

PIRAEUS BANK



Enterprise Rating System (ERS): Improvement of the rated corporations distribution. What is the extent of the extra funding?



1 Research motivation | Key Findings

2 Presentation of the ERS Results for 2019

3 Simulation exercise of potential bankable corporate population

4 Appendices

Purpose of the study



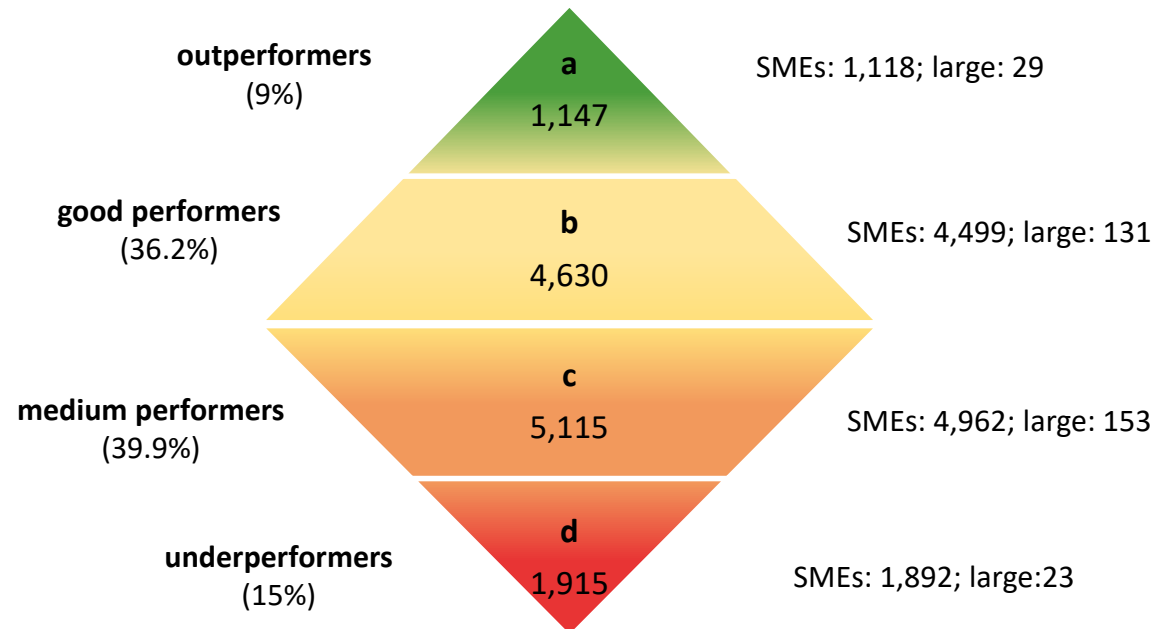
- ✓ We updated our quantitative rating system for domestic enterprises, the Enterprise Rating System (ERS). By applying fully transparent and quantitative criteria, this rating system enables to classify the enterprises into four categories of ratings to enhance the risk assessment capabilities.
- ✓ The system can identify enterprises with solid financial performance, medium-performing firms, and corporations that are underperforming and encounter major financial problems.
- ✓ Moving our analysis a step forward, we wanted to estimate what the potential extra funding for enterprises would be. This extra funding could be a potential benefit for the corporations, as they could expand their activities and, consequently, their productivity and profitability, via the financing of their new operations and making investments.
- ✓ So, for the purposes of our analysis, we run a simulation exercise to evaluate the potential bankable corporate population based on our ERS 2019 sample. We think that 2019 is a suitable year for performing this analysis, since it was the last pre-pandemic year.
- ✓ After the initial economic shock of the outburst of the pandemic, business activities have returned to normal. Since enterprises have not yet published their current financial statements, we assumed that the current corporate performance is similar to that of 2019, without the effect of any exogenous factors.
- ✓ We looked for healthy, viable firms that could extend their existing debt level and tried to estimate the funding value. We defined as the initial potential universe the enterprises that outperform or well perform; in other words, they are rated "a" or "b"*. Then we excluded firms with a solvency rating of "d" and negative equity, which signaled overleverage. Finally, we excluded firms with negative EBITDA, which is a signal of poor profit performance and consequently poor debt service.
- ✓ But we would not want to harm their capital structure in order to be able to serve their debt and perform their loans. So, we set as a ceiling the parameter that the extra funding would not result in total new liabilities exceeding their existing equity level.



Key Findings (I): 2019 vs. 2018: More enterprises received higher ratings based on ERS

- ✓ In 2019, in a sample of 12,807 enterprises, 97.4% were small and medium-sized enterprises (SMEs; turnover up to €50 mn).
- ✓ The enterprises that outperformed, thus achieving the highest ERS rating ("a"), constituted 9% of the sample, which is higher than in 2018 (7.7%).
- ✓ 36.2% of the enterprises with good but less satisfactory performance were rated "b".
- ✓ The enterprises that fell behind significantly and were rated "c" accounted for the largest percentage of the sample (39.9%).
- ✓ Finally, enterprises with serious problems were rated "d" and accounted for 15% of the sample.
- ✓ In comparison with 2018, we witnessed a movement of distribution toward higher ratings among the companies.

Enterprise breakdown by ERS rating, 2019





- ✓ Overall, only 9% of the analysed enterprises were outperformers ("a"), with €15.2 bn in assets and €9.5 bn in equity value.
- ✓ However, they managed to achieve profits before taxes amounting to €1.7 bn, accounting for 30.6% of the sample's total profitability.
- ✓ In general, their EBITDA margin was 24.3%, and their return on equity was 19.2%.
- ✓ 1.2% of outperformers had positive EBITDA and losses before taxes, and they were SMEs.
- ✓ At the same time, they took on the fewest liabilities (€5.7 bn) or 5% of the sample's total liabilities.
- ✓ They had a high degree of liquidity, with their current assets covering their current liabilities by approximately 4.2 times. The coverage of large enterprises was lower (3.9 times).
- ✓ They had low leverage, as their liabilities amounted to only half of their equity.
- ✓ The net debt of outperforming SMEs in relation to EBITDA was almost zero. For large enterprises, the relative ratio was higher but remained low (1.1 times).
- ✓ Consequently, their debt servicing ability was high, as EBITDA covered financial expenses by 24 times, while none of these enterprises had an interest coverage ratio less than 1.



Key Findings (III): ERS 2019 | Profile of good performers “b”



- ✓ Good performers ("b") were the second-most-populated category of our assessment tool, accounting for 36.2% of our sample.
- ✓ The total value of their equity was €31,1 billion, and 58.6% of that was owned by large businesses.
- ✓ The liabilities of good performers ("b") were higher than those of outperformers ("a") at €34.4 bn.
- ✓ Their contribution was important in terms of turnover (€49.3 bn), EBITDA (€7.2 bn) and profits before taxes (€4.5 bn).
- ✓ The levels of their profitability performance were more limited than outperformers ("a") but still satisfactory, with the EBITDA margin at 14.3% and return on equity at 13.7%.
- ✓ 5.3% of good performers had positive EBITDA and net losses before taxes, and they were SMEs.
- ✓ The level of their liquidity was below that of outperformers ("a") but still satisfactory because current assets were 2.6 times current liabilities, while the coverage of large enterprises was lower at 1.8 times.
- ✓ They had higher debt levels, as liabilities exceeded equity by 1.2 times, and the average net debt was 3.3 times higher than EBITDA.
- ✓ They were able to handle their debt well because EBITDA covered their financial costs by an average of 14.2 times.
- ✓ Only 0.5% of good performers had an interest coverage ratio less than 1, and they were SMEs.



Key Findings (IV): ERS 2019 | Profile of medium performers “c”



- ✓ Most enterprises were rated as medium performers, and they had the highest aggregated asset value (€69.9 bn).
- ✓ Medium performers took on the highest value of financial expenses (€1.5 bn), and more than half of these enterprises were large enterprises.
- ✓ They recorded the highest turnover (€61.9 bn) in total but only €693 mn in profits before taxes, most of which was reported by large enterprises.
- ✓ They achieved low levels of efficiency and profitability, as the EBITDA margin was only 8.1% and the return on equity was 6%. The equity of large enterprises performed better at 11.2%.
- ✓ 13.8% of SMEs and 11.1% of medium-performing large enterprises had positive EBITDA and net losses before taxes.
- ✓ Their liquidity is lower because their current assets only cover their current liabilities 1.5 times for SMEs and 1.2 times for large businesses.
- ✓ They had high net debt, which exceeded EBITDA by 13.5 times for SMEs and by 12.5 times for large enterprises.
- ✓ Their debt servicing was low, as SMEs' EBITDA covered financial expenses by 4.9 times and large enterprises by 5.4 times.
- ✓ 16.6% of SMEs and 3.3% of large enterprises had an interest coverage ratio below 1.



Key Findings (V): ERS 2019 | Profile of underperformers “d”



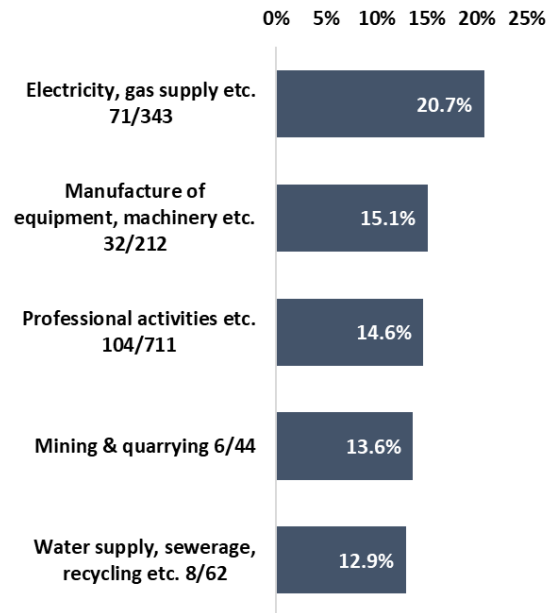
- ✓ In the "d" rating, 79.3% of the trapped assets belonged to SMEs (€19.9 bn vs. €5.2 bn in large enterprises).
- ✓ The negative total equity (€-766.9 mn) of underperformers ("d") revealed their adverse financial conditions. Even though, the underperforming large enterprises were only 23 in our sample, they aggregated 39.5% of the total negative equity of underperformers.
- ✓ The net debt was almost the same as liabilities, indicating limited cash buffers.
- ✓ The liabilities of SMEs were almost four times those of large enterprises (€20.4 bn) and the financial expenses (€290.1 mn) were almost twice as high.
- ✓ Sales of €7.7 bn resulted in losses, even at the EBITDA level, of €-152.7 mn, which increased to €-1.3 billion before taxes.
- ✓ As they were basically loss-making enterprises, the average EBITDA margin was -9%. However, the average performance of large enterprises was marginally negative (-0.1%).
- ✓ The management of equity was inefficient, with a negative return on equity of -15.6%. The negative performance of large enterprises was limited to -11.3%.
- ✓ Only 12.2% of SMEs and 43.5% of underperforming large businesses had positive EBITDA and net losses before taxes.
- ✓ They encountered obvious liquidity difficulties as their current liabilities exceeded their current assets (current ratio: 0.7 points).
- ✓ They were overleveraged enterprises with liabilities at 3.7 times the equity. The performance of large enterprises was even worse at four times the equity.
- ✓ At the same time, net debt was 24.1 times EBITDA. The performance of large enterprises was slightly better (22.6 times EBITDA).
- ✓ Almost all SMEs (78.9%) and 43.5% of large enterprises had an interest coverage ratio below 1.



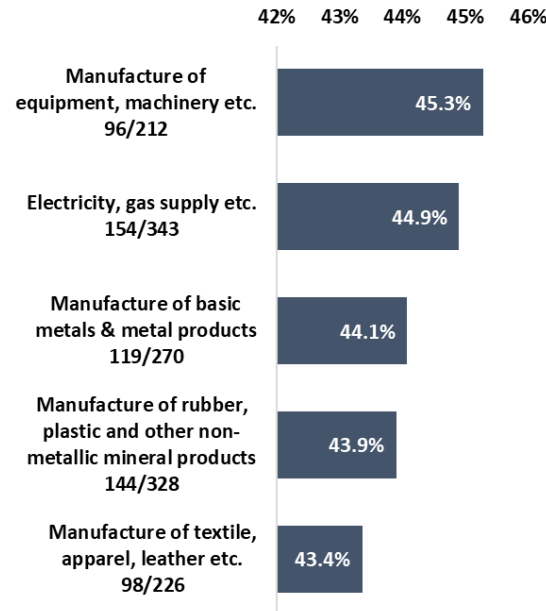
Key Findings (VI): Top five sectors per ERS rating, 2019

- ✓ The highest percentages of outperformers ("a") among their companies were in the *energy* and *manufacturing of equipment and machinery* sectors, at 20.7% and 15.1%, respectively.
- ✓ Again, there were good performers in the *manufacturing of equipment and machinery* and *energy* sectors (45.3% and 44.9%, respectively). They were followed by manufacturers of *basic metals and metal products* (44.1%).
- ✓ However, many agri-food corporations had medium performance ("c") (the *agriculture* sector at 55.1% and the *food, beverage, and tobacco manufacturing* industries at 44.5%).
- ✓ More than a quarter (25.2%) of *rest service* activities firms underperformed and were rated "d", followed by *information and communication* companies (21.5%).

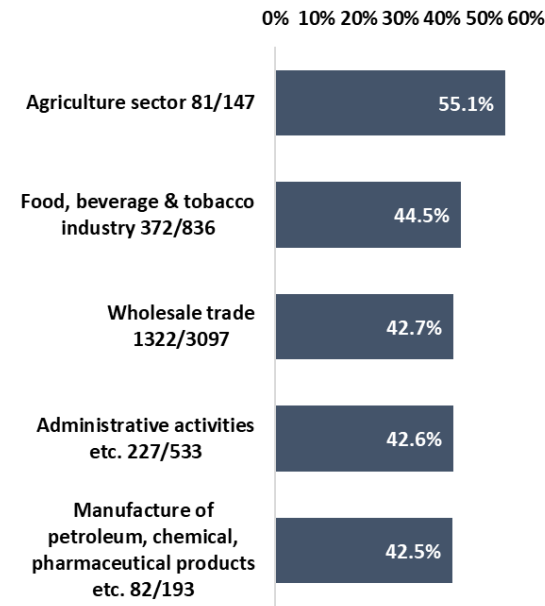
Top 5 sectors with outperformers ("a")



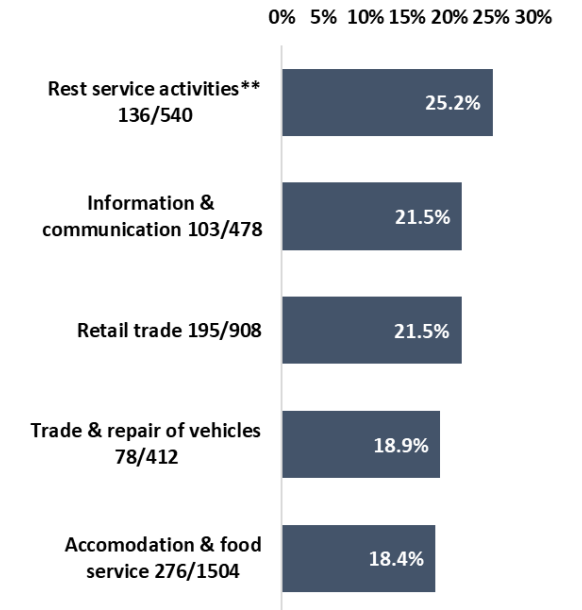
Top 5 sectors with good performers ("b")



Top 5 sectors with medium performers ("c")



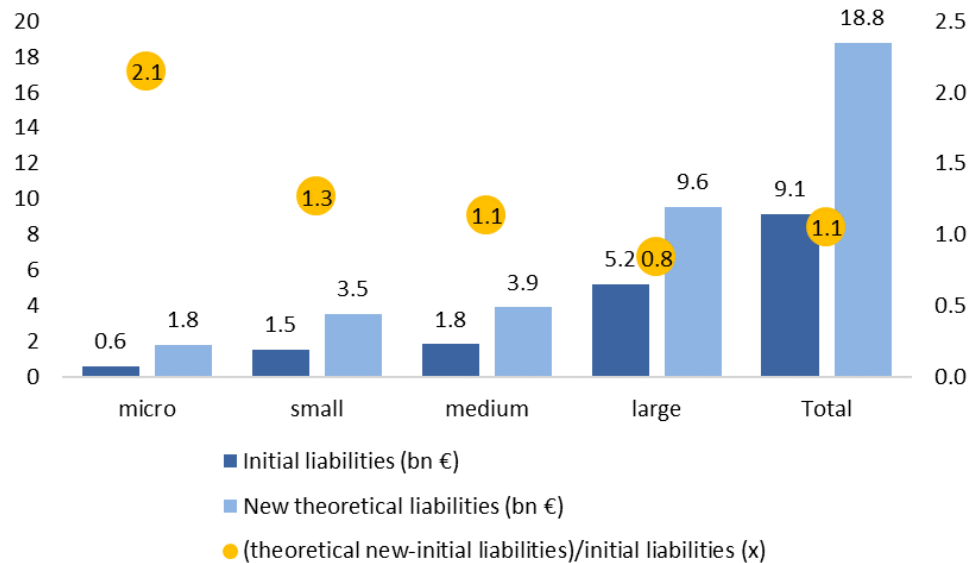
Top 5 sectors with underperformers ("d")



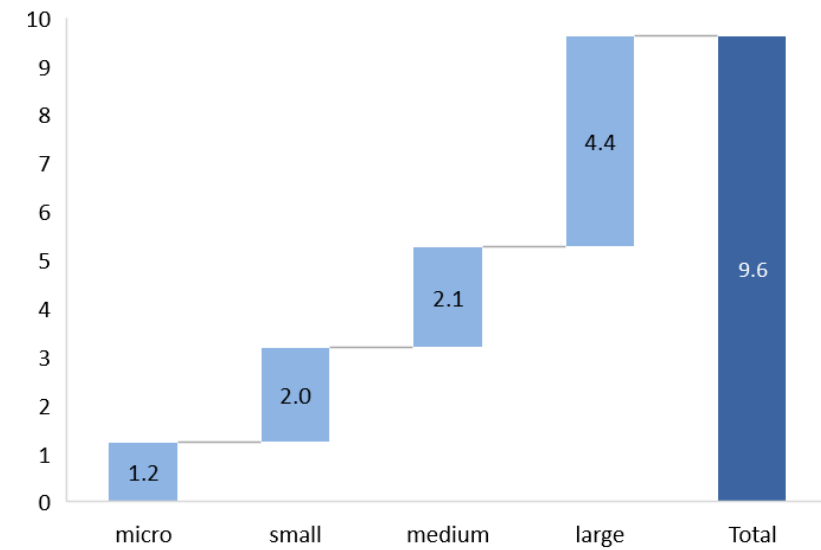
Key Findings (VII): Simulation outcome for potential extra funding

- ✓ Out of 12,807 firms in our initial sample, 2,899 were eligible for extra funding. This number accounts for 22.6% of the sample.
- ✓ The majority of them are microenterprises, which make up 13% of the initial sample.
- ✓ The lowest percentage is recorded in large enterprises. However, because of their size, the accumulated impact is significantly higher than for the other size classes.
- ✓ If the eligible firms increased their liabilities to match their equity level, then their new theoretical liabilities would be more than twice as high at €18.8 bn from €9.1 bn.
- ✓ This transformation is translated to a total amount of extra funding of €9.6 bn, equal to 5.2% of GDP*.
- ✓ 45.4% of the funding would be absorbed by the large firms (€4.4 bn).
- ✓ On the other hand, in microenterprises, it would correspond to the least total amount, equal to €1.2 bn.

Actual and theoretical new liabilities (in € bn)



Potential extra funding (in € bn)





1 Research motivation | Key Findings

2 Presentation of the ERS Results for 2019

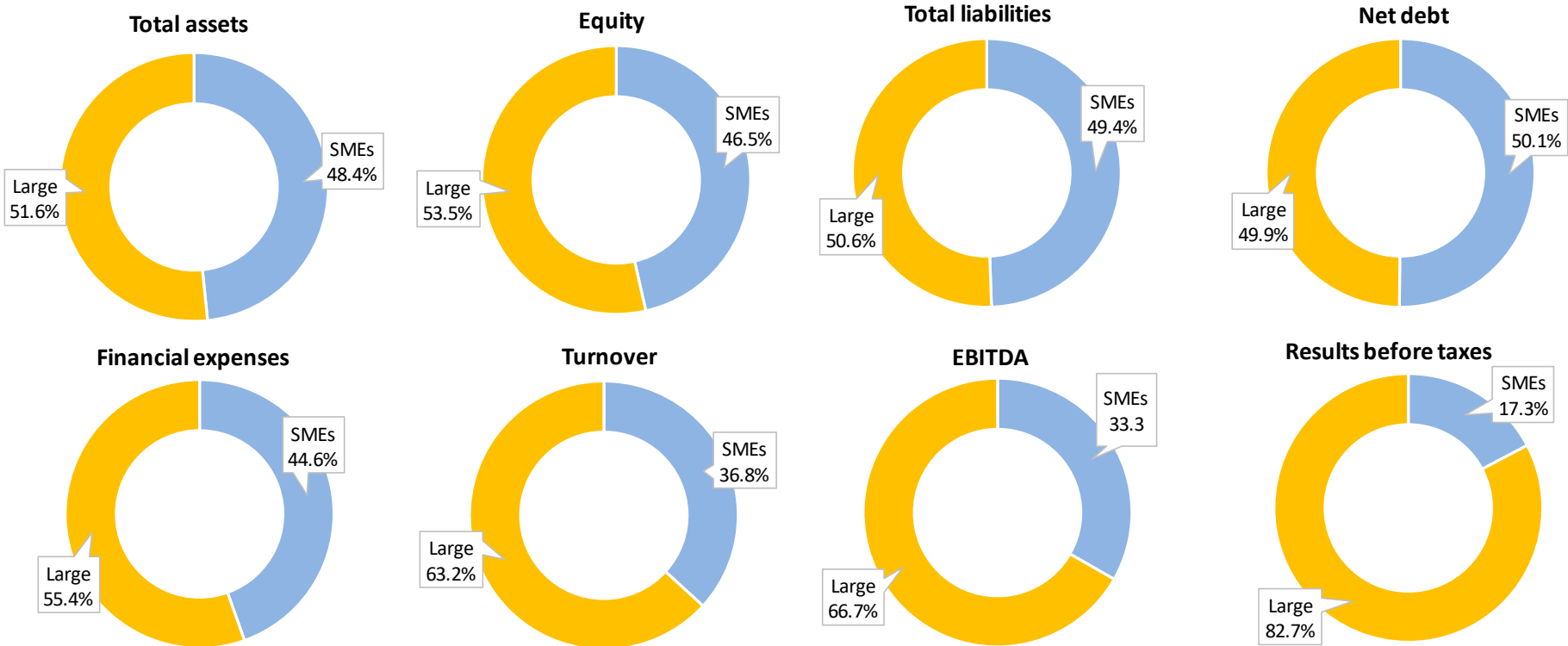
3 Simulation exercise of potential bankable corporate population

4 Appendices

Structure of Greek business landscape

The vast majority of enterprises in the sample of 12,807 enterprises were SMEs (97.4%). After estimating the key financial figures of the domestic enterprise mixture (SMEs and large enterprises), the following conclusions were reached:

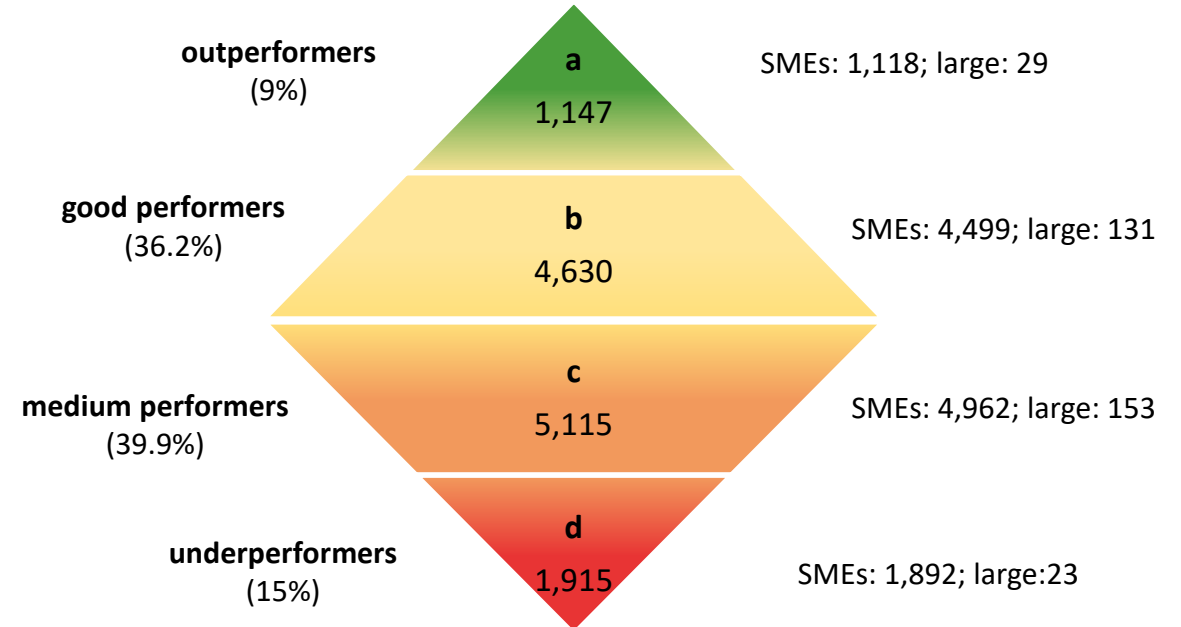
- ✓ The aggregated assets of the sample were almost equally shared between SMEs and large firms.
- ✓ In terms of capital structure, large enterprises accounted for 53.5% of equity, but they took on less liabilities (50.6%) in total than SMEs.
- ✓ However, large enterprises had higher financial expenses (55.4%) overall than SMEs.
- ✓ Despite their high number, the turnover of SMEs was 36.8% of the aggregate.
- ✓ Finally, large enterprises were more efficient, as they contributed 82.7% of the total profits before taxes.



More enterprises received higher ratings based on ERS, 2019 vs. 2018

- ✓ Out of the sample of 12,807 enterprises, the figures for 2019 showed a total reported turnover of €128 bn, EBITDA of €13.2 bn and profits before taxes of €5.6 bn.
- ✓ However, aggregated undertaken liabilities constituted €113.8 bn, net debt amounted to €98.9 bn and financial expenses were €3 bn.
- ✓ The enterprises that outperformed, thus achieving the highest ERS rating ("a"), constituted 9% of the sample, which is higher than in 2018 (7.7%).
- ✓ 36.2% of the enterprises with good but less satisfactory performance were rated "b".
- ✓ The enterprises that fell behind significantly and were rated "c" accounted for the largest percentage of the sample (39.9%).
- ✓ Finally, enterprises with serious problems were rated "d" and accounted for 15% of the sample.
- ✓ In comparison with 2018, we witnessed a movement of distribution toward higher ratings among the companies.

Enterprise breakdown by ERS rating, 2019



Breakdown by ERS rating, 2018 vs. 2019

(2018 sample: #12,259, 2019 sample: #12,807, as % of enterprises)

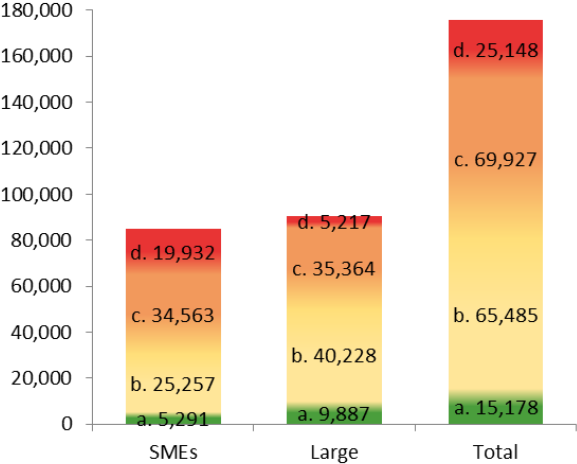
	a		b		c		d	
	2018	2019	2018	2019	2018	2019	2018	2019
Total	7.7%	9.0%	35.3%	36.2%	41.0%	39.9%	16.0%	15.0%
Liquidity	17.7%	18.6%	21.5%	20.9%	28.2%	28.4%	32.6%	32.0%
Profitability	5.8%	6.1%	32.5%	34.0%	33.5%	33.5%	28.2%	26.3%
Solvency	17.6%	19.3%	26.3%	26.6%	34.5%	34.1%	21.5%	20.0%



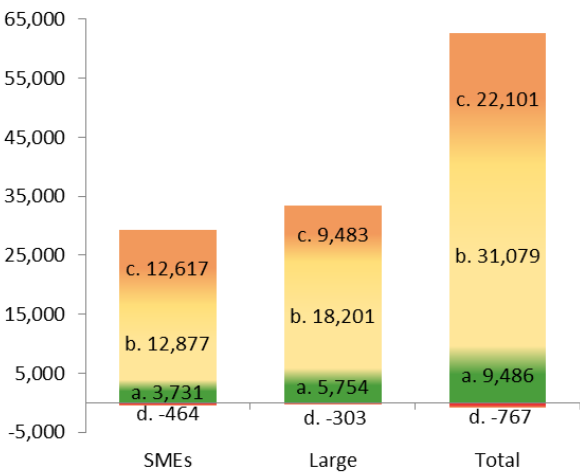
Financial figures per final ERS rating (I)



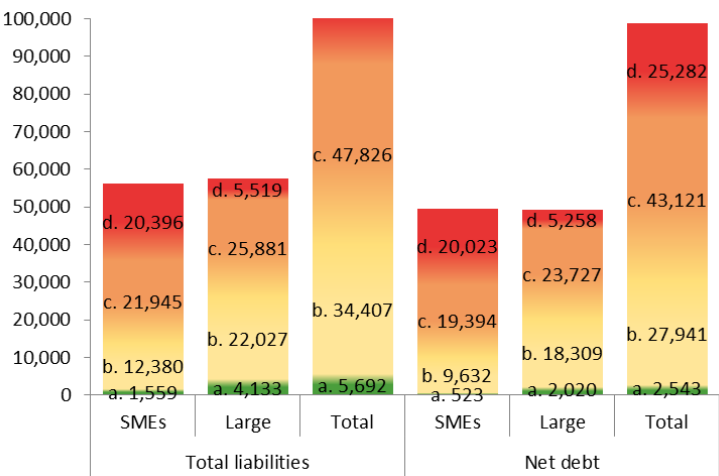
Total assets, 2019 (in € mn)



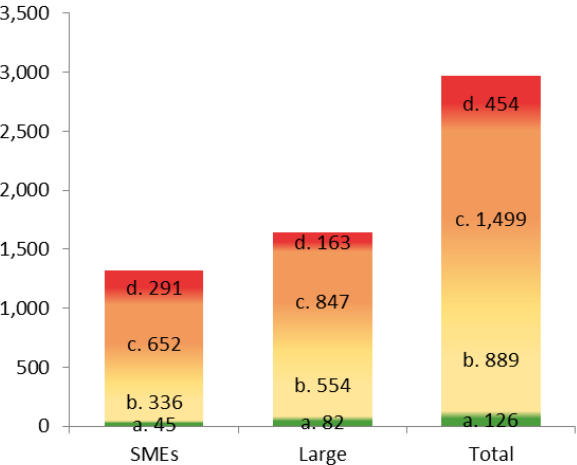
Equity, 2019 (in € mn)



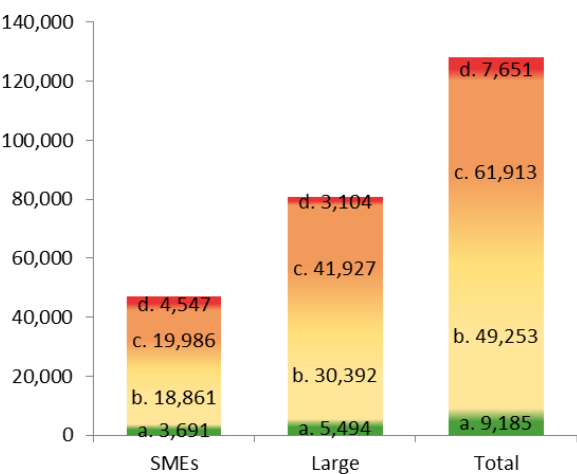
Total liabilities and net debt, 2019 (in € mn)



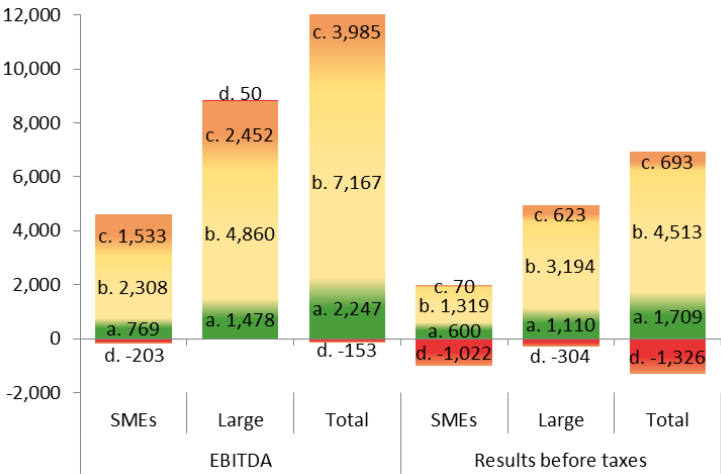
Financial expenses, 2019 (in € mn)



Turnover, 2019 (in € mn)



EBITDA and results before taxes, 2019 (in € mn)



Financial figures per final ERS rating (II)



Outperformers (“a”)

- ✓ The total assets and equity of large outperformers ("a") were greater than (€9.9 bn and €5.8 bn respectively) than those of SMEs.
- ✓ They took on the least in total liabilities (€5.7 bn).
- ✓ They constituted only 9% of all enterprises and were highly efficient. Without achieving the highest total turnover (€9.2 bn), their profits before taxes reached €1.7 bn (30.6% of the total amount).

Medium performers (“c”)

- ✓ Most enterprises were rated "c", thus gathering the highest asset value (€69.9 bn), followed by enterprises rated "b" (65.5 bn).
- ✓ Large enterprises represented about 54.1% of the liabilities of medium performers ("c").
- ✓ At the same time, medium performers ("c") had the highest financial expenses, amounting to €1.5 bn, while large enterprises had about €847 mn.
- ✓ Most enterprises were rated "c" and had the highest total turnover of €61.9 bn, most of which stemmed from large enterprises.
- ✓ But even though sales were high, medium performers ("c") couldn't keep up the same level of profitability. Their total profits before taxes only reached €693 mn, mostly contributed by large enterprises.

Good performers (“b”)

- ✓ Among all ERS ratings, they accumulated the most equity (31.1 bn euros), of which large businesses held the majority (€18.2 bn).
- ✓ Their liabilities were higher at €34.4 bn than those of outperformers ("a").
- ✓ They performed well, as with €49.3 bn in turnover, they earned profits before taxes of €4.5 bn—the highest aggregate among all ERS ratings.

Underperformers (“d”)

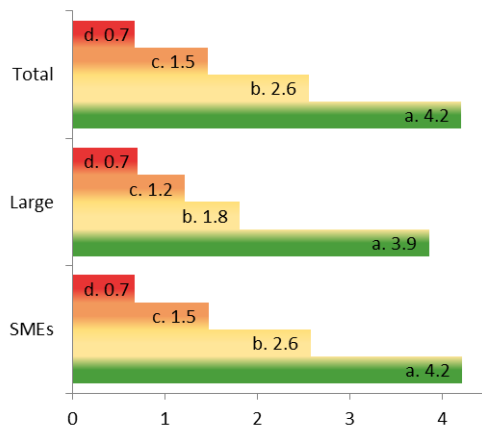
- ✓ In the "d" rating, 79.3% of trapped assets belonged to SMEs (€19.9 bn), which had a total negative equity of €464 mn.
- ✓ Large underperforming businesses, on the other hand, racked up €-303 million in negative equity, bringing the total negative equity of "d"-rated underperformers to €-767 mn.
- ✓ Compared to large enterprises, underperforming SMEs ("d") had a higher debt burden as their liabilities were almost four times those of large enterprises and their financial expenses almost twice that of large companies, amounting to €20.4 bn and €291 mn, respectively.
- ✓ Lastly, underperformers ("d") had low cash buffers because the difference between their liabilities and net debt was the smallest of all ERS ratings, showing that they had serious liquidity problems.
- ✓ The €7.7 bn in sales of underperformers ("d") resulted in losses, even at the EBITDA level, amounting to €-153 mn, and were further expanded in terms of losses before taxes, reaching €-1.3 bn.
- ✓ The EBITDA losses of underperformers ("d") were mostly due to the performance of SMEs. Large enterprises indicated marginal EBITDA profits, amounting to €50 mn.



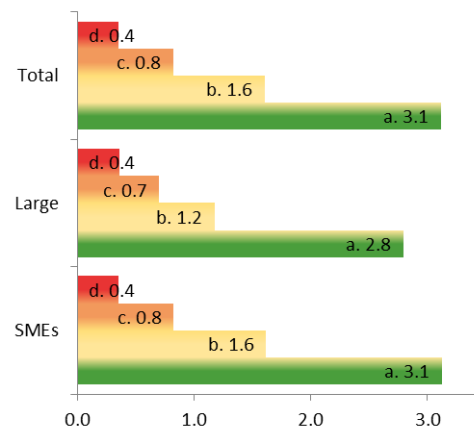
Financial ratios per final ERS rating (I)



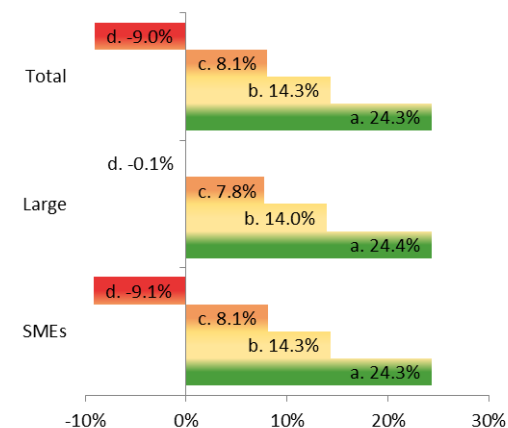
Current ratio, 2019



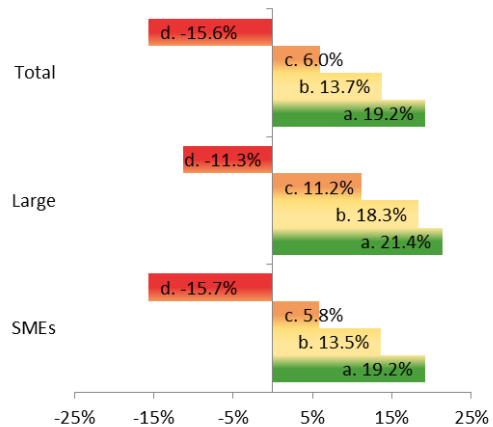
Quick ratio, 2019



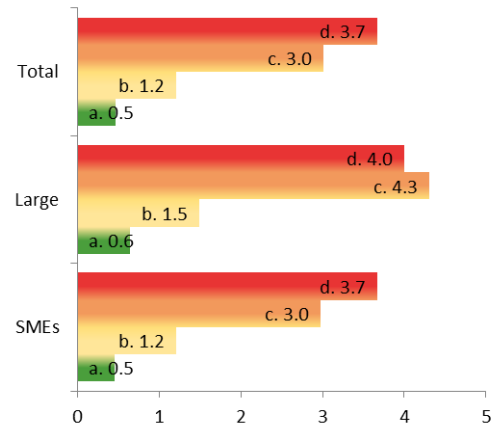
EBITDA margin, 2019



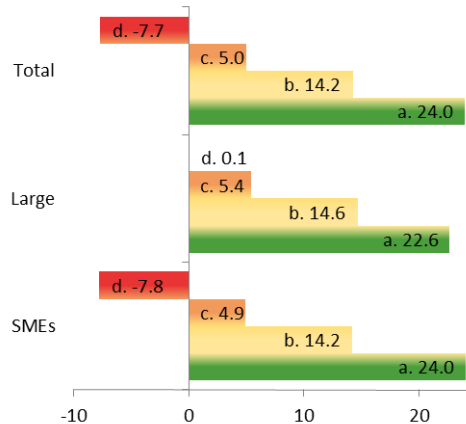
Return on equity*, 2019



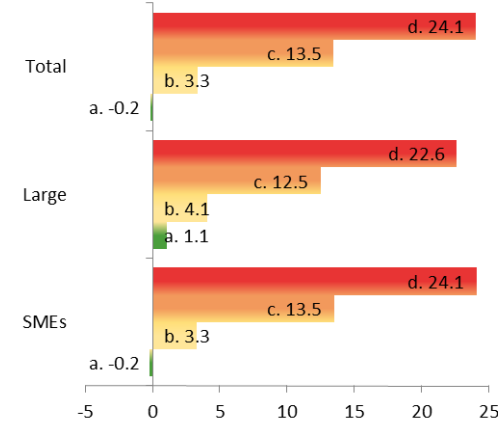
Total liabilities to equity*, 2019



Financial expense coverage ratio, 2019



Net debt to EBITDA**, 2019



Financial ratios per final ERS rating (II)



Outperformers (“a”)

- ✓ Their current assets were 4.2 times their current liabilities for SMEs and 3.9 times for large enterprises.
- ✓ They were very profitable, with the EBITDA margin amounting, on average, to 24.3%. At the same time, the average return on equity reached 19.2% for SMEs and 21.4% for large corporations.
- ✓ They had low leverage, as their liabilities amounted to only half of their equity. The net debt of outperforming SMEs in relation to EBITDA was almost zero. It was higher, but not much, for large enterprises (1.1 times).
- ✓ Their average EBITDA covered financial expenses by 24 times. Regarding large enterprises, this ratio was lower at 22.6 times, but still very high.

Medium performers (“c”)

- ✓ Their liquidity was tighter, with current assets being 1.5 times current liabilities for small and medium-sized businesses (SMEs) and 1.2 times for large businesses.
- ✓ Their EBITDA margin was, on average, 8.1%, and their return on equity was 6%. The equity profitability of large enterprises was better (11.2%).
- ✓ The capital structure significantly deteriorated compared to the previous ERS ratings, with total liabilities being three times the amount of equity for SMEs and 4.3 times for large enterprises. Moreover, net debt was, on average, higher than EBITDA by 13.5 times. This ratio for large enterprises was a bit lower, at 12.5 times.
- ✓ As SMEs' EBITDA covered their financial costs by 4.9 times, the level of debt service deteriorated significantly. The performance of large enterprises was better (5.4 times).

Good performers (“b”)

- ✓ Their current ratio was lower than that of outperformers ("a") but still satisfactory (at 2.6 times for SMEs and 1.8 times for large enterprises).
- ✓ Their efficiency was more moderate but still satisfactory, with an EBITDA margin of 14.3% and a 13.7% return on equity. Good-performing large firms' equity was more efficient (18.3%).
- ✓ Compared to outperformers ("a"), the leverage went up because liabilities were more than equity by 1.2 times and average net debt was more than EBITDA by 3.3 times.
- ✓ At the same time, they were adequately able to manage their debt. EBITDA covered financial expenses by 13.5 times on average.

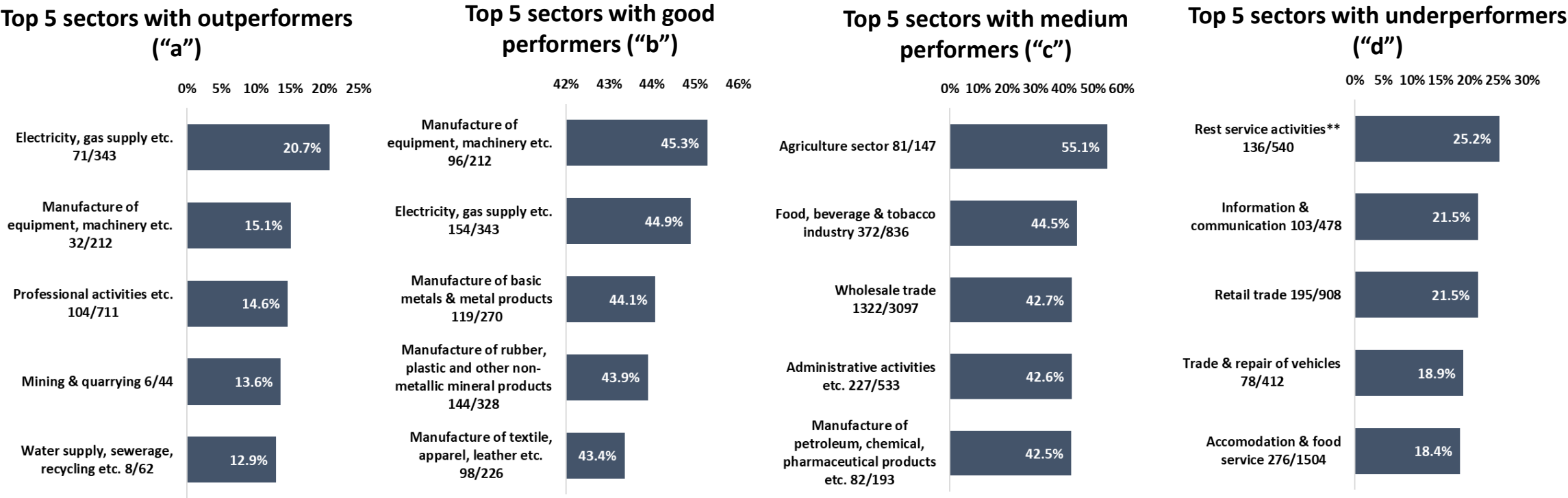
Underperformers (“d”)

- ✓ They seemed to encounter serious liquidity problems. Current liabilities exceeded their current assets, with an average current ratio of 0.7 units.
- ✓ They were loss-making on average, with a negative EBITDA margin of -9%.
- ✓ Even though they had a total EBITDA of €50 million, each large underperforming business ("d") found that the average EBITDA margin was slightly negative, at 0.1%.
- ✓ Lastly, on average, the equity made losses, with a negative return on equity of -15.6%. But the negative performance of large outperformers ("d"), at -11.3%, was lower than that of SMEs.
- ✓ They were overleveraged, as their liabilities were 3.7 times their equity for SMEs and 4 times for large enterprises.
- ✓ Net debt was 24.1 times higher than EBITDA, while large enterprises rated "d" managed to contain this ratio at 22.6 times.



Top five sectors per ERS rating, 2019

- ✓ The highest percentages of outperformers (“a”) among their companies were in the *energy* and *manufacturing of equipment and machinery* sectors, at 20.7% and 15.1%, respectively.
- ✓ Again, there were good performers in the *manufacturing of equipment and machinery* and *energy* sectors (45.3% and 44.9%, respectively). They were followed by manufacturers of *basic metals and metal products* (44.1%).
- ✓ However, many agri-food corporations had medium performance ("c") (the *agriculture* sector at 55.1% and the *food, beverage, and tobacco manufacturing* industries at 44.5%).
- ✓ More than a quarter (25.2%) of *rest service* activities firms underperformed and were rated "d", followed by *information and communication* companies (21.5%).



PIRAEUS BANK ** education, human health activities, art and entertainment and other service activities

Note: in brackets the number of companies of ERS 2019 sample





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2 Presentation of the ERS Results for 2019

3 **Simulation exercise of potential bankable corporate population**

4 Appendices

Who is eligible for extra funding?



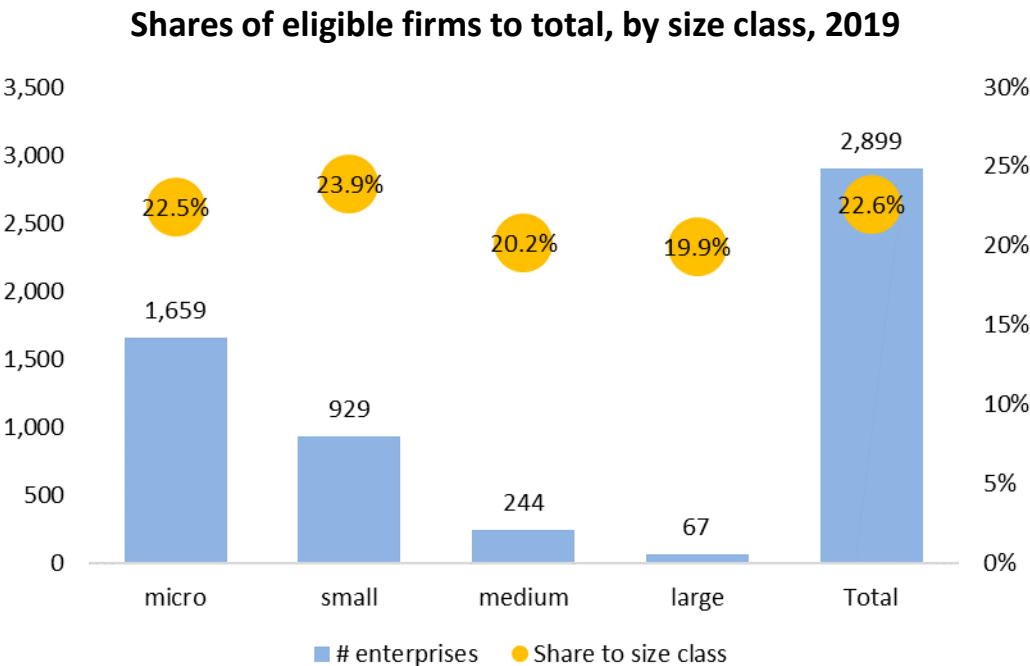
- ✓ Our goal is to identify those who could potentially borrow more than their existing liabilities. In other words, we look for healthy, viable firms that could extend their debt level.
- ✓ This extra funding could be a potential benefit for the corporations, as they could expand their activities and, consequently, their productivity and profitability, via the financing of their new operations.
- ✓ Nowadays, we return to normal after the economic shock caused by the outburst of the pandemic. 2019 was the last pre-pandemic year.
- ✓ Since enterprises have not yet published their current financial statements, we assumed that the current corporate performance is similar to that of 2019, without the effect of any exogenous factors.
- ✓ So, for the purposes of our analysis, we run a simulation exercise to evaluate the extent of the potential bankable corporate population based on our ERS 2019 sample.
- ✓ We defined as the initial potential universe the enterprises that outperform or well perform, in other words, they are rated "a" or "b"*. Then we excluded firms with a solvency rating of "d" and negative equity, which signaled overleverage. Finally, we excluded firms with negative EBITDA, which is a signal of poor profit performance and consequently poor debt service.
- ✓ The interest coverage ratio is the next tool we use to find out if a company can meet its financial obligations based on its operating profits. The implemented threshold is the 25th percentile of the interest coverage ratio distribution for each size class.
- ✓ But we would not want to harm their capital structure in order to be able to serve their debt and perform their loans. So, we set as a ceiling the parameter that the extra funding would not result in new total liabilities exceeding their existing equity level.



Mapping the eligible firms for extra funding (I)



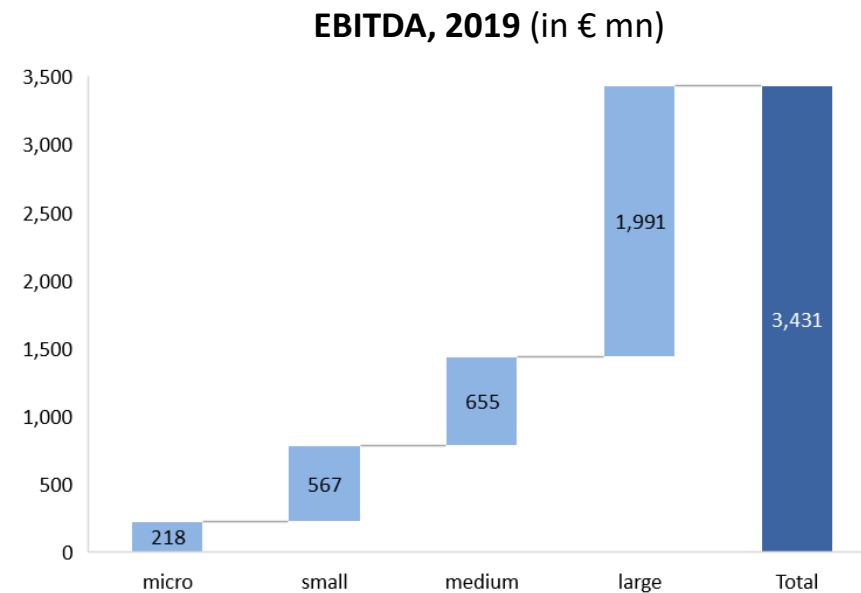
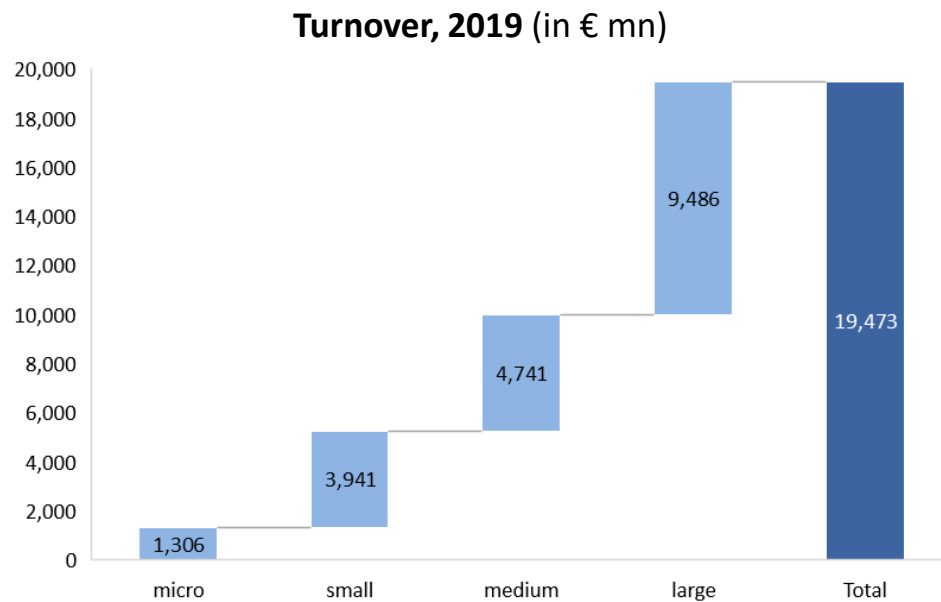
- ✓ Out of 12,807 firms in our initial sample, 2,899 were eligible for extra funding. This number accounts for 22.6% of the sample.
- ✓ The majority of them are microenterprises, which make up 13% of the initial sample.
- ✓ The lowest percentage is recorded in large enterprises. However, because of their size, the accumulated impact is significantly higher than for the other size classes.



Mapping the eligible firms for extra funding (II)



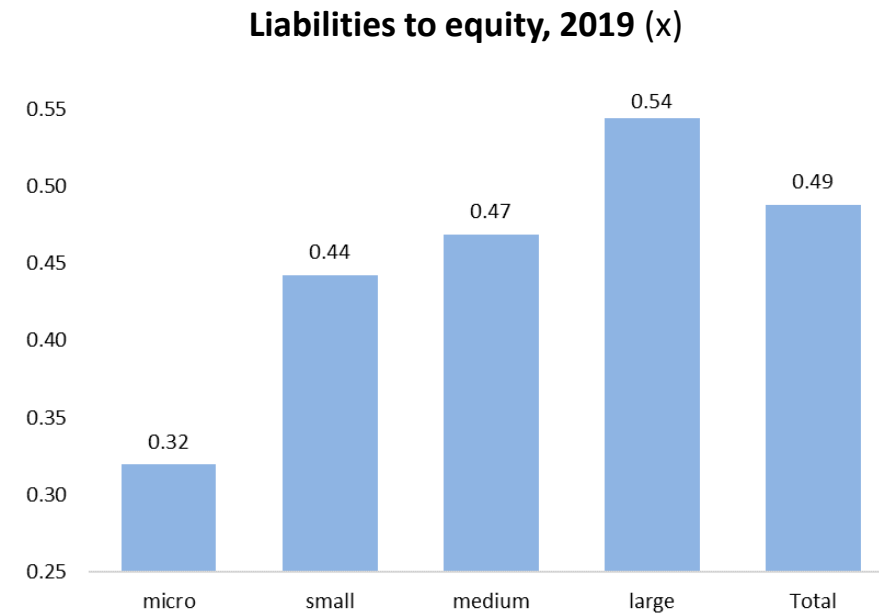
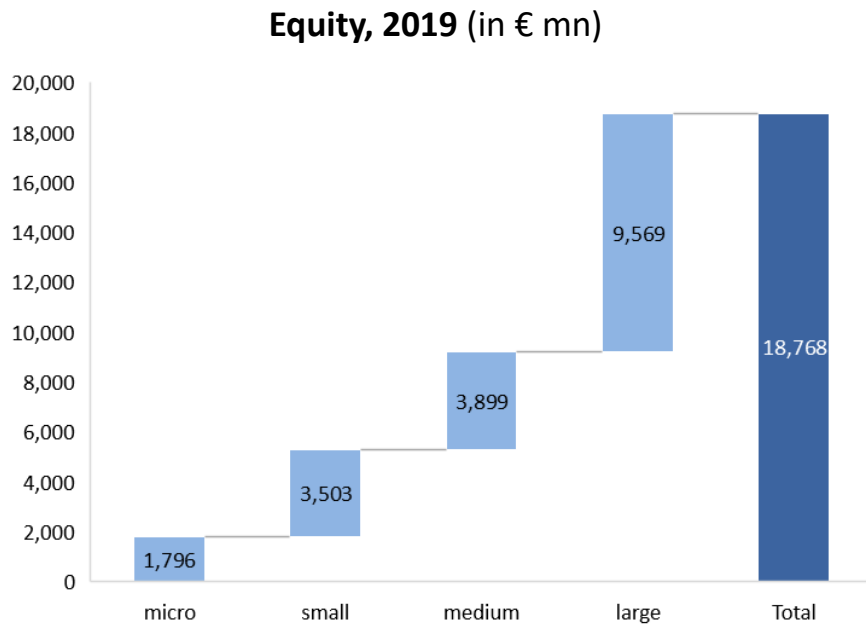
- ✓ The total value of the turnover of the eligible firms was €19.5 bn. Their aggregated EBITDA amounted to €3.4 bn.
- ✓ Large corporations might be less than the others, but they have the highest contribution in terms of turnover and EBITDA (48.7% and 58%, respectively).
- ✓ On the other hand, the most populated category – the microfirms – had the lowest share of turnover at 6.7% and of EBITDA at 6.3%.



Mapping the eligible firms for extra funding (III)



- ✓ The equity value of the eligible firms reached €18.8 bn. In other words, this is the ceiling of the respective increase in liabilities through the additional funding, so that the liabilities to equity will be equal to 1.
- ✓ The actual liabilities accounted for half the equity on average.
- ✓ Microenterprises seemed to have the biggest margin to increase their liabilities, as their ratio was 0.32 times.

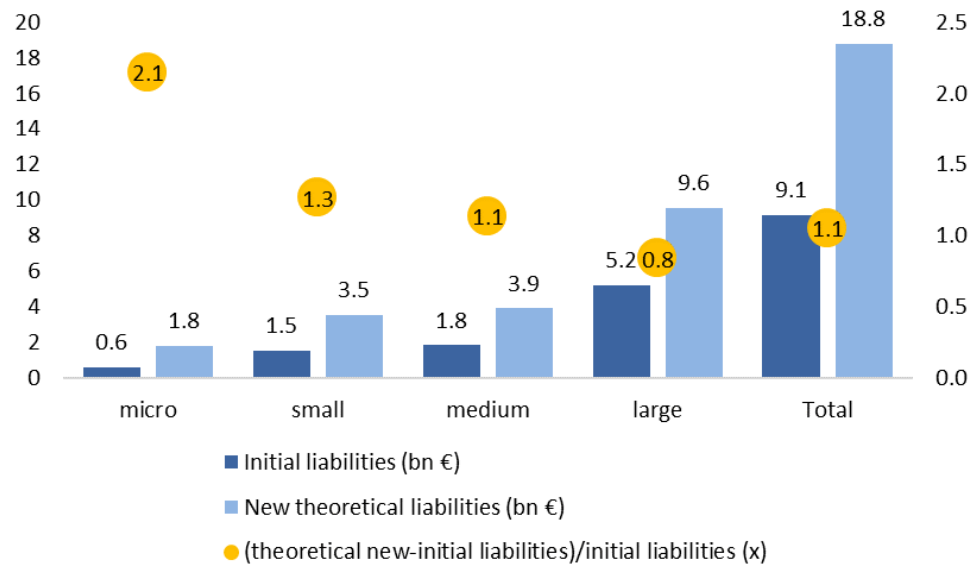


Potential extra funding: Simulation outcome

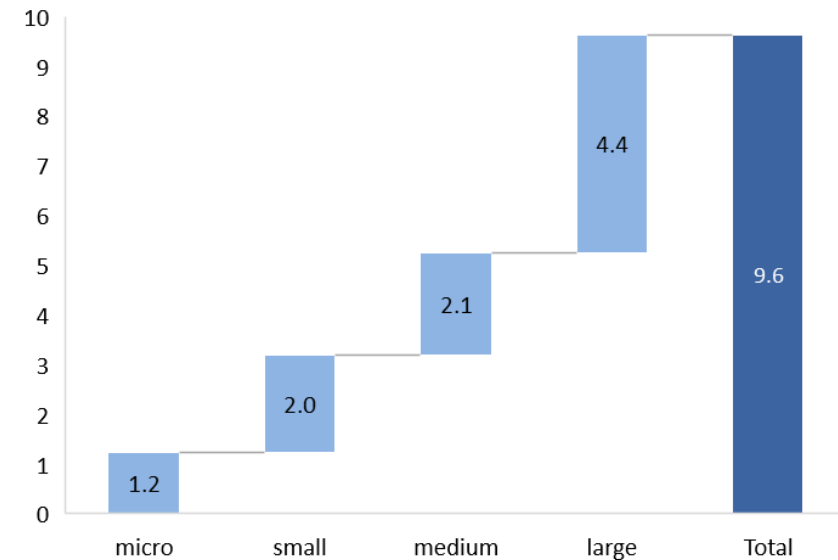


- ✓ If the eligible firms increased their liabilities to match their equity level, then their new theoretical liabilities would be more than twice as high at €18.8 bn from €9.1 bn.
- ✓ This transformation is translated into a total amount of extra funding of €9.6 bn, equal to 5.2% of GDP.
- ✓ The large firms (€4.4 bn) would take up 45.4% of the funding.
- ✓ On the other hand, in microenterprises, it would correspond to the least total amount, equal to €1.2 bn.

Actual and theoretical new liabilities (in € bn)



Potential extra funding (in € bn)





1 Research motivation | Key Findings

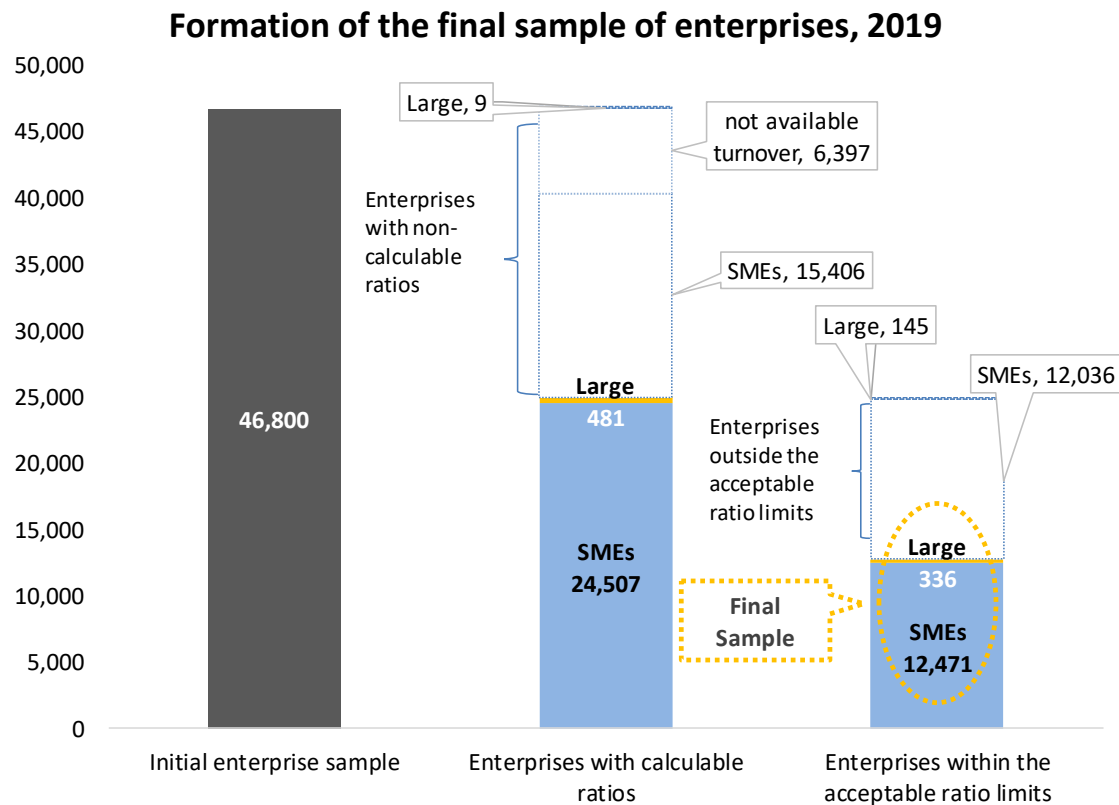
2 Presentation of the ERS Results for 2019

3 Simulation exercise of potential bankable corporate population

4 Appendices

Appendix I: Selection of the enterprise sample

The source of the financial data is ICAP CRIF DATA.Prisma and the data extraction period is October 2021. The initial number of enterprises with available published assets in 2019 was 46,800. The turnover was chosen as the most suitable criterion for the classification of enterprises according to their size. Therefore, the SMEs* selected were enterprises whose turnover amounted to (and included) €50 mn, and the turnover of large enterprises exceeded €50 mn. In the next step, the selected enterprises had available data for the year 2019, in terms of the accounts used to calculate the financial ratios in question. This led to a sample of 24,988 enterprises (24,507 SMEs and 481 large enterprises) with calculable ratios. Finally, after the adoption of acceptable limits for the ratios, the final sample of the examined enterprises was reduced to 12,807 enterprises (12,471 SMEs and 336 large ones).



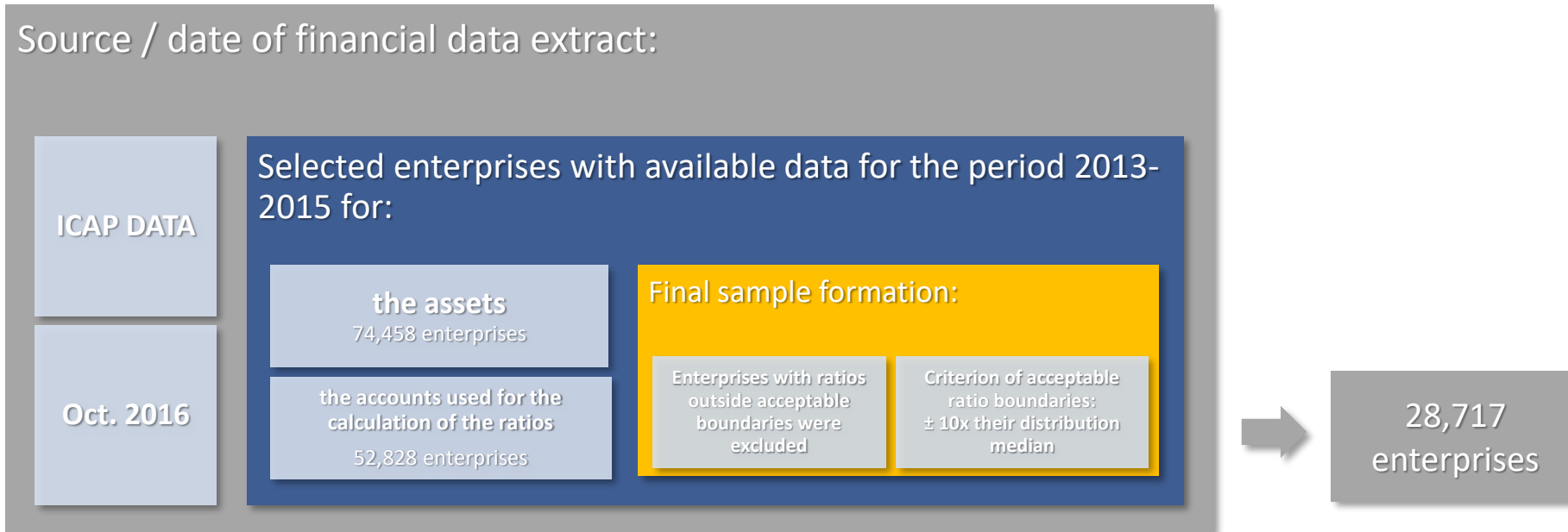
* After adopting the turnover ceilings of the SMEs definition stipulated by the European Commission (Commission Recommendation 2003/361/EC).



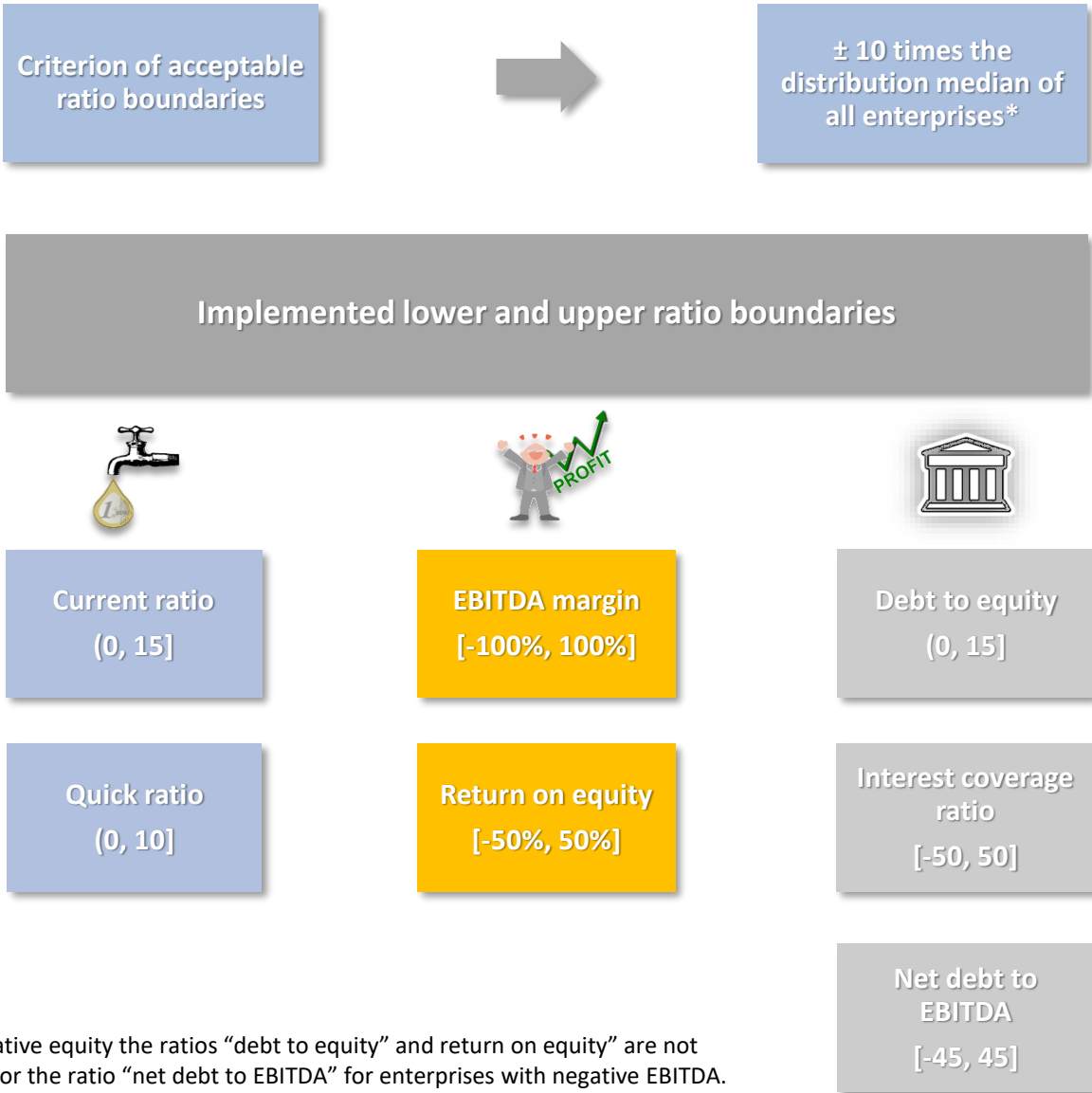
Appendix I: Methodology of Enterprise Rating System

For the purpose of this analysis, **all enterprises were examined**, without any size criteria. Furthermore, **all sectors** of economic activity were examined according to the **NACE rev. 2** classification, with the following exceptions:

- **K**: Financial and insurance activities
- **O**: Public administration and defence; compulsory social security
- **T**: Activities of households as employers; undifferentiated goods – and services – producing activities of households for own use
- **U**: Activities of extraterritorial organisations and bodies



Appendix I: Definition of acceptable ratio boundaries



* For the enterprises with negative equity the ratios “debt to equity” and return on equity” are not considered. The same applies for the ratio “net debt to EBITDA” for enterprises with negative EBITDA.

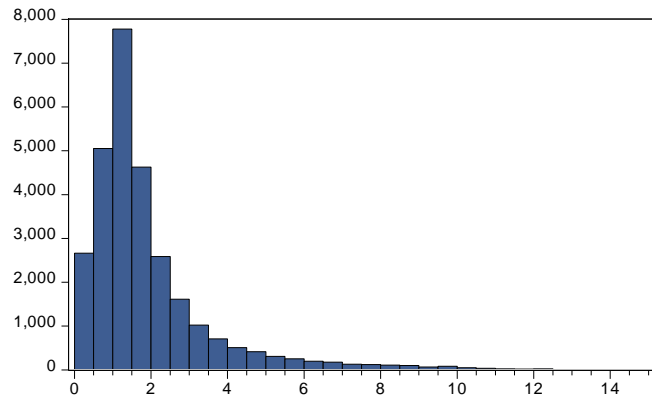


Appendix I: Enterprise distribution per ratio (I)

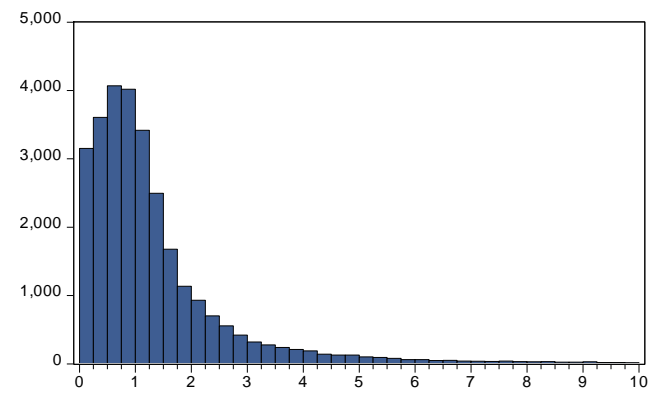


For the period 2013-2015, the distribution of the enterprises per examined ratio based on the implemented boundaries is as follows:

Liquidity

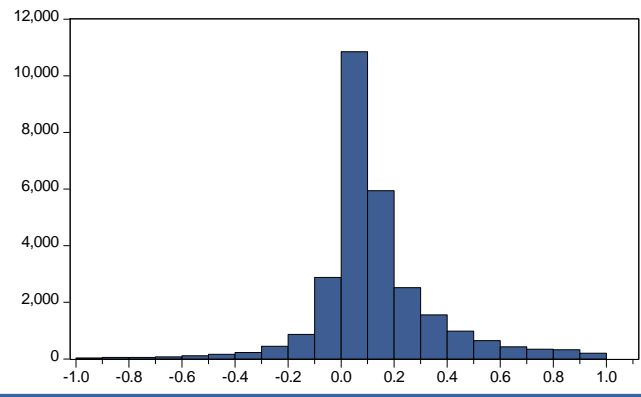


Series:	Current ratio
Sample	28717
Observations	28717
Mean	1.932033
Median	1.413653
Maximum	14.99756
Minimum	0.002237
Std. Dev.	1.769645
Skewness	2.728749
Kurtosis	12.88059
Jarque-Bera	152451.8
Probability	0.000000

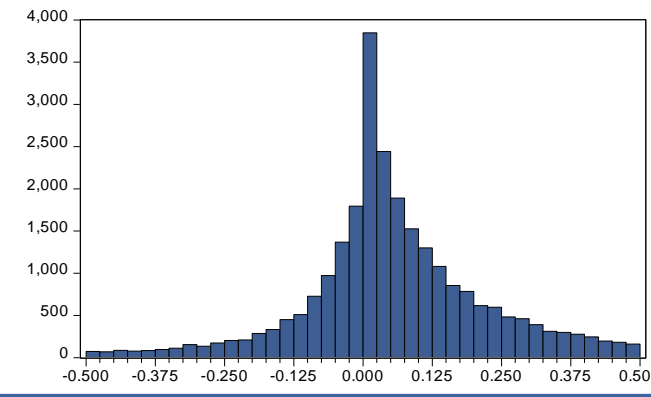


Series:	Quick ratio
Sample	28717
Observations	28717
Mean	1.341537
Median	0.968957
Maximum	9.971817
Minimum	6.97e-05
Std. Dev.	1.368725
Skewness	2.666894
Kurtosis	12.23342
Jarque-Bera	136053.3
Probability	0.000000

Profitability



Series:	EBITDA margin
Sample	28717
Observations	28717
Mean	0.127122
Median	0.086198
Maximum	1.000000
Minimum	-0.992609
Std. Dev.	0.228255
Skewness	0.473555
Kurtosis	6.720730
Jarque-Bera	17638.05
Probability	0.000000



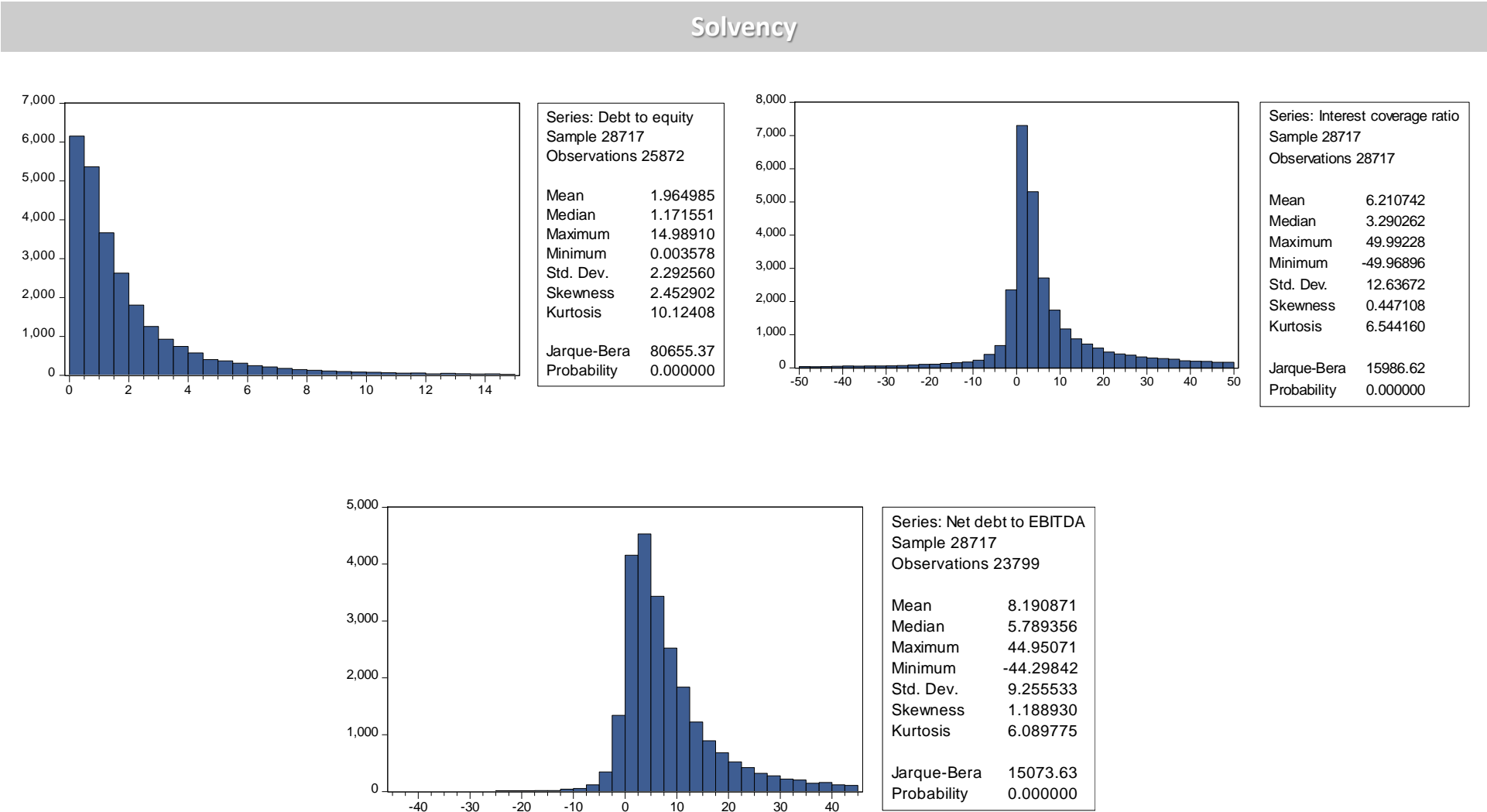
Series:	Return on equity
Sample	28717
Observations	25872
Mean	0.054148
Median	0.035858
Maximum	0.499945
Minimum	-0.499515
Std. Dev.	0.162482
Skewness	-0.043749
Kurtosis	4.081955
Jarque-Bera	1270.188
Probability	0.000000



Appendix I: Enterprise distribution per ratio (II)



For the period 2013-2015, the distribution of the enterprises per examined ratio based on the implemented boundaries is as follows:



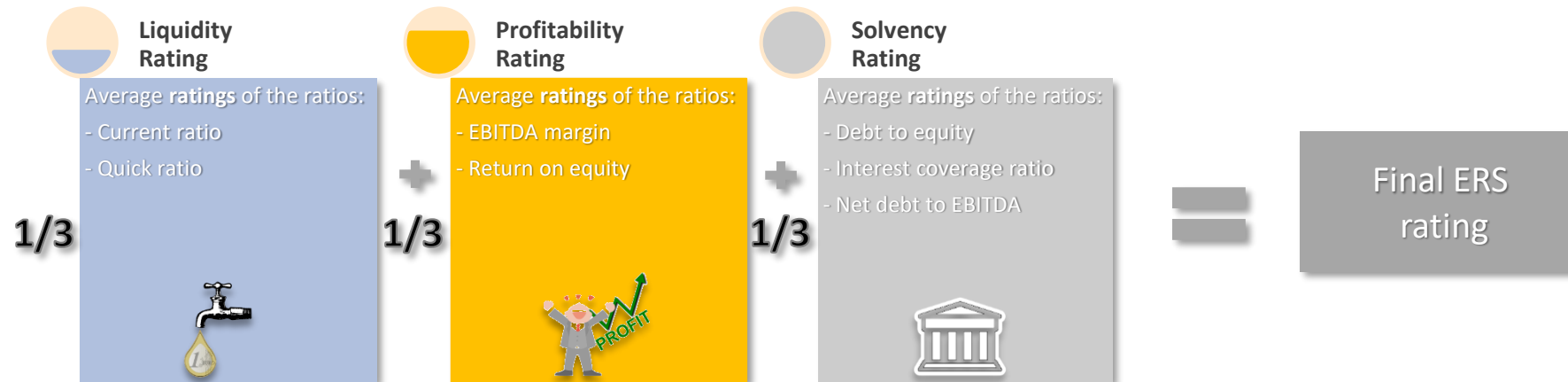
Appendix I: Presentation of ERS (Enterprise Rating System)

The aforementioned enterprises were divided into four groups (quartiles) based on the final enterprise distributions per ratio and a rating system for enterprises was created based on their financial performance. The results of the Enterprise Rating System (ERS) are presented below:

Enterprise Rating System (ERS)

Rating	Performance	Percentile	Current ratio	Quick ratio	EBITDA margin	Return on equity*	Debt to equity*	Interest coverage ratio	Net debt to EBITDA*
a	outperformers	≥ 75	≥ 2.25	≥ 1.61	≥ 19.60%	≥ 13.60%	≤ 0.53	≥ 9.31	≤ 2.39
b	good performers	50	[1.41-2.25)	[0.97-1.61)	[8.63%-19.60%)	[3.60%-13.60%)	(0.53-1.17]	[3.30-9.31)	(2.39-5.80]
c	medium performers	25	[0.96-1.41)	[0.53-0.97)	[2.80%-8.63%)	[-1.97%-3.60%)	(1.17-2.44]	[1.19-3.30)	(5.80-11.51]
d	underperformers	<25	< 0.96	< 0.53	< 2.80%	< -1.97%	> 2.44	< 1.19	> 11.51

* The enterprises with negative equity are rated with “d” for the ratios “return on equity” and “debt to equity” and the enterprises with negative EBITDA are rated with “d” for the ratio “net debt to EBITDA”.

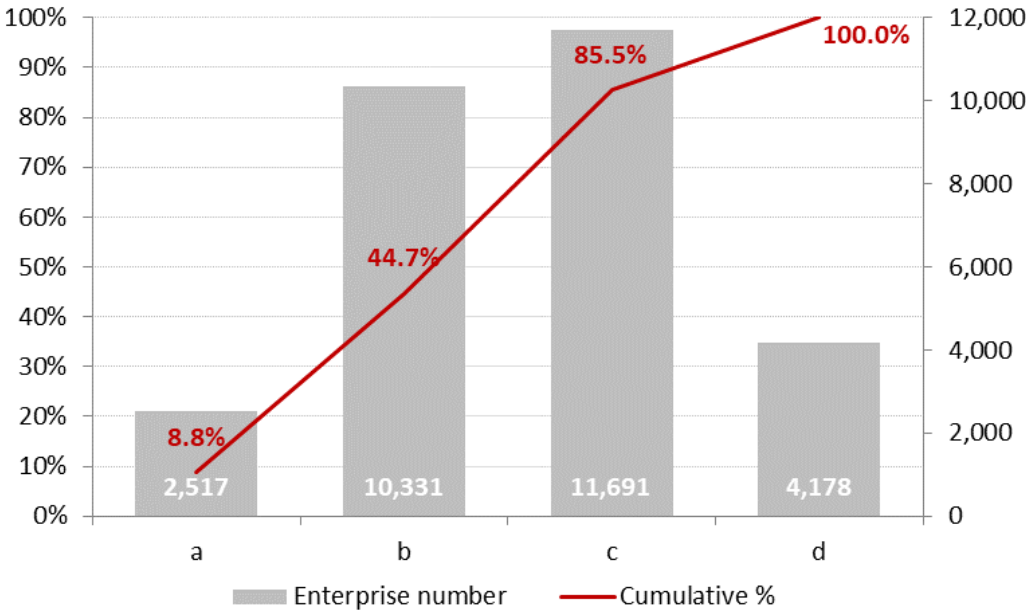


Appendix I: Presentation of ERS (Enterprise Rating System)

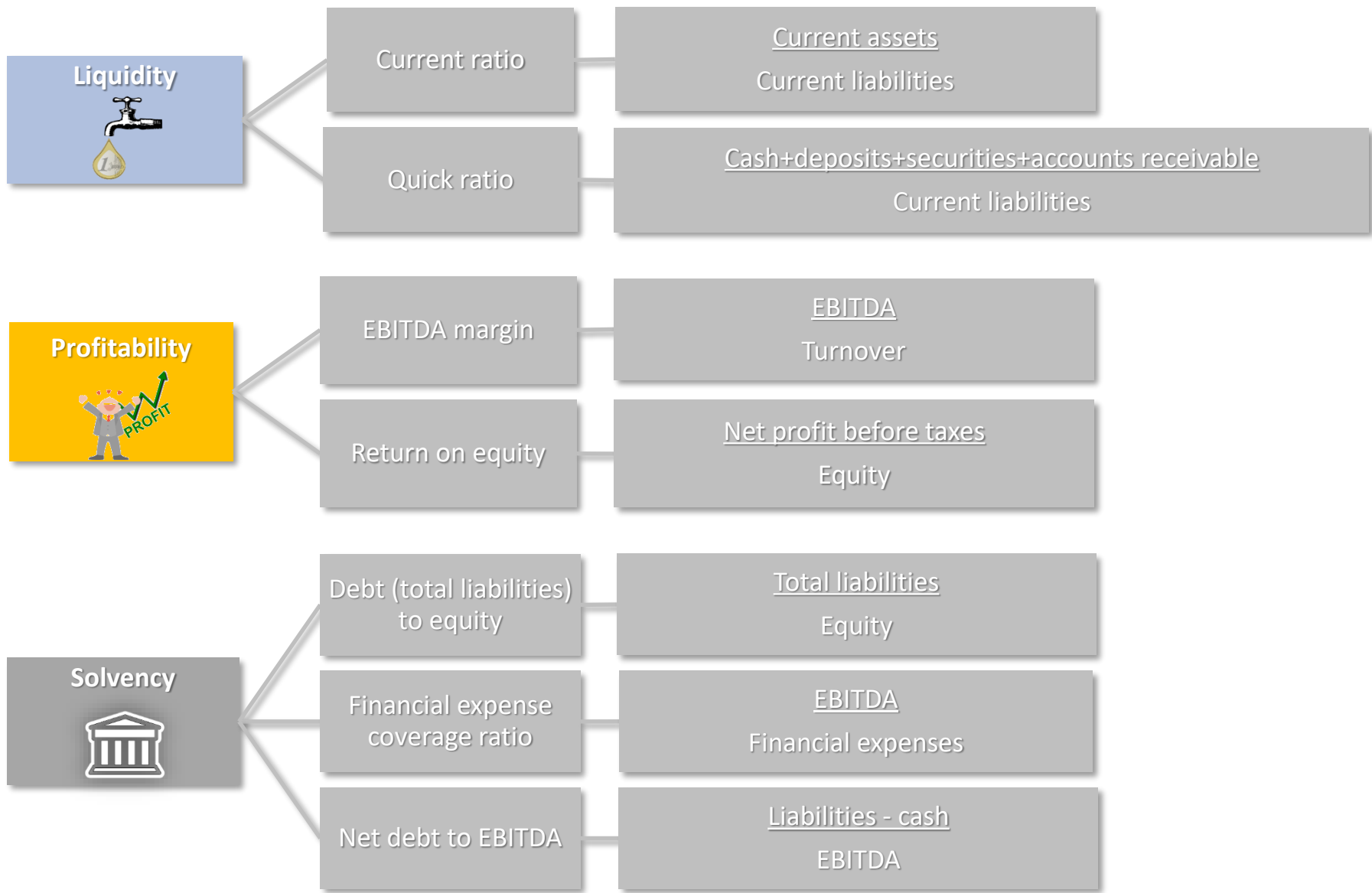


Based on the four ERS grade rating scales, for the period 2013-2015 enterprises can be classified as follows:

Enterprise distribution and cumulative percentages, 2013-2015 based on the Enterprise Rating System (ERS)



Appendix I: Examined ratio formulas



Appendix II: Methodological framework for identifying eligible enterprises for extra funding (I)



- ✓ We defined as the initial potential universe the enterprises that outperform or well perform; in other words, they are rated "a" or "b".
- ✓ Then we excluded firms with a solvency rating of "d" and negative equity, which signaled overleverage.
- ✓ Finally, we excluded firms with negative EBITDA, which is a signal of poor profit performance and consequently poor debt service.
- ✓ We divide our sample into four discrete categories based on their sizes, since the cost of financing differs on account of size class. By adopting the size boundaries in line with the definition of SMEs given by the European Commission (Commission Recommendation 2003/361/EC) for turnover, the following definitions apply:

Enterprise size classes

Size class	Annual turnover
Micro	≤€2 mn
Small	(€2 mn, €10 mn]
Medium-sized	(€10 mn, €50 mn]
Large	>€50 mn

- ✓ The interest coverage ratio is the next tool we use to find out if a company can meet its financial obligations based on its operating profits. The implemented threshold is the 25th percentile of the interest coverage ratio distribution for each size class, without the excluded firms from the previous steps. Each firm with an equal or higher ratio than the threshold of its class is eligible for extra finance.

Implemented interest coverage ratio (ICR) by size class, 2019
(25th percentile of distribution of each size class)

Size class	ICR
Micro	5.62
Small	6.33
Medium-sized	6.37
Large	6.39



Appendix II: Methodological framework for identifying eligible enterprises for extra funding (II)



- ✓ As we said before, we did not want to harm the capital structure of the firms. The main idea behind the simulation scenario is that the possible extra loans won't change their capital structure much. We set level "1" as the ceiling of liabilities to equity ratios so that the liabilities would not exceed the equity level. We used total liabilities as our comparison measure because we wanted to take into account any kind of financing of assets other than equity.

$$\text{Actual total liabilities to equity ratio ceiling} < 1$$

- ✓ The maximum potential extent of the loan is:

$$\text{extra potential lending} = \text{actual equity} - \text{actual liabilities}.$$

- ✓ Then, we calculated the *theoretical total liabilities* = *actual liabilities* + *extra potential lending*
- ✓ We estimated a new theoretical liabilities to equity ratio, which is:

$$\text{New theoretical liabilities to equity ratio} = \frac{\text{theoretical total liabilities}}{\text{actual equity}}$$

- ✓ We excluded the corporations that did not meet the implemented ratio ceiling and had a ratio higher than 1.
- ✓ Finally, we recalculated the theoretical new ratings based on the theoretical new liabilities-to-equity ratio and the new notional solvency rating by implementing our ERS methodology.

$$\text{Recalculation of new notional solvency rating} \rightarrow \text{Estimation of theoretical new final ratings}$$

- ✓ Our intention is to not downgrade the enterprises that go for more lending, so the final bankable corporate universe includes only firms with theoretical ratings of "a" and "b" as in our initial screening steps of our sample.

$$\text{Finally eligible subset of enterprises} \rightarrow \text{the ones with theoretical final ratings "a" and "b"}.$$





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