-estate developers), construction

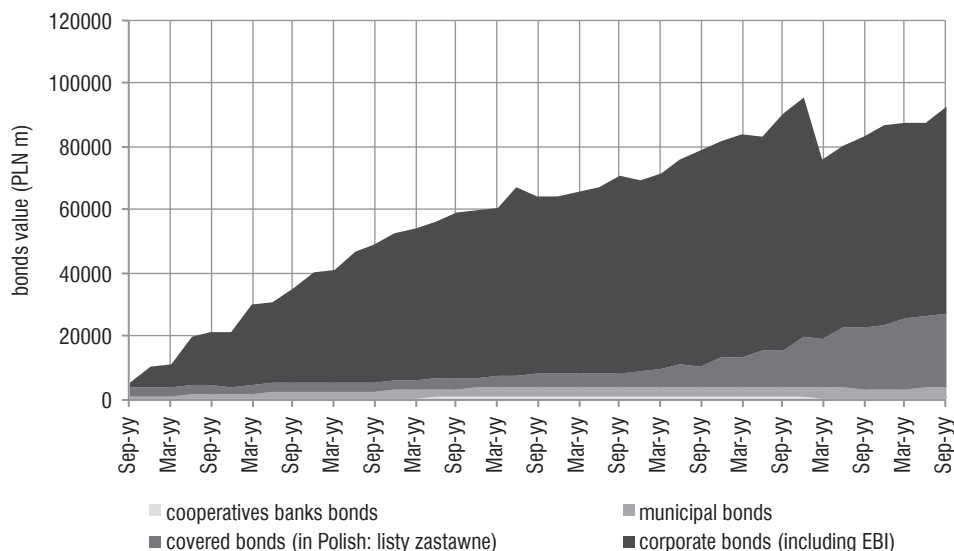
<sup>3</sup> As a result of the bankruptcy of Getback SA, the main cause of which was aggressive and fraudulent accounting, investors have become increasingly concerned about the reliability of all bond issuers, especially those traded on the public market [Raport *10 lat rynku Catalyst*, online, n.d.].

<sup>4</sup> Firstly, a new institution of the issue agent has been introduced – it is mandatory for those issues where the issuer does not intend to introduce bonds to the Catalyst (exchange traded) bond market. Secondly, a mandatory dematerialisation of bonds in the Polish National Depository for Securities (KDPW) has been introduced. Thirdly, a mandatory register of information on bonds issued [<http://rze.info>] has been created [Martysz, 2020].

<sup>5</sup> The large share of developers among bond issuers in Poland is due to the fact that financing a development investment with a bank loan is more complicated and formalised than issuing bonds. Some banks in Poland finance real-estate developers exclusively through so-called closed trust accounts (in Polish: zamknięte rachunki powiernicze) – the idea is that a person buying a flat puts money into a special trust account (held by a bank) and the developer receives the money only when the investment is completed. As a result, the real-estate developer has to finance the construction de facto from his own resources. Less restrictive are so-called open trust accounts, where money is paid to real-estate developers as construction progresses.

companies (12%), and energy and fuel industry (8%). Representatives of these three industries account for almost half of all bond issuers on Catalyst (49%).

**Chart 2. Value of non-treasury bonds listed on Catalyst by type of issuer**

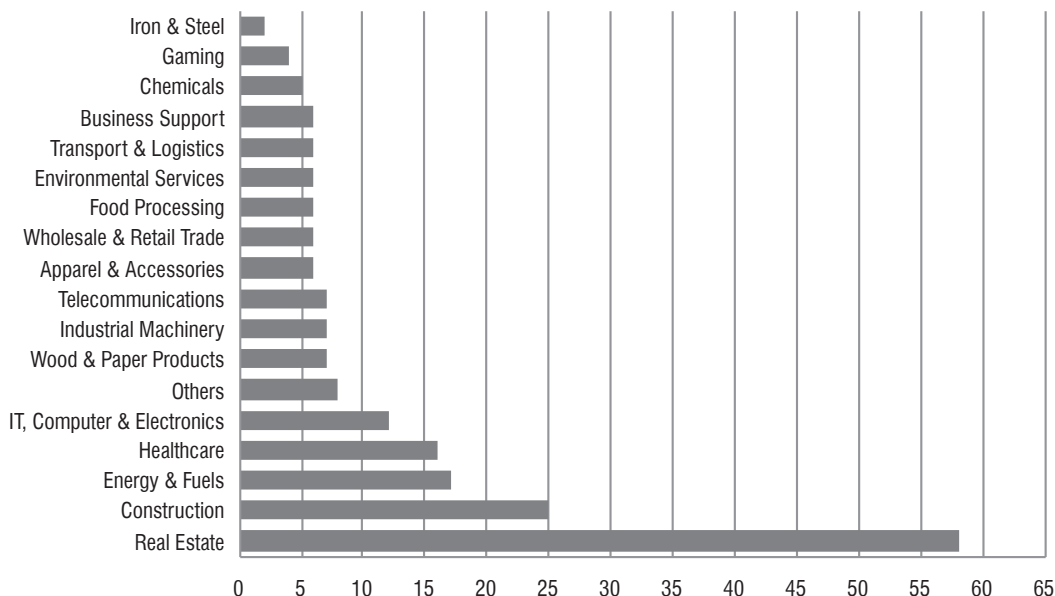


Source: own study based on [https://gpwcatalyst.pl/pub/CATALYST/files/GPW\\_2004\\_10\\_Raport\\_Catalyst.pdf](https://gpwcatalyst.pl/pub/CATALYST/files/GPW_2004_10_Raport_Catalyst.pdf)

The absolute majority of the issues under examination (96%) did not have any rating. Polish regulations do not require a rating for bonds [<https://gpwcatalyst.pl/>].<sup>6</sup> On the other hand, as much as 78% of the rated papers were classified at the investment level and the rest were considered instruments at the speculative level. Moreover, in the analysed period, 80% of debut/first issues were carried out in a prospectus exempt mode,<sup>7</sup> while only 20% of them were offered in the public mode. Secured bonds accounted for a majority of new issues (56%), and the dominant types of collateral (70%) were mortgages (mainly on real estate or the right of perpetual usufruct) and pledges (mainly registered pledges). For the remaining 30% of collateral used, suretyships and guarantees were generally used (16%), and often used in parallel with these forms of declaration on submission to enforcement (8%).

<sup>6</sup> In principle, the only case where a planned bond issue is preceded by the issuer obtaining a rating is a Eurobond issue.

<sup>7</sup> According to the previous regulations, the private placement was an offer to purchase bonds addressed to a maximum of 99 or 149 investors. From a legal point of view, as of 2019, a private placement is the offering of bonds to only one addressee [[www.knf.gov.pl/](http://www.knf.gov.pl/)]. However, there are special modes of bond issuance that allow an issue to be carried out quicker, without the need for a prospectus (e.g., for bonds issued only to so-called qualified investors, i.e., professional clients or eligible counterparties within the meaning of MIFID II). Furthermore, for other non-professional investors bonds can only be offered without a prospectus only to 149 investors over a 12-month period (however, there are some exceptions). For the purposes of this article, non-public issues should be understood as all prospectus exempt issues (including private placements and public issues) where neither the publication of a prospectus nor any other information document is required, the content of which must first (prior to the issuance) be approved by the Financial Supervision Authority, in accordance with the provisions of Prospectus Regulation 2017/1129. In contrast, prospectus issues are offered to a wide range of investors, including foremost retail investors.

**Chart 3. New issuers entering the Catalyst market between 2009 and 2019 by industry**

Source: own study based on the [www.gpwcatalyst](http://www.gpwcatalyst) and FactSet database.

## 2. Key differences between Polish corporate bond issuers and non-issuers

Analysing potential key arguments from a corporate perspective when considering bond financing, an attempt was made to identify the features differentiating issuers from non-issuers. All financial data on Polish non-financial companies were collected from the EMIS database. Out of 204 non-financial companies, 103 were selected and assigned a comparable equivalent in terms of turnover and type of business, as defined by EMIS.<sup>8</sup> In other words, debutantes from Catalyst (first time issuers) were paired with their non-issuing competitors, and the main selection criterion was the sales revenue generated in the year prior to the issue of the debt instruments. Table 1 summarises the most important features of the analysed entities: the age of the company at the time of issue, the size of assets and their growth rate in the year before the issue, sales and its dynamics in the year before the issue, financial leverage, ROA and ROE ratios as well as investments where the measure was the dynamics of changes in net fixed assets in the year before the issue of debt securities.<sup>9</sup>

<sup>8</sup> When analysing a particular company, EMIS provides its users with peer comparison of this entity. First-time issuers were compared with all other non-financial companies that never issued debt and were available in the EMIS database.

<sup>9</sup> Summary statistics on the analysed companies provided in Table 1 include age, total assets, and the rate of growth proxied by the change in total assets in the year before the issue, sales and rate of growth proxied by the change in sales in the year before the issue, financial leverage calculated as long-term financial debt over total assets, ROA computed as the ratio between EBIT from the year before the issue and total assets, ROE computed as the net

**Table 1. Summary of data concerning companies debuting on the Catalyst bond market and their counterparts not issuing bonds**

	Issuers		Non-issuers		Differences	
	Average	St. Dev.	Average	St. Dev.	Diff	T-stat
Age	25.0	27.5	17.7	18.9	7.3	2.2***
Size – total assets (m PLN)	572.8	1,121.2	262.4	621.0	310.4	2.4***
Assets growth (%)	30.9	58.5	26.8	100.0	4.1	0.4
Sales (m PLN)	570.4	1,846.4	329.9	945.7	240.5	1.2
Sales growth (%)	18.9	58	50.3	206.2	-31.4	-1.5
Leverage (%)	20.5	14.9	14.1	23.0	6.4	2.3***
ROA (%)	4.5	8.9	5.6	19.1	-1.1	-0.6
ROE (%)	12.6	36.9	11.2	57.0	1.4	0.2
Investment rate (%)	20.0	68.6	25.0	122.4	-5.0	-0.4

\*, \*\*, and \*\*\* indicate a statistical significance of 10%, 5% and 1%, respectively.

Source: own study based on the www.gpwcatalyst and EMIS database.

The obtained results expose quite a significant problem of the Polish debt market. The companies deciding to issue bonds and to debut on the Catalyst platform are mainly large, renown, mature, and profitable companies.<sup>10</sup> The average first time issuer, constructed for the purpose of the study, has had about 25 years of activity, reports total assets at the level of PLN 573 million, and its sales revenue is PLN 570 million on average. Moreover, the average first time issuer records a continuous growth in sales (+19%) and investments in fixed assets (+20%), albeit much lower than its non-issuer. It seems utmost important that an average debutant has already a certain basic level of debt (ca. 21% of assets).

On the other hand, a typical non-issuing competitor appears to be a younger (ca. 18 years), smaller (average assets of PLN 262 million) and fast-growing company with a much lower debt ratio (14%). In Poland, these types of entities are usually satisfied with bank loans, with much less frequent focus on the bond market. It is worth noting that a significant difference between issuers and their peers emerges only in the case of age, size, and financial leverage.

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income from the year before the issue over the book value of equity, the investment rate proxied by the change in net fixed assets in the year before the issue of debt securities. Total assets and sales are measured in million PLN.

<sup>10</sup> These observations are similar to those from the US and Italian bond market. In the USA, the primary determinant of the choice of debt source is the credit quality of the issuer – firms with the highest credit quality borrow from public sources, firms with medium credit quality borrow from banks, and firms with the lowest credit quality borrow from non-bank private lenders [Denis, Mihov, 2002]. Furthermore, the results of logit estimations for the Italian bond market indicate that first-time bond issuers are significantly larger and more frequently listed on the stock exchange than firms not issuing bonds [Accornero et al, 2015].

### 3. The methodological assumptions of the study

In order to understand which parameters determine Polish companies' issuance decisions, a probit model was created in which a company's choice to raise capital through the capital market was considered a dichotomous variable, taking a value of 1 for bond issuers and 0 for non-issuers. Parameters used for the purpose of the analysis assumed the companies' most fundamental characteristics reported in the year prior to the issue including the age of the company, its size (a logarithmically transformed variable), asset and sales growth dynamics, leverage, ROA, ROE, and investments in fixed assets. Table 2 presents the results of the study in four alternative model specifications concentrating on different combinations of explanatory variables.

**Table 2. Results of the probit model estimation, coefficients, and standard errors (in brackets) under four different model specifications**

	I	II	III	IV
Age	0.005445 (0.003927)	0.005972 (0.003939)	0.005893 (0.003946)	0.005932 (0.003951)
Size measured by total assets (m PLN)	0.165122*** (0.045918)	0.158432*** (0.046345)	0.156506*** (0.046521)	0.156904*** (0.046584)
Sales growth (%)	0.007782 (0.012292)	0.006529 (0.012878)	0.006826 (0.012891)	0.002397 (0.024857)
Leverage (%)		0.905860** (0.449308)	0.924134** (0.460400)	0.908508* (0.466709)
ROA (%)			-0.191843 (0.663758)	-0.183308 (0.664695)
ROE (%)			0.068469 (0.191321)	0.061991 (0.194050)
Investment rate (%)				0.001431 (0.006829)
Constant	-0.865120*** (0.227607)	-1.004230*** (0.240508)	-0.995431*** (0.243862)	-0.996120*** (0.244005)
<i>The numer of observations</i>	206	206	206	206
<i>Pseudo R<sup>2</sup></i>	6.66%	8.06%	8.12%	8.14%

\*, \*\*, and \*\*\* indicate a statistical significance of 10%, 5% and 1%, respectively.

Source: own study based on the [www.gpwcatalyst](http://www.gpwcatalyst) and EMIS database, Gretl model printout.

The results obtained from the model estimation under all the specifications clearly indicate that the size of the company (measured by the size of its assets) and its leverage, are the key parameters that make the company decide to issue bonds. The larger and more indebted entity, the greater the chances that it will try to acquire debt on the capital market when the need for external financing appears. As the Polish financial market is definitely bank-oriented, it is worth noting that bond issuance in Poland is not a primary source of external financing

as are bank loans.<sup>11</sup> This means that bond issuance in Poland usually follows bank financing and not the other way around.

The interpretation of marginal effects according to the third specification of the model allows concluding that the increase in both of the above-mentioned factors by one standard deviation, with other unchanged factors, increases the probability of the bond issue scenario by about 0.3% and 17.0%, respectively.<sup>12</sup> The existing positive correlation between the size of the company and the probability of issuing debt securities is consistent with the fact that placing bonds involves higher costs and asymmetry of information, which is a significant barrier to entering the capital market for smaller units.<sup>13</sup> After all, the asymmetry of information between large and reputable entities and investors is so limited that it makes it easier for issuers to reach a wider group of potential bondholders and obtain the assumed funds at an acceptable cost (interest rate level).

#### 4. Key conditions of the bond issue determining the non-treasury bonds' interest rate

Once a decision has been made to issue bonds, future issuers must decide on the interest rate they offer to potential bondholders. In the case of issues directed to professional investors, the interest rate or pricing is determined in the process of book building.<sup>14</sup> Definitely, investors base their decisions on the terms and conditions of the bond issue (the official document) proposed by the issuer. The investors then make (mostly binding) declarations to purchase a certain number of bonds at a certain interest rate/price. On the basis of these declarations, the issuer establishes the so-called cut-off interest rate/price and the final total amount issue, followed by the process of sending a proposal to purchase bonds. In turn, in the case of issues addressed to retail clients, the interest rate is determined by the issuer in advance and the offering process itself is preceded by the submission of the prospectus and its acceptance by the Polish Financial Supervision Authority (in Polish: KNF).

In order to determine what the real interest rate of the bonds depends on, using linear regression and the least squares method, the parameters that issuers could consider as leading in determining the future estimated interest rate of the bonds have been examined. All of these

<sup>11</sup> Only when the indebtedness of an enterprise becomes significant and banks are less willing to grant further loans (e.g., due to the lack of potential collaterals or a specific financing purpose, e.g., an investment on rented land), then issuing bonds starts to make more sense (especially since most corporate bonds issued in Poland are unsecured).

<sup>12</sup> Marginal effects calculation based on the Gretl model results:

Size:  $0.0465208 * 0.0624367$  (slope) =  $0.0029046 = 0.29\%$

Leverage:  $0.460400 * 0.368676$  (slope) =  $0.1697384 = 16.97\%$

<sup>13</sup> Prior empirical studies interpret significant financial leverage as a reputational factor. Firms with higher debt may already have a strong reputation in the market and may be able to issue public debt more easily [Denis, Mihov, 2003].

<sup>14</sup> In this process, investors usually provide their margin/price proposals for a specific number of bonds to be purchased and, on this basis, the issuer sets the so-called margin/price cut-off level (together with the issue amount) at which it offers the bonds to all investors in the formal offering phase.



features seem to be of paramount importance also from investors' perspective. In that way, 241 inaugural issues introduced to trading on Catalyst in 2009–2019 were analysed. Either the interest rate level set by the issuer (in the case of fixed coupon bonds) or the spread (which is a component of the coupon for debt securities with a variable margin) were assumed as dependent variables. The key explanatory variables include the following features (conditions) of the issue:

1. Rating: binary variable; 1 – if a rating is given, 0 – if not.
2. Call option (possibility of early redemption of bonds by the issuer): binary variable; 1 – if the issue has a call option, 0 – if not.
3. Issue collateral: binary variable; 1 – if the issue is collateralised, 0 – if not.
4. Issue type: binary variable; 1 – if the issue is non-public (prospectus exempt), 0 – if public.
5. Issue purpose: binary variable; 1 – if the issue purpose is defined, 0 – if not.
6. Issue currency: binary variable; 1 – if the issue is organised in the Polish currency, 0 – if not.
7. Issue size: continuous variable representing the logarithmically transformed total value of the issue in million PLN.
8. Frequency of interest payments: a continuous variable indicating the number of payments made during the year.
9. Years to maturity: a continuous variable indicating the number of years remaining to maturity of bonds by the issuer.

The data on issues (e.g., ratings, issue type, size) comes from two main sources: the GPW Catalyst and Obligacje.pl database. This sample includes 241 inaugural issues, of which 169 were floating rate and 72 fixed rate issues. All of them are related to non-financial companies exclusively. Based on the aforementioned features, two different models were created – one explaining pricing of variable rate issues solely (169 observations) and another related entirely to fixed rate bond placements (72 observations). The results obtained for each explained variable have been collected and shown in Table 3. In the columns OLS estimates of regression coefficients together with standard errors and R-squared have been reported. Both models seem to have substantial explanatory power, as indicated by the coefficient of determination.

A significant proportion of issuers on the Polish debt market decide to issue corporate bonds with a call option, which entitles them to redeem their debt before the set maturity date. Money from bonds is relatively expensive, so the possibility of refinancing it with a cheaper bank loan or a new issue is a desirable situation from the perspective of the company. On the other hand, such a move means for the investor an earlier than planned completion of the investment.<sup>15</sup>

Therefore, it seems quite surprising that the result of the study indicates that the issue of instruments with an embedded option clause contributes to lowering the interest rate rather than increasing it in order to reward investors with additional risk related to early redemption.

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<sup>15</sup> This is particularly important if the investor has bought the bond in the secondary market above the nominal price, in which case the exercise of the call option by the issuer may even mean a loss for such an investor.

The rationale for such a situation may be the fact that the use of the call option most often involves the payment of a premium expected by the bondholders, which issuers preventively include in the valuation of their debt securities.

**Table 3. Results of the estimation of parameters of the corporate bond interest rate model, coefficients, and standard errors (in brackets)**

	Floating rate	Fixed rate
Rating	0.002486 (0.004956)	0.007421 (0.041583)
Callable	-0.003594* (0.001917)	-0.039651*** (0.008721)
Secured	0.003966** (0.001851)	0.016212 (0.010365)
Private placement (prospectus exempt)	-0.006367*** (0.001951)	0.018423 (0.012127)
Use of proceeds mentioned	0.000121 (0.001851)	0.000156 (0.013826)
Issuance in the local currency	0.010409 (0.013296)	-
Payment frequency	0.001787* (0.001010)	0.010054*** (0.002238)
Years to maturity	-0.003768*** (0.001100)	-0.003662 (0.005092)
Issuance value in m PLN	-0.005368*** (0.000831)	-0.010209*** (0.003045)
Constant	0.064904*** (0.013866)	0.084538*** (0.022828)
<i>Observations</i>	169	72
<i>R-squared</i>	62.59%	53.43%

\*, \*\*, and \*\*\* indicate a statistical significance of 10%, 5% and 1%, respectively.

Source: own study, Gretl model printout.

A relatively small part of corporate bond issues listed on Catalyst is secured debt. The establishment of collateral is often the decisive criterion from the investor's perspective. For an issuer, the idea of securing bonds comes down to the possibility of obtaining cheaper financing. Therefore, it may be surprising that the result of the analysis implies a positive correlation between the security of the issue and the interest rate. It turns out that, paradoxically, in Polish conditions, a large part of secured issues has a higher-than-average interest rate. This is how companies try to compensate for and even cover their less significant financial standing<sup>16</sup> as issuers with a good financial standing do not have to secure bonds as they get lower bond margins anyway.

<sup>16</sup> Where possible, companies shall seek to issue unsecured bonds first. The need to secure bonds arises when investors perceive the credit risk of the issuer to be high and simply require additional security.

An interesting observation is also the significant impact of the type of issue on the interest rate. According to the results of the model specification for floating-coupon bonds, it can be clearly stated that with other unchanged factors, the interest rate on non-public (prospectus exempt) issues is on average 0.64% lower than that of the public (prospectus) offering.<sup>17</sup> In the case of fixed interest rate bonds, this effect is opposite, because placing fixed interest debt securities is connected with higher coupon. Such a tendency seems to be consistent with the reality. It is also important to underline that a vast majority of non-treasury bonds in Poland have a variable (floating) interest rate [Martysz, 2020]. Fixed coupon issues are rare and, from the perspective of Polish investors, so risky that it means that it is necessary to offer investors higher potential profits in exchange for taking additional risk of bond price volatility.<sup>18</sup>

It is worth noting that a vast majority of prospectus exempted bond issues in Poland are usually addressed to institutional investors who prefer the floating rate securities in order to avoid the risk of bond price volatility.<sup>19</sup> As institutional investors have been relatively willing to invest their funds in this asset class over the last decade, the interest rate could be set at a slightly lower level.

Another statistically significant parameter was the size of the bond issue, which has a negative impact on the interest rate. This result is as consistent as possible with the specifics of the Polish debt market, where the largest bond issues are usually conducted by large and reputable companies. These in turn, due to their good reputation, can afford to offer lower interest rates to investors acquiring their bonds.

The debt capital market in Poland is characterised by another unobvious phenomenon. At first glance, the negative relationship between the maturity and the interest rate level seems illogical. However, also in this case it reflects the domination of large and well-known entities on the Polish debt market, which as one of the few are able to place debt securities with longer maturities and moderate interest rates.

The frequency of paying remuneration to investors also seems to be crucial from the point of view of setting the interest rate for the issue of securities based on a variable percentage. After all, companies perceived by the market as having a higher risk profile must offer higher coupons, the materialisation of which is required by prudent bondholders at more frequent intervals.

Although other studies confirmed that the ratings of corporate bonds are the most important factor determining the spreads between the yield to maturity of corporate bonds and that of

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<sup>17</sup> This is probably due to the fact that prospectus issues are mostly targeted at retail investors who usually expect higher margins than institutional investors. This may be due to the fact that in the case of a public offering directed to the retail sector, the issue dealer (broker) does not carry out bookbuilding. The issuer must, therefore, offer a sufficiently attractive bond margin (with a premium) to be sure that retail investors will respond to its offer.

<sup>18</sup> When interest rates change, prices of fixed coupon bonds can move much stronger than prices of floating coupon bonds. In other words, floating-coupon bonds are more resilient to interest rates changes. For this reason, investors who decide to buy fixed coupon bonds expect a higher risk premium.

<sup>19</sup> Almost all non-treasury bonds in Poland are floating rate bonds, based on the variable WIBOR 3M or 6M index and a fixed margin. For this reason, the issue of interest rates for non-Treasury bonds mainly boils down to the (fixed) bond margin. In this article we refer to the broader concept of interest rate (and not only to the margin).

equivalent Treasury securities [Gabbi, Sironi, 2005;<sup>20</sup> Elton, Gruber, Agrawal, Mann, 2000<sup>21</sup>], too few rated issuers on the Catalyst market (4%) makes it impossible to confirm this thesis (using our model) for the Polish bond market.

## 5. Financial factors determining the non-treasury bonds' interest rate

Having identified the leading parameters of bonds from the issuer's point of view, which have a real impact on the bond pricing, we also decided to look at certain measures and indicators reflecting the financial situation of companies newly listed on the Polish Catalyst bond market (debutants) in order to verify the significance of the impact of these measures on the bond interest rate. The study took into account 103 entities debuting on the Catalyst market, including 86 companies that carried out the issue of bonds based on a variable interest rate, and 17 that undertook the issue of fixed coupon papers. The results of the estimation are presented in Table 4.

The following issuers' features were again adopted as key explanatory variables: the age of the company at the time of the issue, the size of assets, sales dynamics in the year before the issue, leverage understood as the ratio of long-term liabilities to total assets of the company, ROA as well as the dynamics of investments made in fixed assets in the year preceding the placement of corporate debt securities. Two different models (under two different specifications each) were created by means of simple linear regression and the least squares method – one explaining pricing of variable rate issues solely (86 observations) and another related entirely to fixed rate bond placements (17 observations).

In variants of the model concerning the issue of debt securities with a variable coupon, the key parameter which has a real impact on the interest rate of issued bonds is the financial leverage of a given company. The fundamental threat to investors is the insolvency of the issuer, therefore, the higher the debt in the balance sheet of a given company, the more it is perceived by potential bondholders as risky, which in turn implies higher interest rates.

In one of the specifications of the model explaining the issue of floating rate bonds, the results of the estimation allow us to say that the interest rate value is significantly influenced by the expenses made by the company on fixed assets in the year preceding the bond issue. Companies deciding to undertake certain investment projects have to consider the fact that

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<sup>20</sup> Furthermore, these researchers also found that the primary market efficiency – as measured by variables such as the amount of fees charged to the issuer, the number of managers in the bond issuing syndicate, and the issuance process (private placement versus public issue and fixed-priced versus open-priced ones) – and the expected secondary market liquidity appeared as poor explanatory variables for bond spreads.

<sup>21</sup> The authors also proved that the greatest impact on the prices of bonds (please keep in mind that we studied the bond interest at issue) had (in addition to having a rating) the differences in the ratings of various rating agencies, the differences in the rating of bonds and the rating of the issuer, the coupon of bonds and whether bonds are new and have been traded in the market for more than a year.

some of them may simply turn out unprofitable. It happens that financial losses resulting from such misguided projects lead, especially among smaller entities, to a loss of liquidity or even bankruptcy of the issuer. Therefore, it is not surprising that companies in the phase of intensive investments have to take into account the necessity to offer a higher coupon of issued bonds.

**Table 4. Results of the estimation of parameters of the corporate bond interest rate model – indicators describing the company, coefficients, and standard deviation (in brackets)**

	Floating rate		Fixed rate	
	I	II	I	II
Age	-	0,000063% (0,000053%)	-0.000600 (0.001367)	-0.000475 (0.001876)
Size measured by total assets (m PLN)	-0.006152*** (0.000688)	-0.006437*** (0.000732)	-0.010611* (0.005479)	-0.011697* (0.005942)
Leverage	0.013459** (0.006130)	0.016881** (0.006968)	-0.029124 (0.066650)	-0.016634 (0.069360)
Sales growth (%)	-	-	0.0157639 (0.020643)	0.046366 (0.038521)
ROA	-0.026137 (0.018890)	-0.024806 (0.017978)	-	-0.085325 (0.095259)
Investment rate (%)	0.000014*** (0.000002)	0.000005 (0.000007)	-	-0.016710 (0.020664)
Constant	0.081286*** (0.004621)	0.081237*** (0.004619)	0.138296*** (0.029008)	0.147772*** (0.039206)
<i>Observations</i>	86	86	17	17
<i>R – squared</i>	83.76%	81.37%	40.61%	48.83%

\*, \*\*, and \*\*\* indicate a statistical significance of 10%, 5% and 1%, respectively.

Source: own study based on the [www.gpwcatalyst.com](http://www.gpwcatalyst.com) and EMIS database, Gretl model printout.

Another significant measure determining the interest rate on a given bond series (regardless of the coupon type) is the size of the issuer's total balance sheet. Large and reputable companies are usually perceived as more secure, which makes it easier for them to find those willing to buy the bonds they place. All this allows for greater freedom of action and the possibility of obtaining debt from the bond issue at a lower cost.

## Summary

Issuers of bonds listed on the Polish Catalyst bond trading platform are mainly large, mature, and profitable enterprises with quite a significant level of financial leverage. According to our research, high financial leverage is the main reason for issuing corporate bonds instead of using bank loans. Furthermore, public bond issuers show a noticeable degree of concentration around the dominant sectors with a particular emphasis on the real estate development and energy-fuel industries. The profile of needs, which they try to finance by

issuing debt securities, is clearly heterogeneous – these are mainly investments in assets and development, debt refinancing, and general needs of the company.

The research shows that the size of the issuer may constitute a significant barrier to entering the Polish debt market and raising capital through bond issue. We found a positive correlation between the size of the company and the likelihood of its decision to issue bonds. Moreover, for most companies in Poland, bank credit is a form of first choice financing, therefore, the decision to issue bonds is often made at the very end – in situations of additional capital needs. This should be considered as contradictory to what one would expect according to the theory of capital structure. This is largely due to the status quo maintained by the overcapitalised banks. The bond market has not been able to create a competitive offer for creditworthy issuers for many years.

The most important determinants of the non-treasury bond interest rates in Poland are financial leverage and the size of the issuer. A fundamental threat to investors is the insolvency of an issuer, therefore, the higher the debt in the balance sheet of a given issuer, the more it is perceived by potential bondholders as risky, which implies higher bond interest rates. As far as large (in terms of their balance sheets) and reputable companies are concerned, they are generally considered to be more secure, which makes it easier for them place bonds at a competitive interest rate levels. Thus, regarding the bonds terms and conditions of issue, our research showed that callable, non-collateralised bonds issued privately and in large series had statistically lower interest rates.

Finally, it is worth mentioning that a potential ally of disintermediation of corporate financing may turn out to be the current policy of low interest rates, leading to a decrease in profitability of long-term treasury instruments and thus mobilising investors, who are seeking for higher returns, to enter the more risky Polish corporate bond market.

Nevertheless, as our research was limited only to bonds listed in organised trading markets and did not include the unlisted bond market, this limitation, as well as our methodology, may be the motivation for future researchers to survey other fixed-income markets.

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### Legal acts

1. Regulation (EE) 2017/1129 of the European Parliament and of the Council of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, and repealing Directive 2003/71/EC.