PIRAEUS BANK

How much do Greek non-viable enterprises cost:
Findings from an enterprise restructuring simulation exercise

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ECONOMIC RESEARCH AND INVESTMENT STRATEGY

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1. Purpose of the study | key findings

Purpose of the study

The prolonged and deep economic recession has had an immense impact on the profitability of the Greek corporate sector, which in turn led to a steep increase in non-performing loans and consequently to the creation of a whole "generation" of non-viable or "zombie" firms. **In the past**, all the attempts to address the problem either from the Greek state or from the banking system have been timid or fragmented, resulting –in most cases – in **generating vicious cycles of forbearance and evergreening which kept alive a substantial number of enterprises without any realistic hope of recovery**.

However, **maintaining a significant percentage of non-viable corporations in operation entails significant costs** not only for the business and the banking sectors but for the entire economy as well. This happens because, as **non-viable enterprises operate with low levels of productivity**, they lower the productivity of the whole economy. In addition, as long as **they remain alive, they trap production factors** (capital and labour), thus **preventing the expansion of viable enterprises**. At the same time, as they do not operate on purely profit maximisation criteria, they "contaminate" the profitability of the rest of the economy. Finally, **non-performing loans** burden the profitability and capital adequacy of banks, **restrict the financing of viable enterprises and increase the cost of funding for the entire economy**.

As the conditions for more radical and long-term solutions to the problems of the domestic entrepreneurship seem to mature, at the same time there is a more urgent **need to assess the potential benefit** that can be gained for all stakeholders from a **large-scale restructuring programme of Greek non-viable enterprises**.

Purpose of the study

This need is addressed in the present study, which attempts to **assess the potential benefits of restructuring non-viable enterprises** as follows:

As a first step, **the Greek corporate sector is divided into viable and non-viable enterprises and their distinct performance is estimated** in terms of profitability, capital structure and liabilities.

Having defined the two distinct populations of (viable and non-viable) enterprises, we then proceed by **simulating the outcome (in terms of profitability, turnover and "curing" of liabilities) that would result from a theoretical business restructuring programme**, where non-viable enterprises are resolved and their assets (and part of their liabilities) are absorbed by viable companies of similar size and average (for their size) performance.

A key assumption of the simulation scenario is that the percentage of the liabilities that will be transferred to the viable corporates will be such that will not alter their pre-absorption balance sheet structure (i.e. the viable companies' liabilities/total assets ratio will remain the same in both pre- and post-absorption states). **The part of the liabilities that will be transferred will become performing/current again**, providing an indication of the non-performing liabilities curing rate. The **remaining part of the liabilities that will be left behind will have to be written-off**, thus providing an estimate of the restructuring costs to the creditors of non-viable enterprises.

Key findings (I): Characteristics of non-viable enterprises

Starting from a very conservative definition, according to which **a non-viable enterprise is an enterprise that is in operation for at least five (5)** – in order to exclude the start-ups – and **for three (3) consecutive years** its profitability levels are so low that they are insufficient to cover current interest expenses (i.e. in technical terms, **the financial expense coverage ratio is less than one**). Based on the above, the following conclusions can be reached:

- **Non-viable enterprises account for 7.1%** of the total sample in 2016. The percentage of non-viable enterprises aged between 21 and 40 years is particular high (37.8%).
- Most non-viable enterprises **(8.2%)** are **micro enterprises**, followed by **medium-sized (6%)** and **small (5.2%) enterprises**, while the lowest percentage **(4.4%)** is recorded amongst **large enterprises**. However, because of their size, the economic impact of large non-viable enterprises is significantly higher compared to that of other size cohorts.
- **Trapped** in non-viable enterprises is productive capacity (as reflected by their **asset** value) amounting to **€28.4 bn**, which equals to **16.3% of GDP**.
- Accordingly, non-viable enterprises have undertaken **€23.5 bn liabilities or 22.6% of the total liabilities** (which by and large are non-performing) and have **€613 mn of annual financial expenses**.
- On average, **viable enterprises do not have very high liabilities to assets ratio (56.1%)**, whereas **non-viable enterprises** have a **significantly higher** ratio (**82.6%**).
- The results of non-viable businesses at **EBITDA level amount to €-413 mn**, while at the level **before taxes they reach €-1.3 bn**. Thus, **the EBITDA margin** stands at **-10.3%** and the **return on assets (ROA) at -1.5%**.

Key findings (II): Benefits from viable enterprises absorbing non-viable ones

The fact that more than 16.5% of the total productive capacity (assets) of the non-financial sector of the Greek economy is trapped in non-viable business schemes presents a **huge cost not only for the enterprises themselves and their creditors (suppliers, banks, public state bodies, etc.) but for the whole community as well.**

The methodology developed to assess the potential benefit from a restructuring programme for non-viable enterprises is a **simulation exercise** according to which the **total assets and a part of liabilities of the enterprises identified as non-viable are absorbed by viable enterprises** of similar size. The results of this exercise show that:

- The **potential** profitability **(EBITDA) increase is €2.6 bn**.
- The **potential operating revenue increase** is estimated at **€16.7 bn**.
- The **liabilities that** – through their takeover by viable enterprises – **could be repaid again** amount to **€15.9 bn**.
- The cost of restructuring in terms of **"haircutting" part of the liabilities** – that will not be transferred to the viable enterprises – is estimated at **€7.6 bn**.

Summary of resolution simulation results: Viable enterprises absorbing non-viable ones

	Micro	Small	Medium-sized	Large	Total
Assets under absorption	€2.3 bn	€2 bn	€9.1 bn	€15.1 bn	€28.4 bn
Potential EBITDA increase	€239.2 mn	€260.4 mn	€883 mn	€1.2 bn	€2.6 bn
Potential operating revenue increase	€618.6 mn	€835.2 mn	€5.6 bn	€9.7 bn	€16.7 bn
"Curing" of liabilities	€1.2 bn	€1.2 bn	€5.1 bn	€8.5 bn	€15.9 bn
"Haircut" of liabilities	€937.2 mn	€675.7 mn	€964.4 mn	€5 bn	€7.6 bn
% of "haircut"	44.7%	36.9%	15.9%	37.1%	32.3%
Change in equity after absorption	€937.2 mn	€675.7 mn	€964.4 mn	€5 bn	€7.6 bn

Source: Piraeus Bank Research, ICAP DATA

2. Methodology for identifying non-viable enterprises

Enterprise sample selection

For the purpose of this analysis, **all enterprises, both SA and LTD,** were examined, without any size criteria. Furthermore, **all non-financial sectors** of economic activity were examined according to the **NACE rev. 2** classification, except for the following:

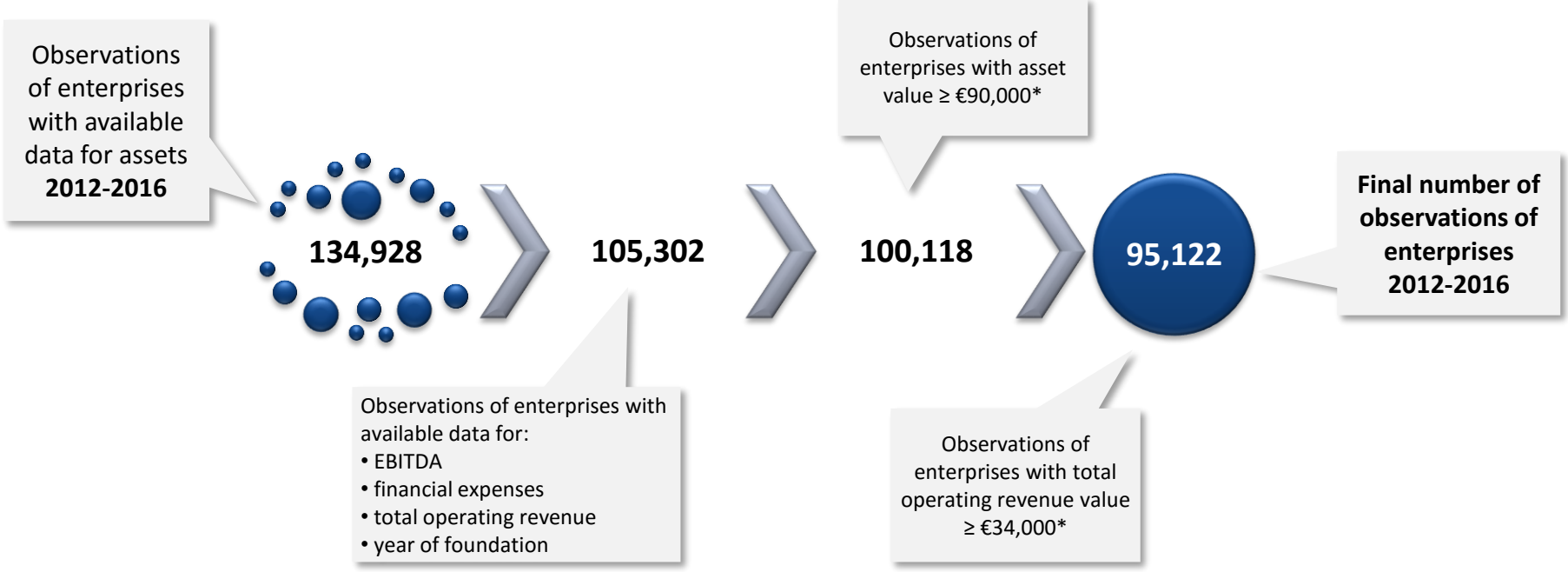
K: Financial and insurance activities

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

Source / date of financial data extract: ICAP DATA / March 2018



* Based on the criterion > 5th percentile of the observation distribution, the respective value thresholds applied to assets and operating revenue.

Definitions of non-viable enterprises and enterprise size cohorts

Non-viable enterprise

An enterprise is non-viable when it satisfies two criteria*:

– for three (3) consecutive years, EBITDA is not enough to cover the financial expenses. That is, financial expense coverage ratio is less than one (≤1).

– it is not a start-up. Therefore, an age limit of the enterprise was set to be five (5) years or older.

Enterprise size cohorts

By adopting the size limits in line with the definition of SMEs given by the European Commission (Commission Recommendation 2003/361/EC), not for the turnover, but for total operating revenue, the following definitions apply:

– **micro:** an enterprise with annual operating revenue up to two mn euros (≤€2 mn),

– **small:** an enterprise with annual operating revenue between two and ten mn euros (€2 mn, €10 mn],

– **medium-sized:** an enterprise with annual operating revenue between ten and 50 mn euros (€10 mn, €50 mn] and,

– **large:** an enterprise with annual operating revenue exceeding 50 mn euros (>€50 mn)

* Similar approaches, but with higher enterprise age limits, have been applied in international studies, e.g. OECD. Indicative literature:

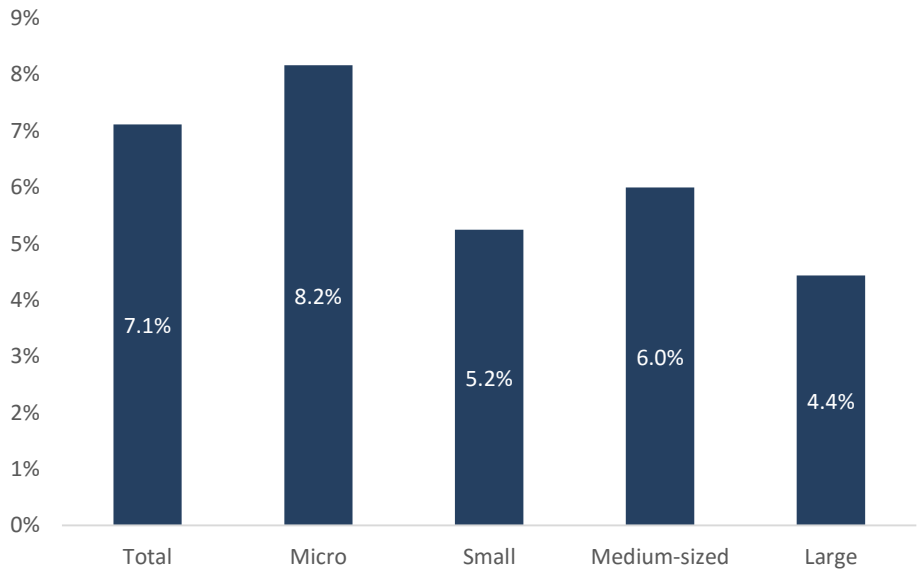
- Adalat McGowan, Andrews and Millot (2017), The Walking Dead? Zombie firms and productivity performance in OECD countries, Economics Department Working Papers No. 1372, OECD, January 2017
- Adalat McGowan, Andrews and Millot (2017), Insolvency regimes, zombie firms and capital reallocation, Economics Department Working Papers No. 1399, OECD, June 2017

3. Mapping Greek entrepreneurship: non-viable vs. viable enterprises

Mapping Greek entrepreneurship (I): Non-viable enterprises accounted for 7.1% of total enterprises in 2016

- **In 2016, out of a sample of 11,165 enterprises, 794 are characterised as non-viable (7.1% of the total sample)**, i.e. they have financial expenses coverage ratio less than one for three consecutive years and are at least five years in operation.
- Most non-viable enterprises **(8.2%)** are **micro enterprises**, followed by **medium-sized (6%)** and **small (5.2%) enterprises**, while the lowest percentage **(4.4%)** is recorded in the **large enterprises**. However, because of their size, the economic impact of the large non-viable enterprises is significantly higher than the other size cohorts.

Shares of non-viable enterprises to total, by size cohort, 2016

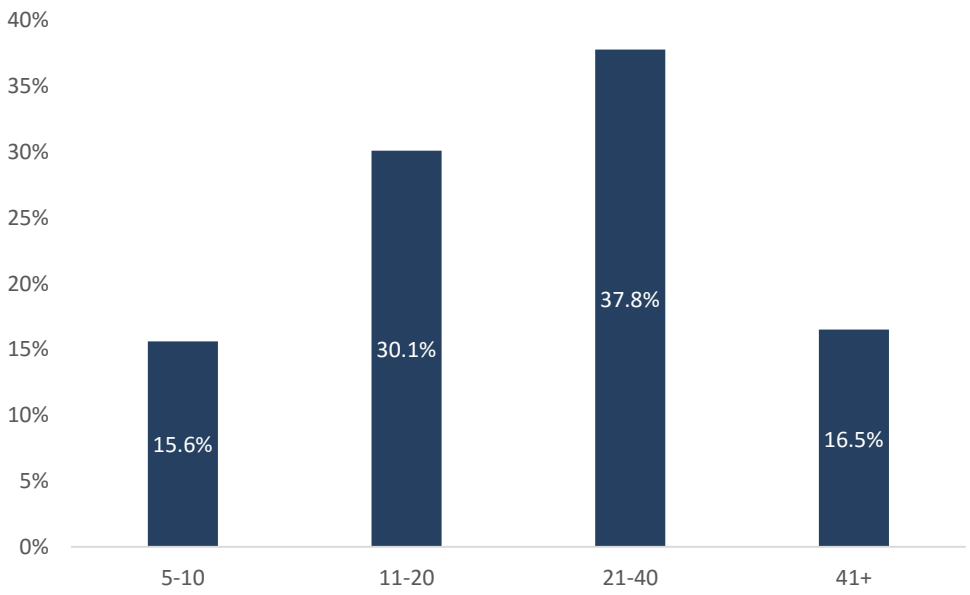


Source: Piraeus Bank Research, ICAP DATA

Mapping Greek entrepreneurship (II): Older enterprises are the most at risk

- **The established enterprises** – older than 11 years old – exhibit **increasingly higher difficulty in servicing their financial obligations**, and potentially have viability problems, based on the criterion that the financial expense coverage ratio is less than one for three consecutive years.
- **The percentage** of non-viable enterprises aged **between 21 and 40 years is particular high (37.8%)**.

Shares of non-viable enterprises by age cohort, 2016

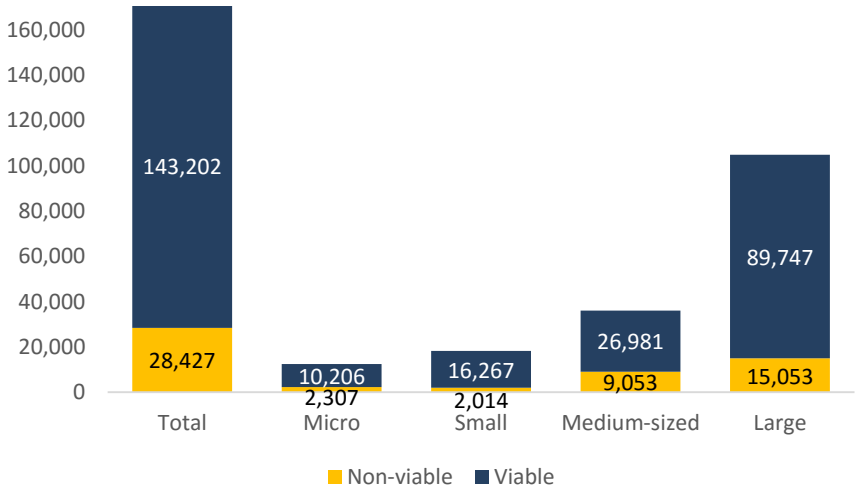


Source: Piraeus Bank Research, ICAP DATA

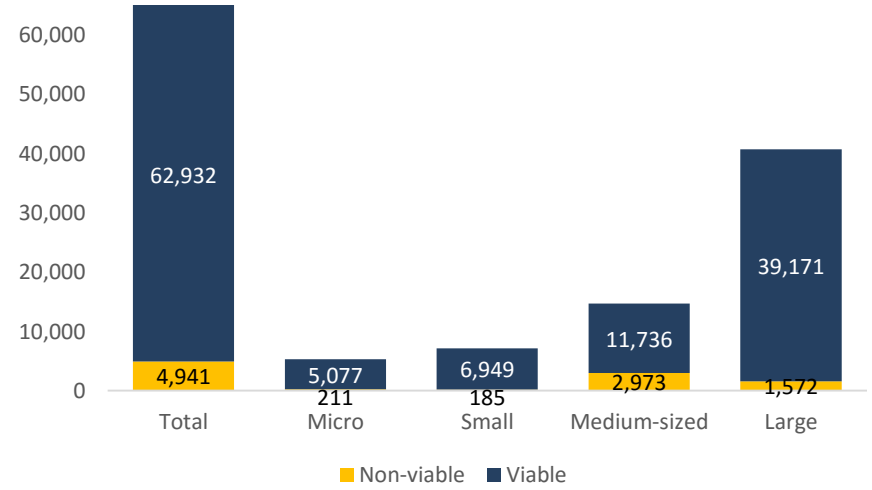
Mapping Greek entrepreneurship (III): €28.4 bn of assets and €4.9 bn of equity sunk in non-viable enterprises

- **€28.4 bn assets are trapped in non-viable enterprises**, a value **equivalent to 16.6% of total** assets in our sample in 2016.
- **In terms of asset value, the highest concentration of non-viable enterprises is concentrated in the large and medium-sized cohort**.
- The **equity of non-viable enterprises** amounts to **€4.9 bn** in total, which accounts for **only 7.3%** of the total equity in our sample.
- **Small non-viable enterprises** have the lowest **equity** value **of just €185 mn, followed by the micro ones with € 211 mn**.
- **Medium-sized enterprises** have the highest value of **equity** among the size classes of non-viable enterprises, reaching **€3 bn**.
- The **equity of large non-viable enterprises is €1.6 bn**, **accounting for just 3.9%** of the equity of all large enterprises.

Assets, 2016 (in mn euros)



Equity, 2016 (in mn euros)

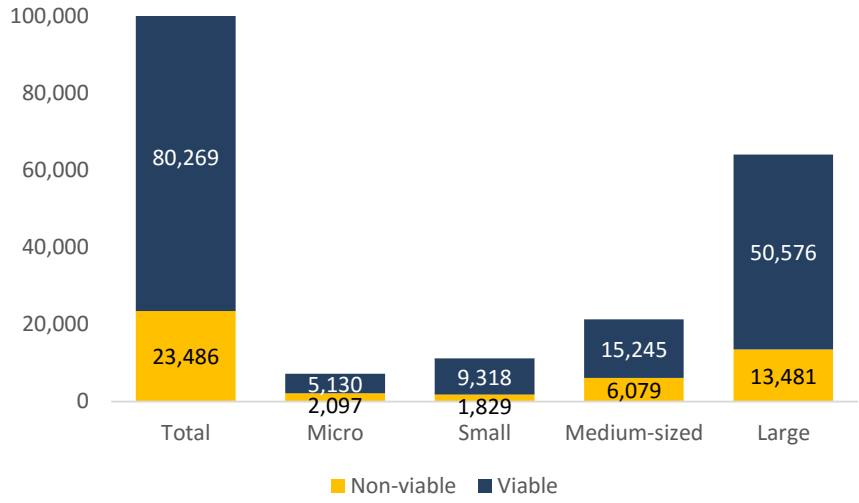


Source: Piraeus Bank Research, ICAP DATA

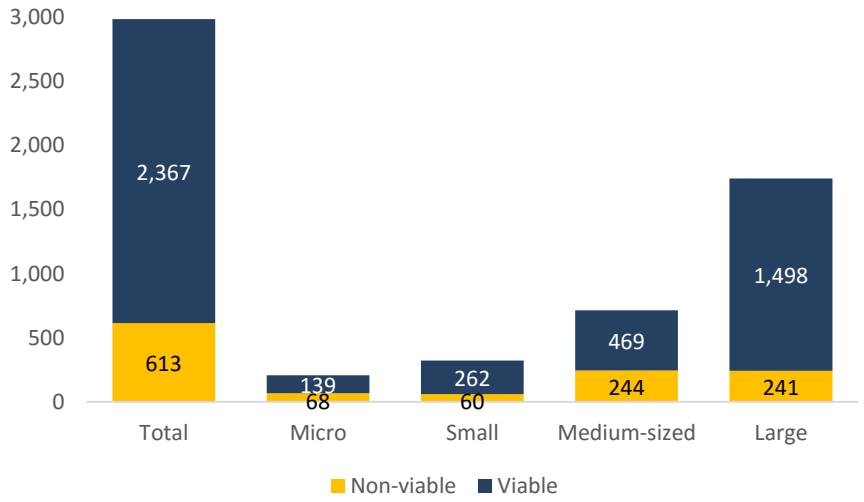
Mapping Greek entrepreneurship (IV): non-viable enterprises have undertaken €23.5 bn liabilities and have to service €613 mn of financial expenses

- **Non-viable enterprises** have undertaken **€23.5 bn liabilities or 22.6%** of the total.
- Out of the €23.5 bn total liabilities of non-viable enterprises, **the largest amount** (€13.5 bn) **are liabilities held by large** enterprises.
- **Non-viable enterprises** have to service **€613 mn financial expenses**, which represents **20.6%** of the financial expenses of all enterprises in our sample.
- **Medium-sized and large non-viable enterprises** have the **highest** financial expenses amounting to **€244 mn and €241 mn** respectively.

Total liabilities, 2016 (in mn euros)



Financial expenses, 2016 (in mn euros)

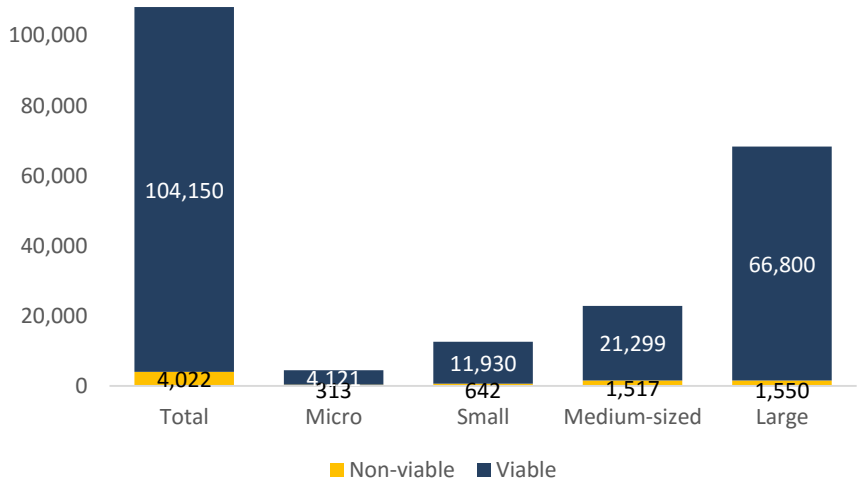


Source: Piraeus Bank Research, ICAP DATA

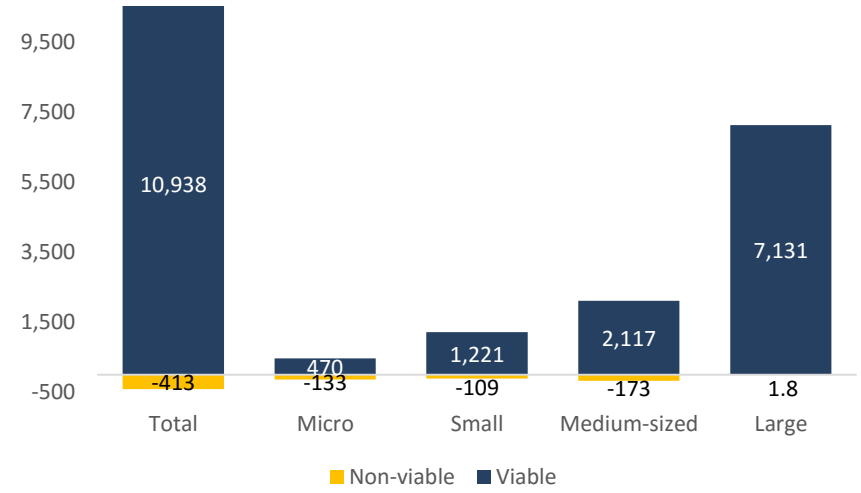
Mapping Greek entrepreneurship (V): non-viable enterprises record only €4 bn operating revenue and €413 mn losses at EBITDA level

- The income statement results reveal the **low efficiency of non-viable enterprises**.
- **Non-viable enterprises** account for **3.7% of total operating revenue, i.e. just €4 bn** when **viable enterprises** earn **€104.2 bn**.
- **In terms of operating revenue the large non-viable enterprises record the worst performance** earning only **2.3% of the cohort's total**.
- At **EBITDA level**, **non-viable enterprises** record **€413 mn losses**, when **viable ones** earn **€11 bn EBITDA profits**.
- **Micro enterprises** have **the worst overall performance** given that **non-viable enterprises record €133 mn** of losses and viable ones earn only **€470 mn of EBITDA profits**.
- **Large non-viable enterprises** is the only size cohort that manages to record (a tiny) profit of **just €1.8 mn EBITDA profits**.

Operating revenue, 2016 (in mn euros)



EBITDA, 2016 (in mn euros)

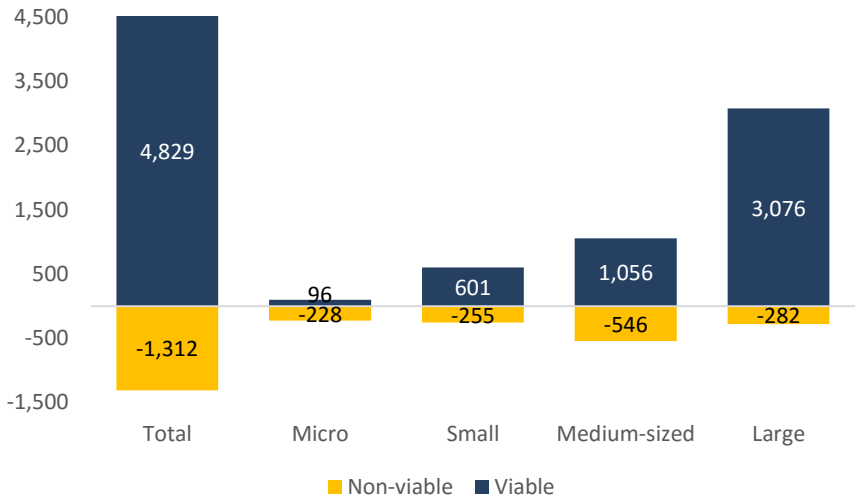


Source: Piraeus Bank Research, ICAP DATA

Mapping Greek entrepreneurship (VI): the losses of non-viable enterprises expand to €1.3 bn in the results before taxes

- **The loss-making performance of non-viable enterprises** is further expanded to **€1.3 bn** when considering the **net results before taxes**.
- **Medium non-viable enterprises** record **the highest losses (€546 mn)** followed by **large** ones (**€282 mn**).
- **The losses before taxes of micro non-viable** enterprises are **so high (€228 mn)** compared to €96 mn profits of viable ones that this size cohort is overall loss making to the tune of **€132.2 mn**.

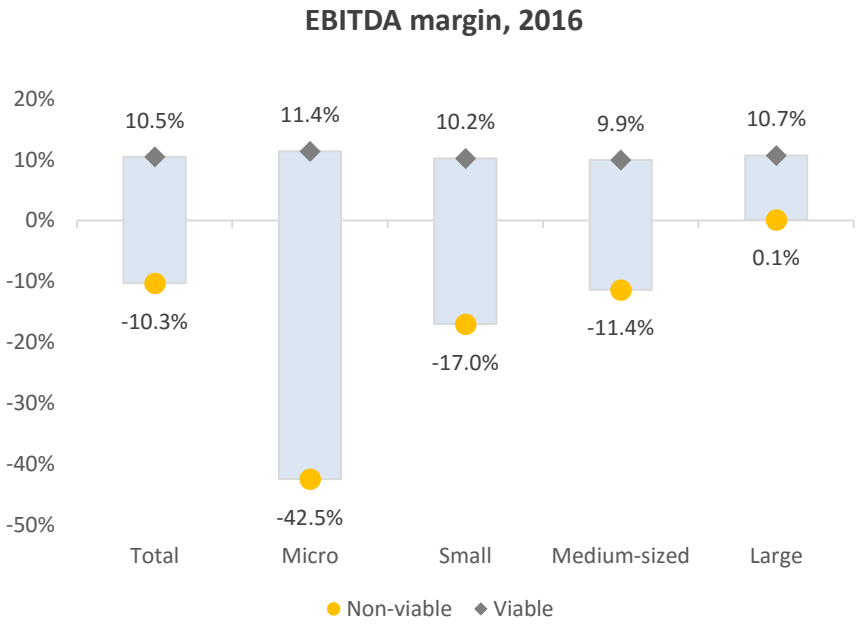
Results before taxes, 2016 (in mn euros)



Source: Piraeus Bank Research, ICAP DATA

Mapping Greek entrepreneurship (VII): -10.3% EBITDA margin for non-viable enterprises versus 10.5% for viable enterprises

- The **average EBITDA margin of non-viable enterprises** stands at **-10.3%**, when **viable enterprises achieve 10.5%** on average.
- The performance gap of **micro enterprises** is high, as at the same time **non-viable** enterprises have the worst average negative profit margin at **-42.5%** and **viable ones** have the highest EBITDA margin **(11.4%)**.
- **As the size of the enterprise grows**, the **underperformace** in terms of profit margins **becomes less pronounced**.
- The **large non-viable enterprises** have a **slightly positive average EBITDA margin (0.1%)**, with the average performance of **viable** large enterprises at **10.7%**.

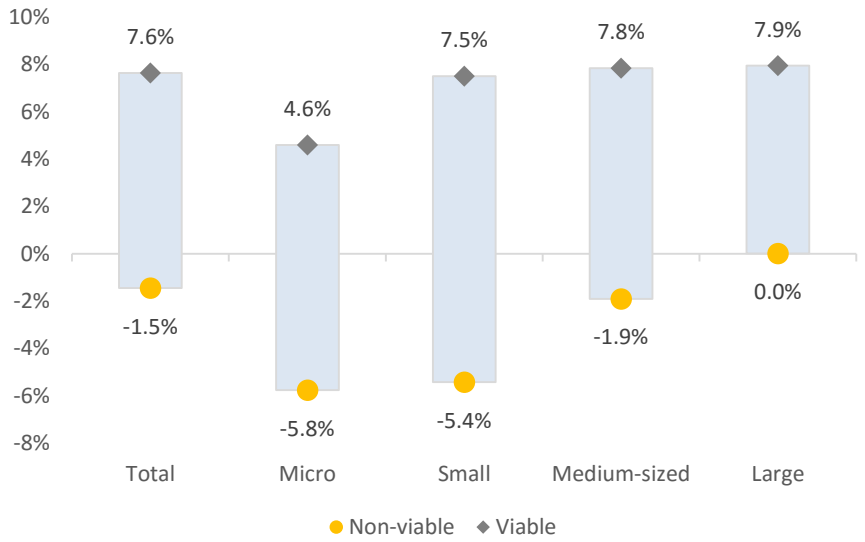


Source: Piraeus Bank Research, ICAP DATA

Mapping Greek entrepreneurship (VIII): -1.5% return on assets for non-viable enterprises versus 7.6% for viable enterprises

- **The efficiency of non-viable** enterprises is **poor**, with their **return on assets at -1.5%**, compared to **7.6%** for **viable enterprises**.
- **The larger the size of the enterprise, the higher** the average operating **return on assets for the viable** enterprises and the **more moderate the negative performance for the non-viable** ones.
- **Large enterprises** is the **only** size cohort with a **slightly positive** average return on assets of the **non-viable** enterprises.

Return on assets based on EBITDA, 2016

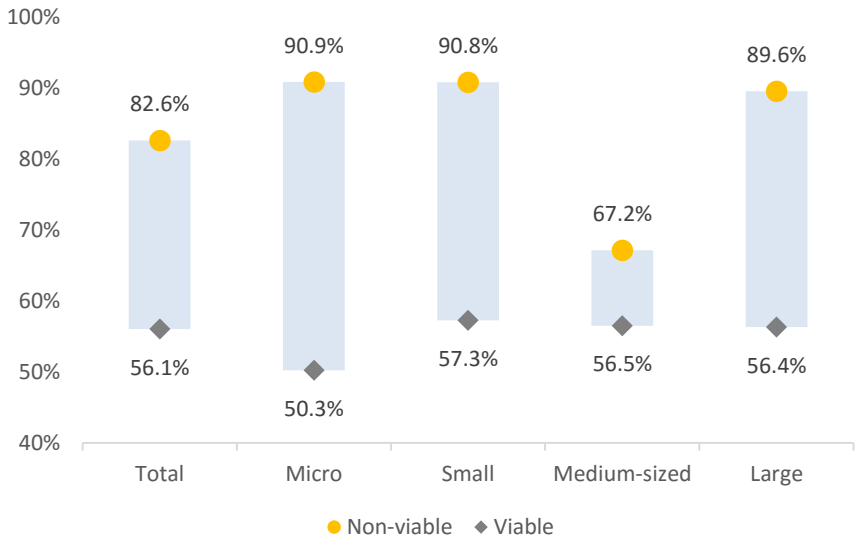


Source: Piraeus Bank Research, ICAP DATA

Mapping Greek entrepreneurship (IX): high leverage of non-viable enterprises, with liabilities amounting to 82.6% of the total assets, significantly worse compared to viable ones that stand at 56.1%

- On average, leverage in viable enterprises is contained with a ratio of **liabilities to assets at 56.1%.** whereas for **non-viable** enterprises it is significantly **higher (82.6%)**.
- **Micro and small non-viable** enterprises seem to finance their assets mainly from liabilities (**90.9% and 90.8%** respectively).
- **Medium-sized non-viable** enterprises have on average a **more moderate leverage at 67.2%.** Compared to the other size cohorts, this category does not deviate much from the respective percentage of viable enterprises (**56.5%**).

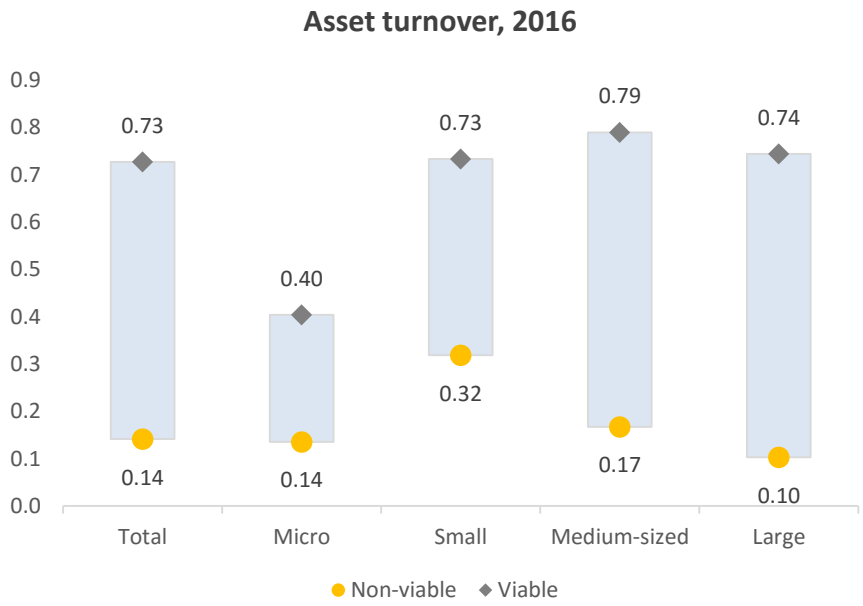
Liabilities to total assets, 2016



Source: Piraeus Bank Research, ICAP DATA

Mapping Greek entrepreneurship (X):
Low asset turnover of viable enterprises (0.14x) versus viable ones (0.73x)

- All **non-viable** enterprises operate with **limited utilisation of their assets**, which on average produce operating revenue only **0.14x**, versus **0.73x in the case of viable** enterprises.
- Among the size categories of **non-viable** enterprises, the **small** ones seem to have **the highest utilisation of their assets** for making operating revenue (**0.32x**). However, this performance is poor compared to **viable** small enterprises **(0.73x)**.
- **The performance of micro enterprises is in general low**, as the asset turnover of **non-viable** enterprises is low (**0.14x**) whereas the one of **viable micro** enterprises is well below the total of viable enterprises (**0.4x**).



Source: Piraeus Bank Research, ICAP DATA

4. Simulation exercise of non-viable enterprises resolution | Impact on financial figures and results

Motivation and outline of the non-viable enterprises' resolution simulation exercise (a)

The fact that **more than 16.5% of the total productive capacity (assets)** of the non-financial sector of the Greek economy **is trapped in non-viable business endeavors presents a huge cost** not only to the enterprises themselves and their creditors (suppliers, banks, public sector entities, etc.) but to the whole society as well.

This cost, inter alia, stems from the fact that the **non-viable enterprises operate with a much lower level of efficiency**. As we have already estimated, the return on assets of the large viable enterprises is 7.9% compared to 0% of the respective non-viable enterprises. At the same time, **the viable enterprises are able to achieve a significantly higher turnover (or in general, operating revenues) than the corresponding non-viable ones.**

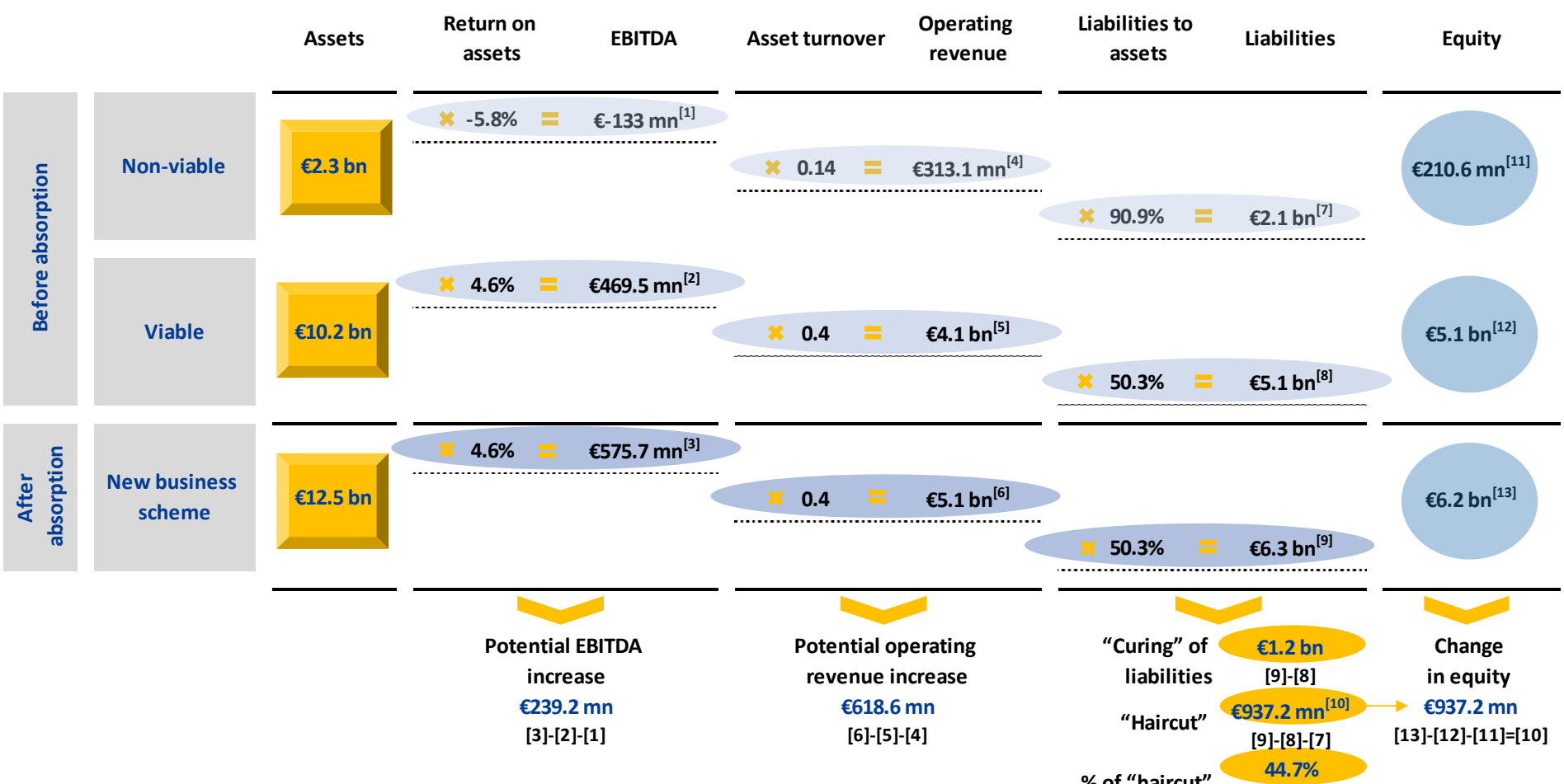
Therefore, a reasonable way of estimating the potential benefit of a large-scale restructuring program for the non-viable enterprises is to **simulate the economic outcome that would result from the resolution of these companies and the absorption of their assets from viable ones of similar size and performance equal to the average performance recorded in their size cohort.** The more rational and efficient use of these assets will lead to an increase of turnover (and generally of operating revenue) and profitability of the entire Greek economy.

Motivation and outline of the non-viable enterprises' resolution simulation exercise (b)

Last but not least, the restructuring of non-viable enterprises will have significant impact on the liabilities' side of their balance sheets. Based on the figures for 2016, **the liabilities of non-viable enterprises (to banks, suppliers, social security funds, etc.) amount to €23.5 bn** in total and to a great extent they are not serviced on time.

As part of the resolution exercise **viable companies will have to undertake part of the non-viable enterprises' liabilities**. **A key assumption of the simulation scenario is that the percentage of the liabilities that will be transferred to the viable corporates will be such that will not alter their pre-absorption balance sheet structure** (i.e. the viable companies' liabilities/total assets ratio will be the same in both pre- and post-absorption states). **The part of the liabilities that will be transferred will become performing/current again**, providing an indication of the non-performing liabilities curing rate. The **remaining part of the liabilities that will be left behind will have to be written-off**, thus providing an estimate of the restructuring costs to the creditors of non-viable corporates enterprises.

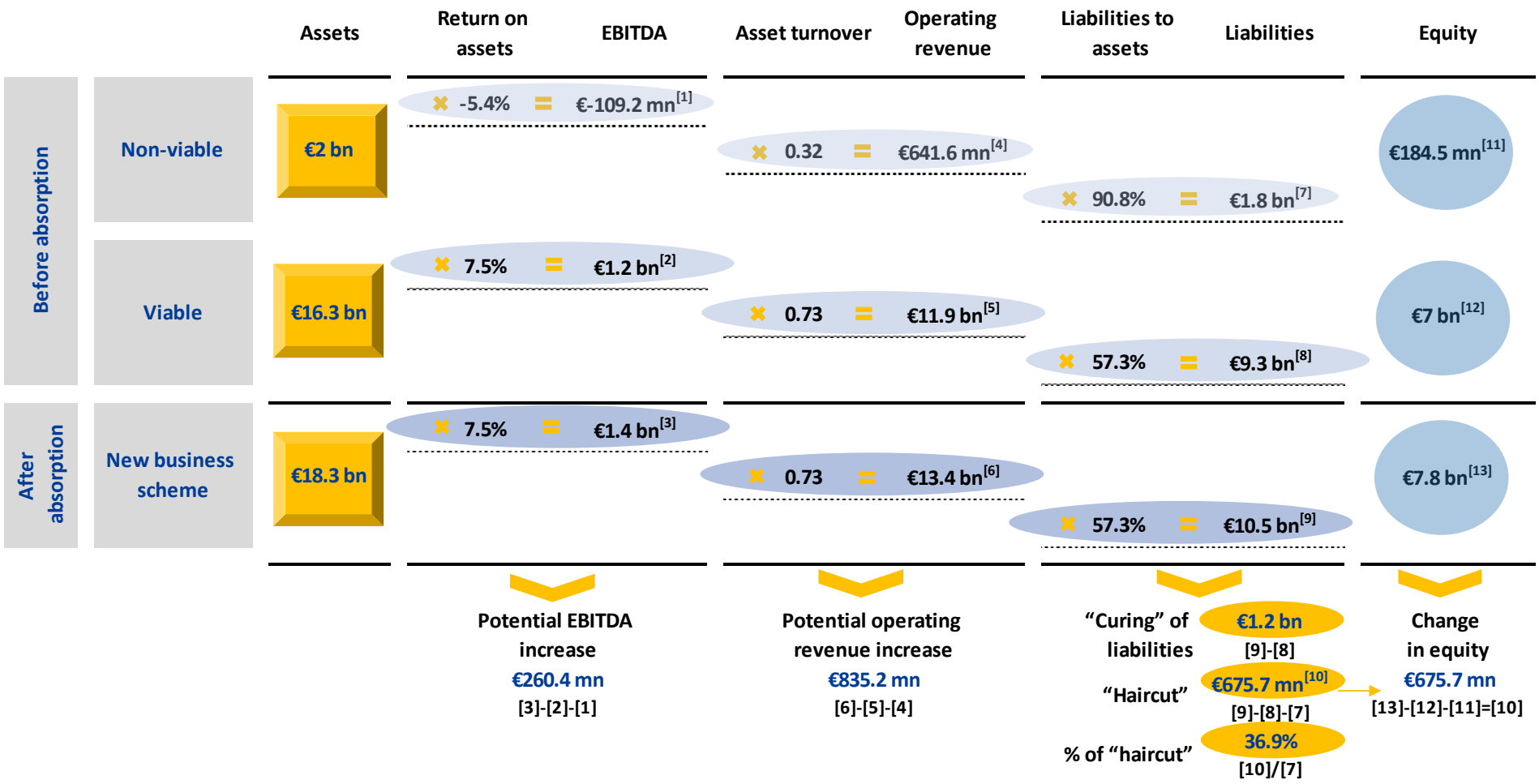
Micro enterprises resolution: Simulation of absorption of €2.3 bn assets of non-viable enterprises by viable ones



Note: Any differences in results are due to rounding

Source: Piraeus Bank Research, ICAP DATA

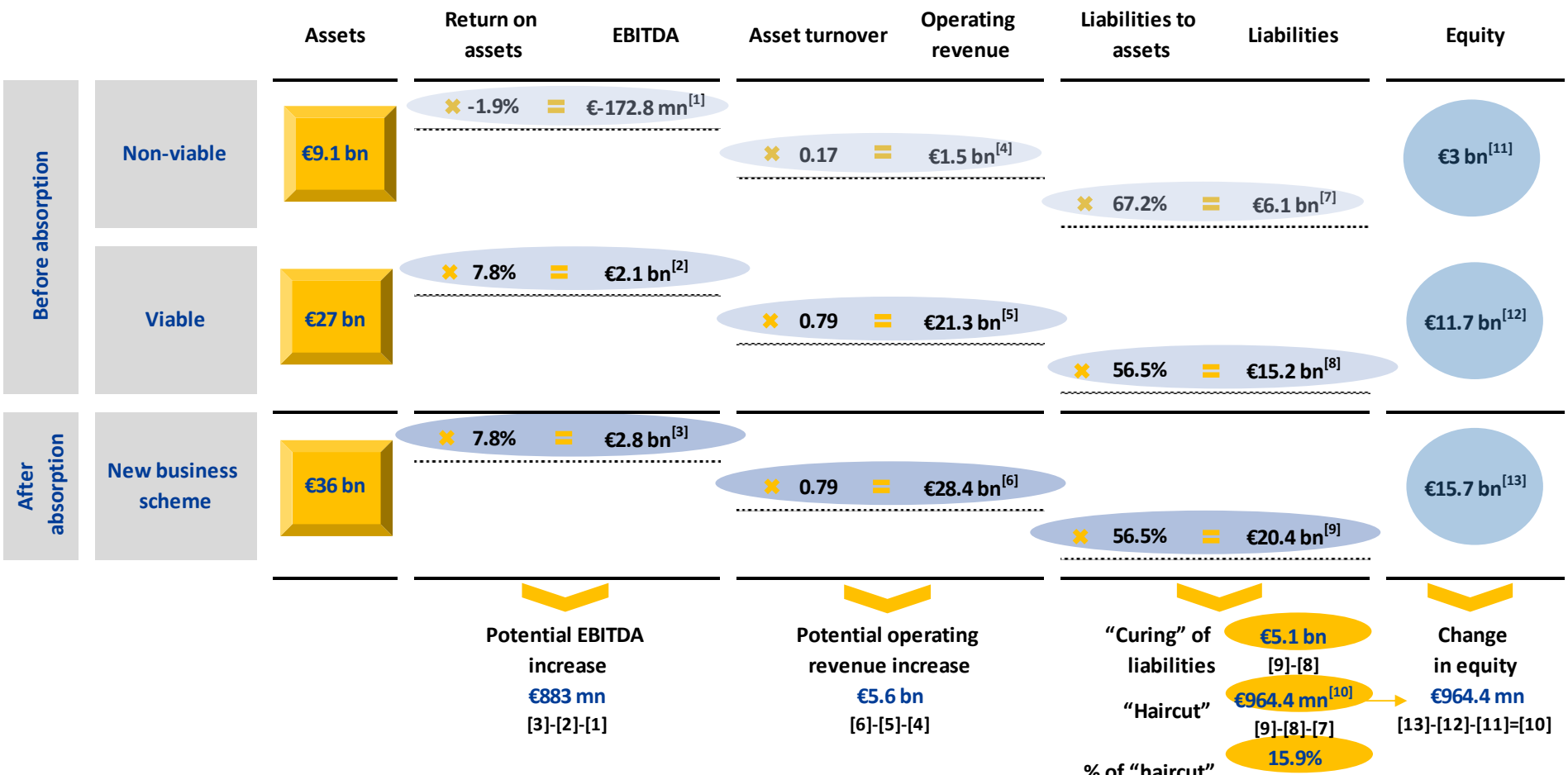
Small enterprises resolution: Simulation of absorption of €2 bn assets of non-viable enterprises by viable ones



Note: Any differences in results are due to rounding

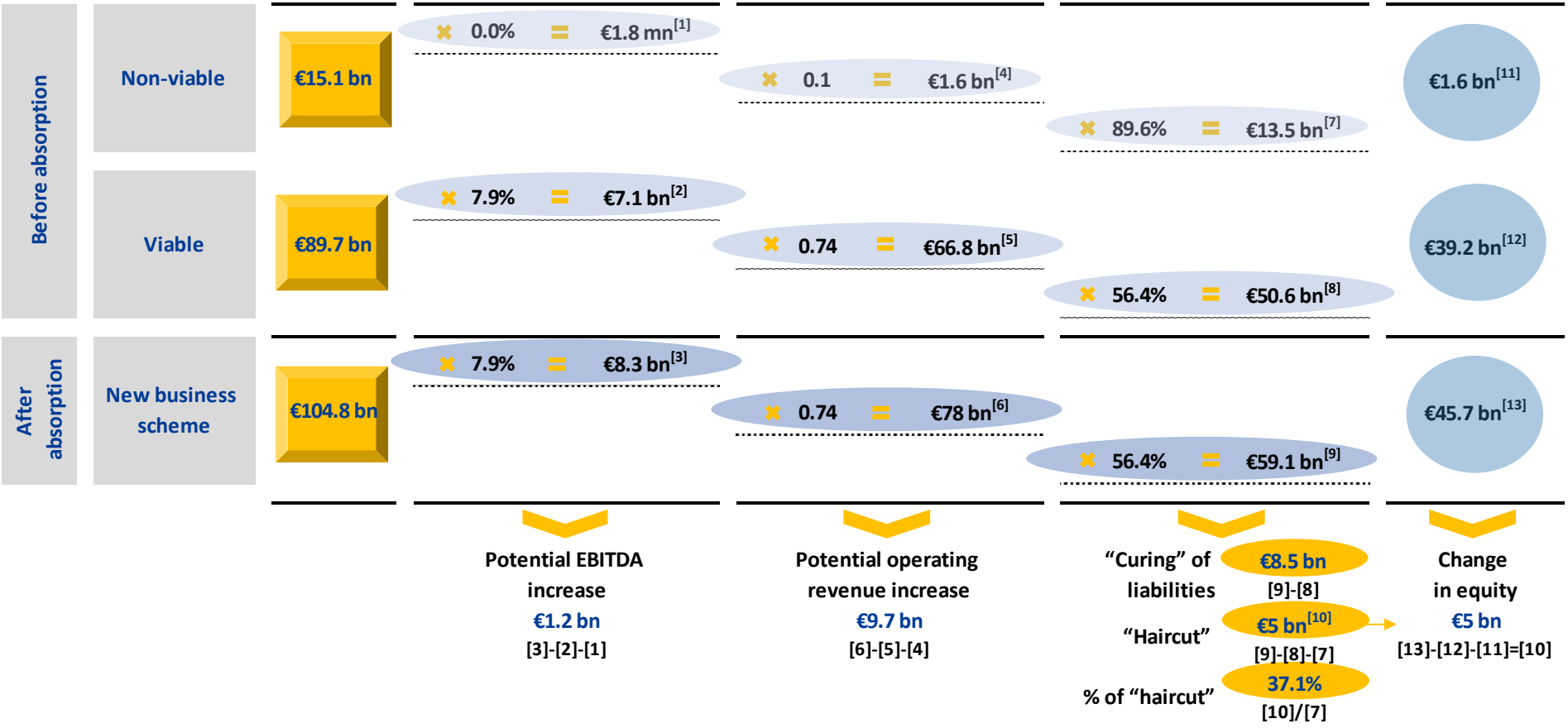
Source: Piraeus Bank Research, ICAP DATA

Medium-sized enterprises resolution: Simulation of absorption of €9.1 bn assets of non-viable enterprises by viable ones



Note: Any differences in results are due to rounding

Large enterprises resolution: Simulation of absorption of €15.1 bn assets of non-viable enterprises by viable ones



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% of "haircut"	44.7%	36.9%	15.9%	37.1%	32.3%
Change in equity after absorption	€937.2 mn	€675.7 mn	€964.4 mn	€5 bn	€7.6 bn

Source: Piraeus Bank Research, ICAP DATA

5. Appendix

Examined ratio formulas

Financial expense coverage ratio	$\frac{\text{EBITDA}}{\text{Financial expenses}}$
EBITDA margin	$\frac{\text{EBITDA}}{\text{Total operating revenue}}$
Return on assets	$\frac{\text{EBITDA}}{\text{Assets}}$
Liabilities to assets	$\frac{\text{Total liabilities}}{\text{Assets}}$
Asset turnover	$\frac{\text{Total operating revenue}}{\text{Assets}}$

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