Revisiting zombie firms

From survival to revival

December 2025

PwC

1

What was examined

Analyse zombies and their link to firm failure

This study examines the **anatomy of the Greek corporate landscape** and the **role of zombie firms** from the **economic recovery** to **Covid-19 crises**.

Our aim is to answer **4 questions:**

01

What are the key characteristics of Greek firms, and what are the special **features that distinguish zombies from healthier firms**?

02

How has the **share of zombie firms** evolved **over time** in Greece?

03

How does the **share of zombie firms** differ by **company size** and across **sectors**?

04

What is the **relationship between zombie firms and firm failure**?

*The analysis took into consideration **previous PwC reports on Stars & Zombies** (published in 2015, 2019 & 2021).

2

Introduction

Greek firms after the sovereign debt and pandemic crises

The following main themes regarding opportunities and challenges faced by Greek firms arise in recent reports from the OECD (2024), the European Commission (2024), and the Bank of Greece (2024).

Opportunities

- Reduced domestic economic and political uncertainty.
- Greece's return to investment grade status since 2023 (S&P, Fitch, Moody's).
- Reduction of Greek sovereign debt from 169% in 2015 to 154% in 2024 as % of GDP.
- Stronger export performance and record-breaking tourism sector.
- Access to RRF funds and resolution of NPLs.
- Increase in investments (gross fixed capital formation) by 81% in 2024 compared to 2015.
- Investments in digital transformation and green initiatives.

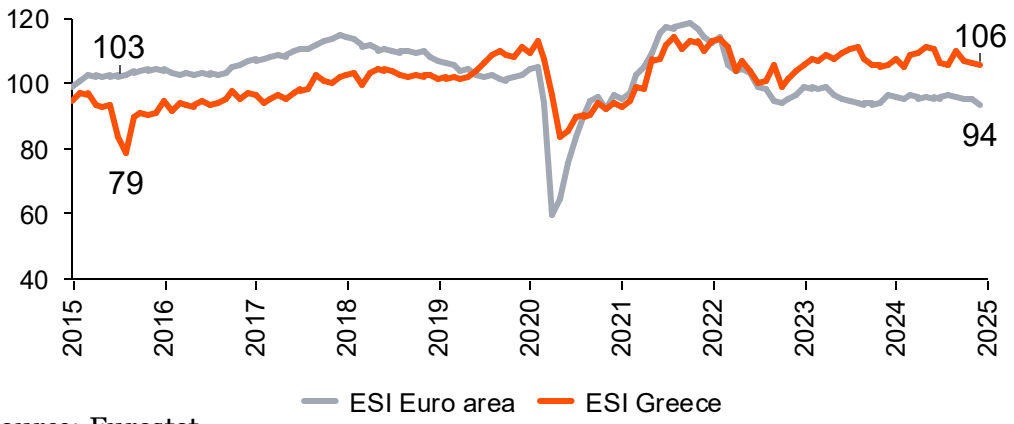
Challenges & external threats

- Low investment and productivity.
- High regulatory burden.
- Large share of micro-firms with limited access to external finance.
- Climate and geopolitical risk; demographic challenge; trade wars.

Improved macro-finance environment and gradual business lending recovery

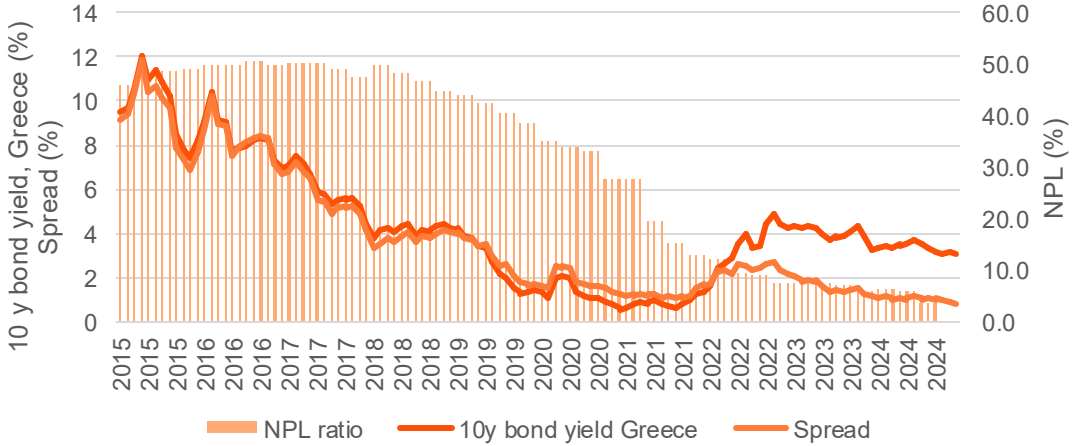
- **Greek firms have low leverage**, as business lending by Greek banks only improved later in the 2015–2023 period.
- Despite a **better economic climate and lower sovereign risk**, banks focused on reducing NPLs.
- This "creditless recovery" follows banking crises, where financial intermediation slows until banks' balance sheets are cleaned.
- The efforts of Greek banks yielded significant results, with business **NPLs dropping below 10%** by April 2022.
- The **sharp decline in the NPL ratio** reflects the success of the "Hercules" government program, which guaranteed NPL securitizations.

Economic Sentiment Indicator



Source: Eurostat

Non-performing business loans ratio*, government bond yield and spread



Source: Bank of Greece, Eurostat, Federal Reserve Bank of St. Louis

*NPLs retained by credit institutions.

3

Research Methodology

Our database

Representation of our sample to total economy

- Listed and private firms are included.
- Coverage is significantly higher for larger firms, given less stringent financial reporting requirements for smaller firms.
- The selected companies represent **75% of revenues** of the total Greek corporate economy (2019-2022).

Greek firm-level financial data extracted from **Orbis database**

To address those questions, we use firm-level data from Orbis (published financial statements), covering **FY2015–FY2023**, a period characterised by the recovery from two major crises.

Sample characteristics

- Fiscal Years examined: 2015-2023
- Initial sample: 31,561 firms
- Final sample: 13,981 firms (average 2015-2023)
- Reporting: Consolidated financial statements

Data cleaning

Excluded sectors: Financial & Insurance, Public Administration, Defense & Social Security

Excluded firms: Firms with a last recorded year before 2014, and those lacking zombie classification.

Methodology - Defining zombie firms

The aim of the study is to identify firms that exhibit persistent financial weakness

There are several alternative definitions in existing studies ranging from low profitability and high leverage to receiving subsidised credit. We built our analysis upon **PwC's previous report (2015) to develop a zombie classification** that differs from commonly used Interest Coverage Ratio (ICR)-based metrics. Zombie firms are identified through a PwC-based metric analysed below, with sensitivity checks using interest coverage ratio measures.

Effectively, the PwC methodology adopts a combination approach, with the key distinction that it does not rely on the ICR but instead on poor performance and either high debt or negative profits. This is particularly important given that the median Greek firm has relatively low leverage. **The PwC methodology appears better suited** to capture the idiosyncratic characteristics of the Greek corporate ecosystem.

Zombies meet all following conditions:

< -5%
CAGR of Turnover
(3-year window)

< 0%
ROCE
(3-year window mean)

> 5 or **< 0**
Net Debt/ EBITDA
EBITDA
(3-year window mean)

For sensitivity analysis, we also use two ICR-based measures.

4

Key characteristics of Greek firms, and the distinguishing features of zombie firms

A typical Greek firm shows low leverage and adequate liquidity

12%
Leverage ratio (Total debt/Total assets)

145%
Liquidity ratio (Current assets/Current liabilities)

5%
Profitability ratio (EBIT/Turnover)

Source: Orbis, PwC analysis

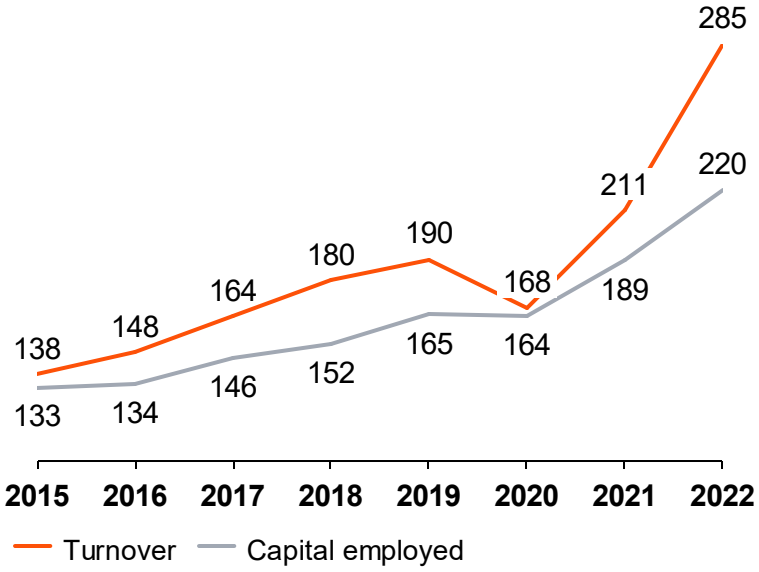
A representative (median) Greek firm has:

Variable	Median
Assets	2.942
Turnover	2.240
EBIT	0.127
Net income	0.063
Profitability (EBIT margin)	5%
Short-term debt	0.040
Long-term debt	0.039
Leverage (Debt/Assets)	12%
Solvency (Equity/Assets)	39%
Liquidity (Current ratio)	145%
Age (years)	19

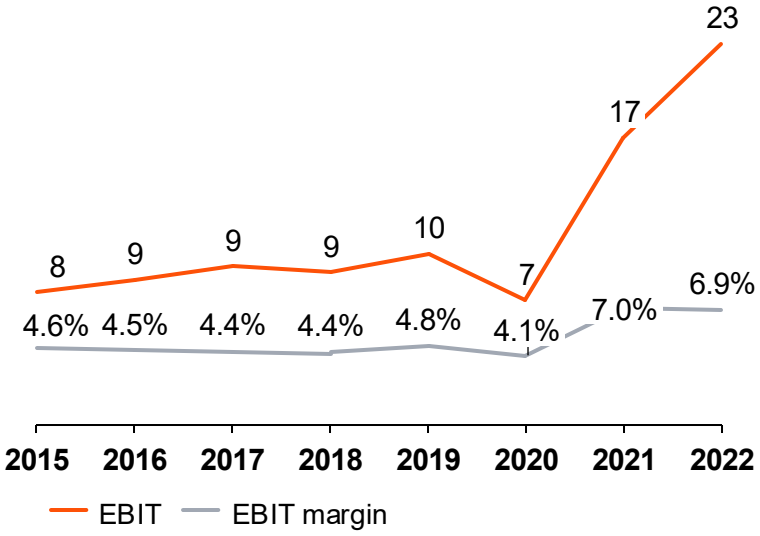
Assets, Turnover, EBIT, Net Income and Debt are expressed in € mn.

In the post-pandemic era, Greek firms showed a strong rebound

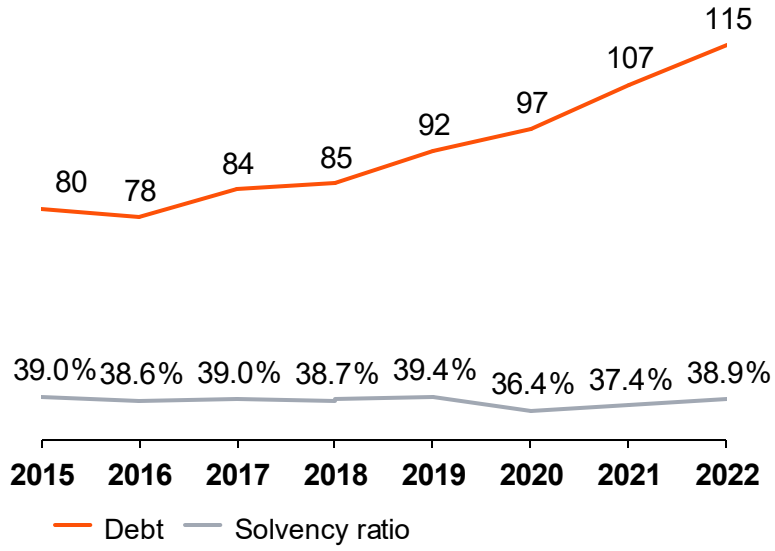
Turnover & Capital Employed (€ bn)



EBIT (€ bn) **& EBIT margin** (%)



Total Debt (€ bn) **& Solvency ratio** (%)



Between 2015 and 2022, **Greek firms marked significant business growth** as:

- Turnover increased by 107%
- Capital employed increased by 65%

During the last 2 years their **profitability was remarkable** with total EBIT margin being around 7%.

Their debt surpassed €100 bn, but they **stabilised their solvency** ratio, thus **improving their profitability**.

Source: Orbis, PwC analysis

Zombies are more fragile, compared to non-zombie firms

Following the application of the "zombie" criteria, we separate zombie and non-zombie firms.

Zombie companies show **weaker business activity and liquidity**.

In particular, a **typical (median) zombie company**:

- is **smaller** in terms of revenue
- **relies more on debt**
- shows greater **difficulty in meeting short-term obligations**
- tends to be **older** than a non-zombie one

Note: Overall similar insights with ICR-based measures of zombie classification (refer to Appendix).

Source: Orbis, PwC analysis

Variables	Non-zombie Median	Zombie Median
Assets	3.391	3.727
Turnover	2.698	0.817
EBIT	0.165	-0.130
Net income	0.084	-0.180
Profitability	6%	-15%
Short-term debt	0.053	0.102
Long-term debt	0.061	0.186
Leverage	13%	27%
Solvency	40%	25%
Liquidity	148%	113%
Age (years)	19	22

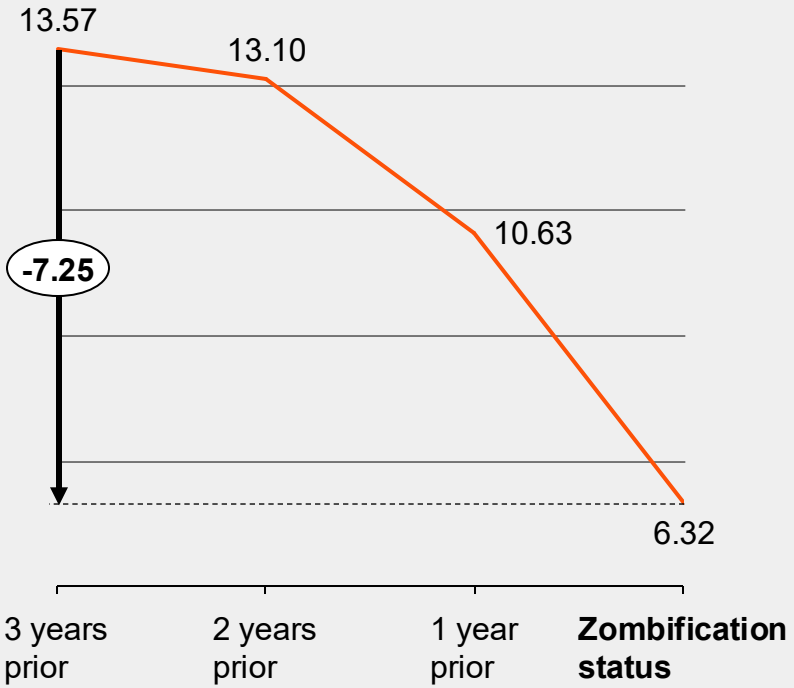
Assets, Turnover, EBIT, Net Income and Debt are expressed in € mn.

Prior to “zombification”, firm fundamentals worsen

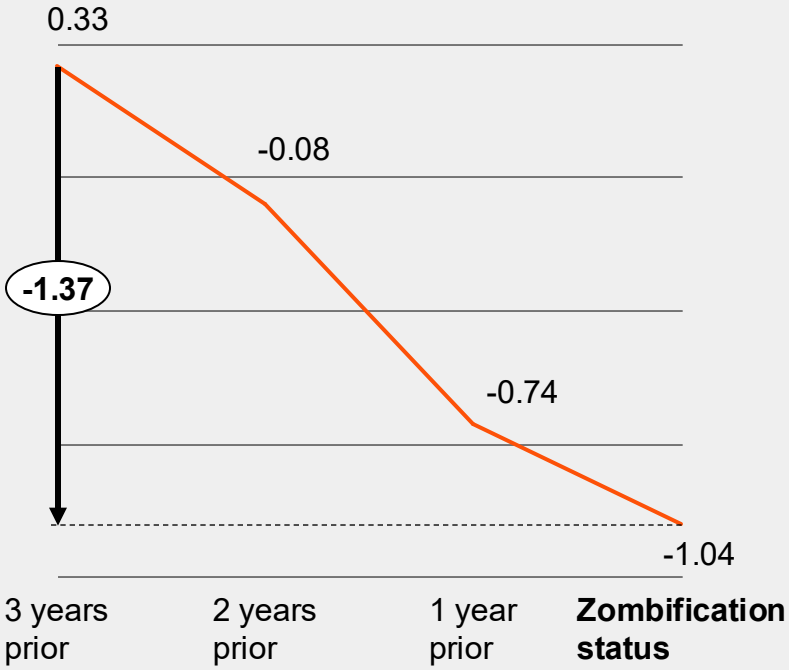
Firm performance deteriorates ahead of a firm being classified as zombie, with falling average turnover and EBIT across zombie firms.

Declining Turnover and EBIT can be perceived as a **signal for zombification** strengthening the need for prevention.

Turnover prior to zombification status
(€ mn)



EBIT prior to zombification status
(€ mn)



Note: Figures present the annual average turnover and EBIT of zombie firms (expressed in € mn) over the three years that precede the zombification (first time that the firm is classified as zombie using PwC methodology).

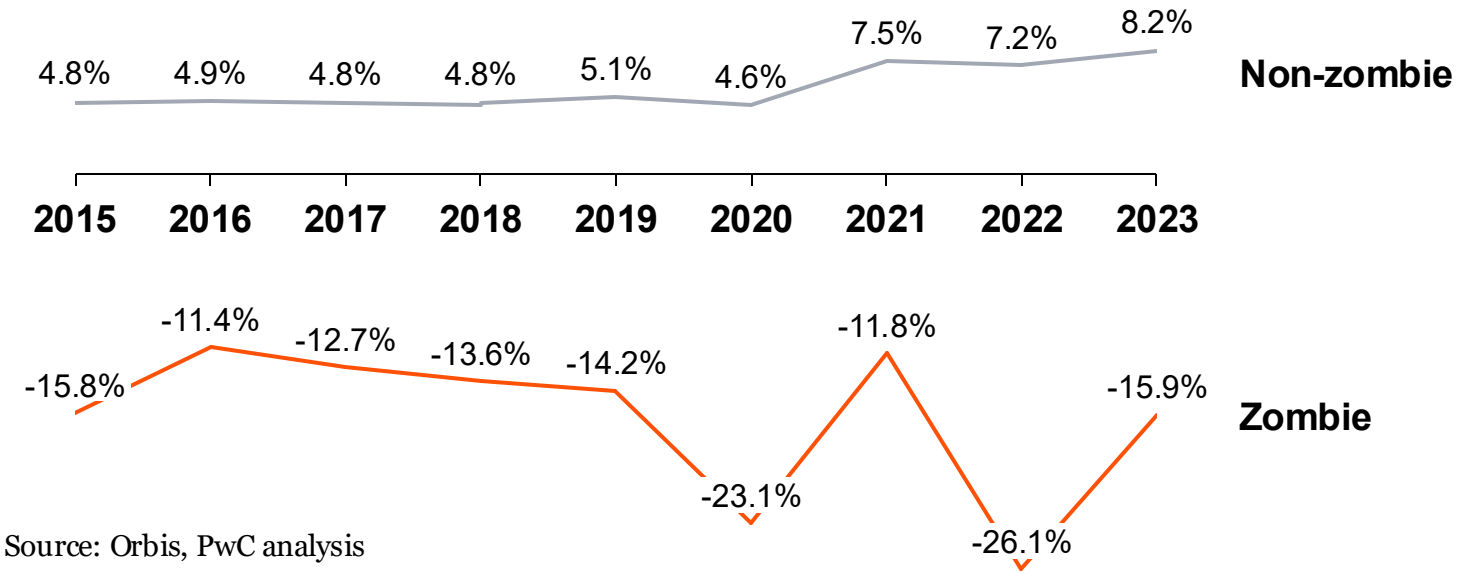
Source: Orbis, PwC analysis

In terms of profitability, the gap is large and persistent

The ever-widening gap

While healthy firms' profitability ratio is increasing through the years, zombie firms face significant challenges. Their profitability ratio is consistently negative and deteriorated significantly during the Covid-19 crisis.

Median profitability ratio of non-zombie and zombie firms
2015-2023



Source: Orbis, PwC analysis

26.1%
average gap for the period **2020-2023**

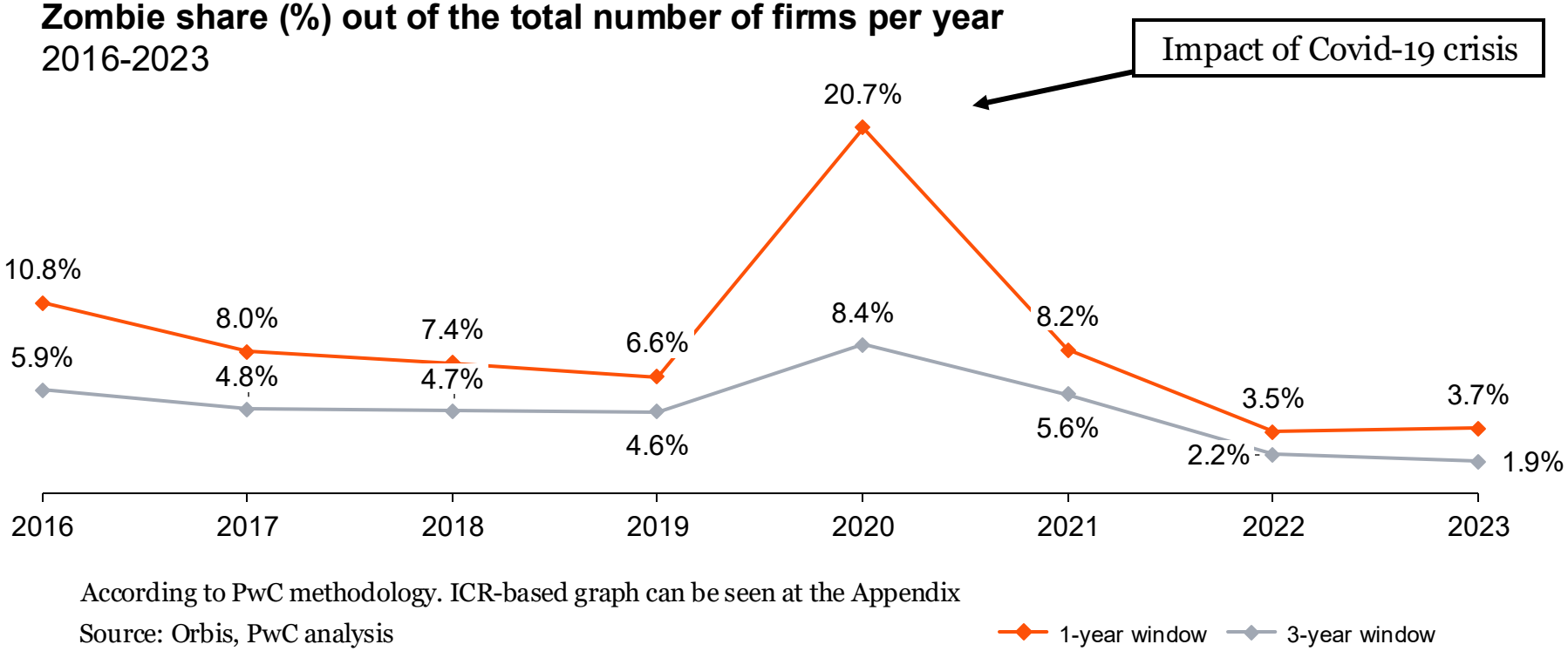
18.4%
average gap for the period **2015-2019**

5

The evolution of the share of zombie firms in Greece over time

Proportion of zombie firms has declined over time

Zombie share (%) out of the total number of firms per year
2016-2023



According to PwC methodology. ICR-based graph can be seen at the Appendix

Source: Orbis, PwC analysis

Around

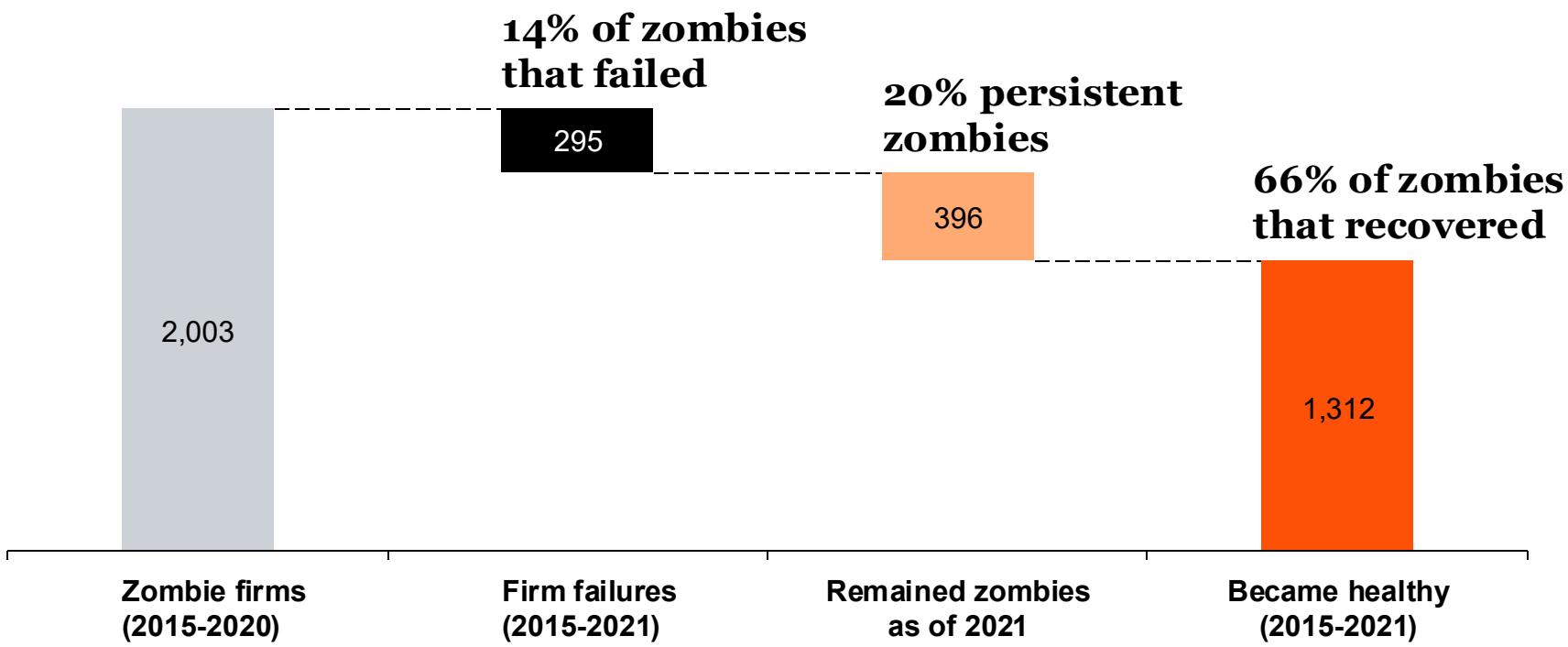
2-4%

the **proportion of zombie firms** has declined over time, reaching its lowest level in 2023.

- Using either the baseline zombie classification approach (based on conditions met over a 3-year window) or a less restrictive approach (using 1-year window), the **zombie share declines over time**. Higher overall zombie share with less strict criterion, e.g. 11% in 2016.
- The PwC methodology highlights the **impact of the Covid-19 crisis**, as evidenced by the strong increase in the zombie share between 2019 and 2020, which **could have been worse without the Greek government intervention** (Gourinchas et al., 2020; IMF, 2021).
- **ICR methodology shows a similar decline over time**. ICR-based zombie share reached its lowest level in 2023 (see Appendix).

Two-thirds of zombie firms recovered within 2015 and 2021

Evolution of zombie firms (2015-2021)
New zombie firms per year (first classification)



Source: Orbis, PwC analysis

- Between 2015 and 2020, a total of **2,003 firms** were classified as **zombies**.
- By 2021, around **two-thirds (66%) of zombie firms had recovered**, showing that a significant share of Greek firms managed to return to financial health in the aftermath of the sovereign debt crisis and the pandemic.
- **One in five (20%) remained trapped in zombie status**, unable to recover or return to financial health. These businesses hinder the release of capital into the market, which could otherwise be utilised by healthier companies.
- At the same time, **14% of zombie firms failed** and exited the market.

6

The share of zombie firms by firm size and across sectors

How sector and size differentiate the “zombie” status?

We aim to identify whether a firm’s turnover/size exposes it to “zombification”. In addition, it is essential for our analysis to investigate the role of economic activity to a company’s “healthy” status.

Firm size

For our analysis we used the **European Commission’s classification** of firms by size based on their annual turnover.

In particular, the firms are classified as follows:

- **Micro** firms**: < €2 mn (40% of sample)**
- **SMEs: €2-50 mn (55%)**
- **Large** firms**: > €50 mn (5%)**

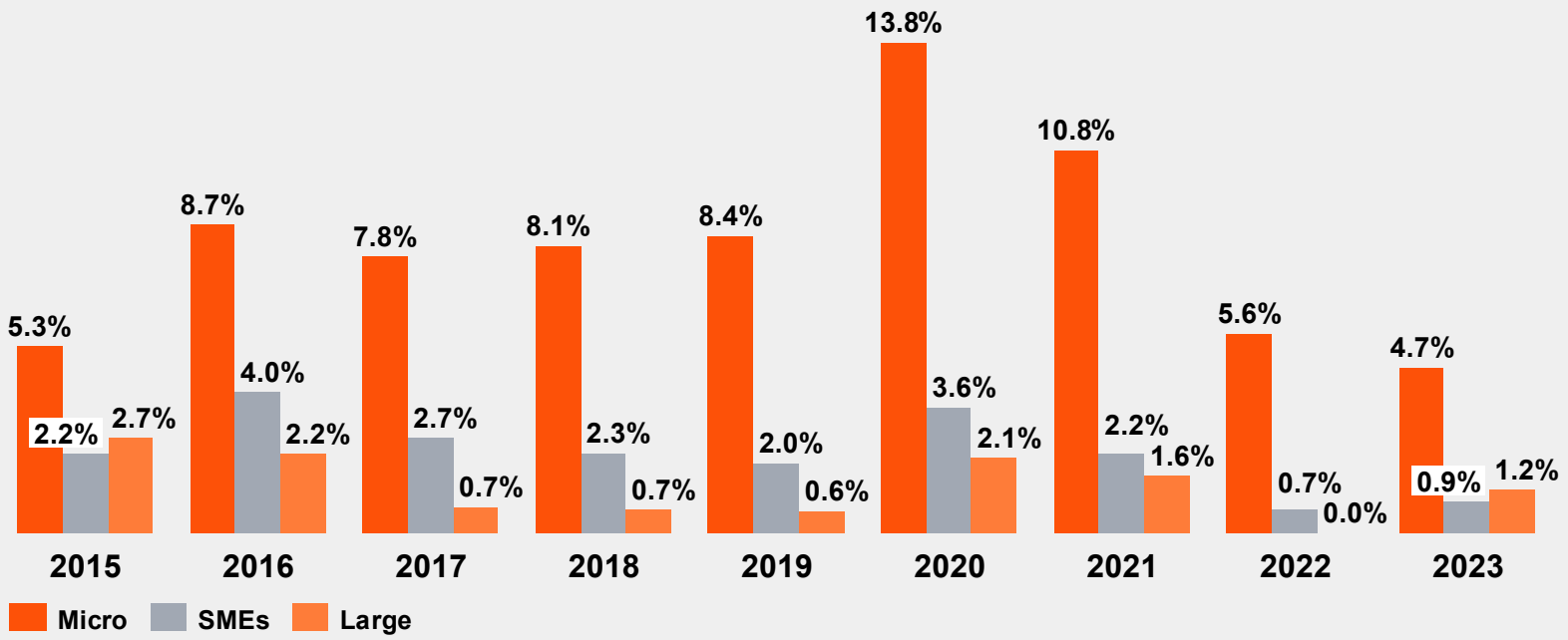
Sectors

The sampled Greek companies are **classified in seven sectors** according to the type of economic activity (based on the **PwC classification**):

1. **Industry**: Comprised of companies that are part of heavy and light industry, food and beverage production, pharmaceutical companies, and energy companies (petroleum refining and renewable energy sources).
2. **Commerce:** Comprised of companies active in retail and wholesale commerce, fuel retail, and food and beverage commerce.
3. **Services:** Consist of enterprises that are active in providing services to other companies, as well as entertainment, IT and transportation companies.
4. **Investment companies:** Comprised of companies specialising in leasing and real estate-related services.
5. **Tourism:** Including hotel companies, travel agencies, car rental companies and cruise enterprises.
6. **Infrastructure:** Consists of telecommunication service providers and utility companies.
7. **Construction:** Comprised of companies engaging in building-related activities.

Micro firms are the ones who are the most vulnerable, especially in times of crisis

Share of zombie firms by firm size
2015-2023



Source: Orbis, PwC analysis

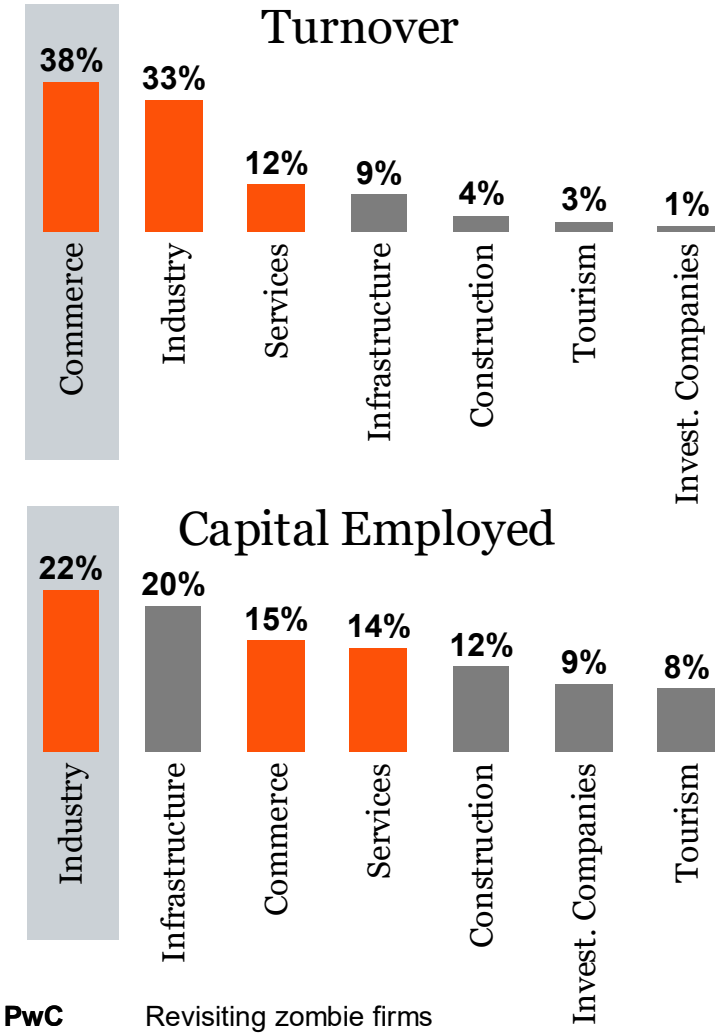
- The **share of micro zombies** exhibits significant volatility, **sharply increasing during 2020**, but **then rapidly declining** following the pandemic.
- **Micro firms** are **more sensitive** to economic conditions.
- **SMEs and large** companies have a small zombie share in the economy overtime.
- By **2023**, **zombie shares** across all size groups reach their **lowest levels.**

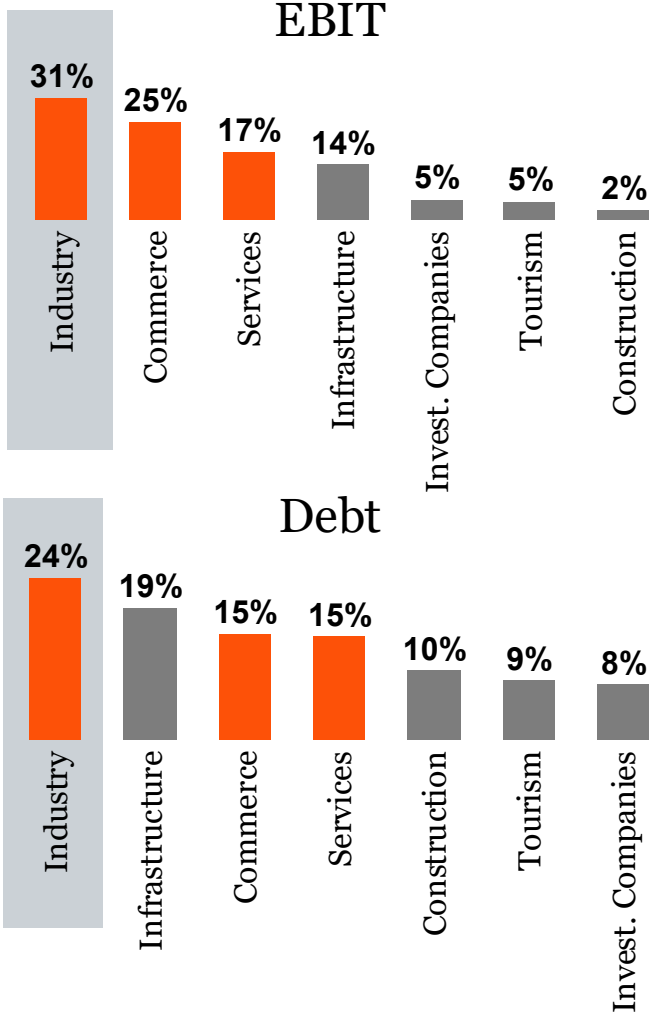
Average zombie share (2015-2023)

8.1%	2.3%	1.3%
Micro firms	**SMEs**	**Large** firms

Industry, Commerce and Services are the top sectors in terms of financial performance

Sectors' share in the total value (cumulative value across 2015-2023)





Industry, Commerce and Services represent:

83% of total **Turnover**

73% of total **EBIT**

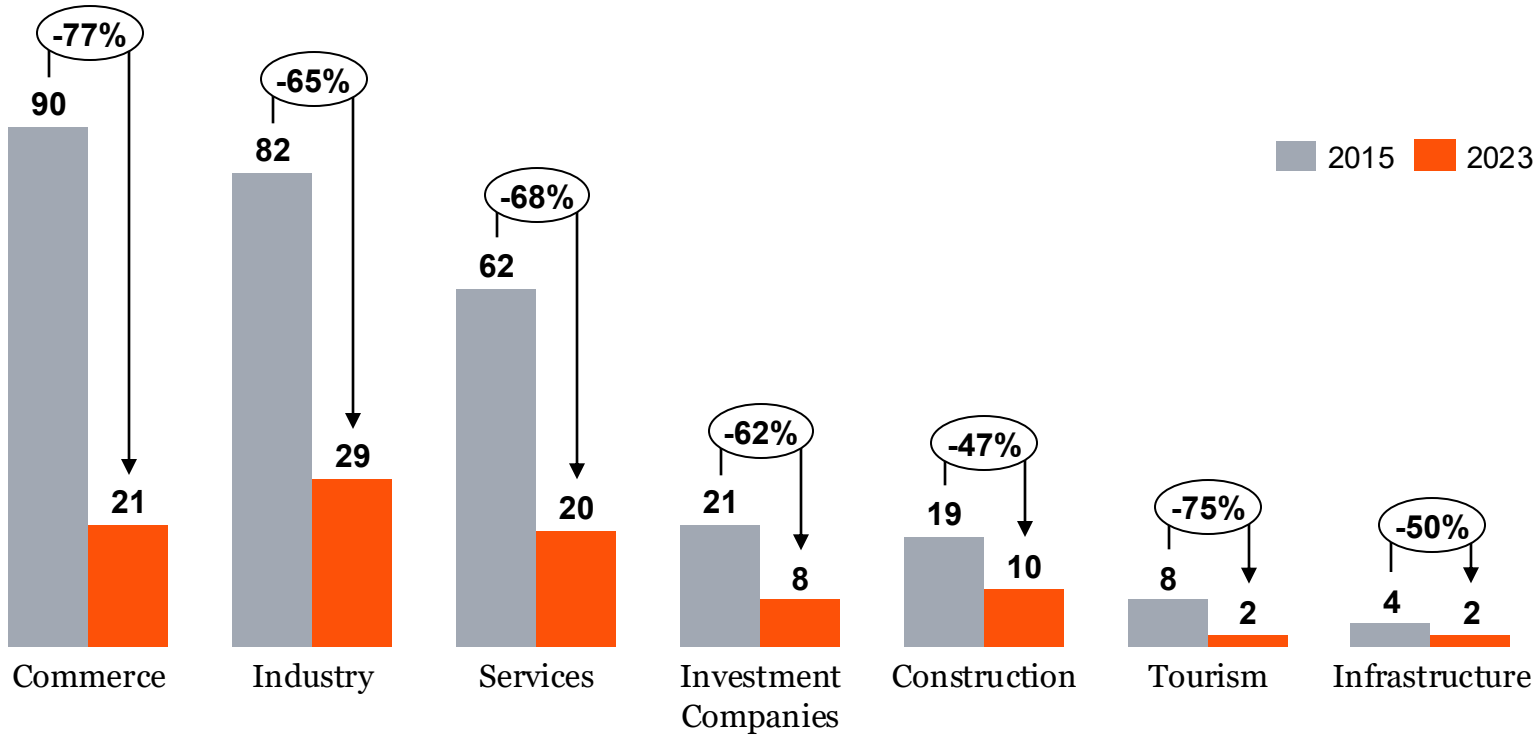
51% of total **Capital Employed**

54% of total **Debt**

Source: Orbis, PwC analysis

Commerce and Tourism recorded the steepest reduction in zombie firms

Total number of Zombie firms* per sector
2015 vs 2023



*Total number of firms classified as zombies each year
Source: Orbis, PwC analysis

- Almost all sectors have **reduced** the zombie firms in absolute number **by more than 50%,** reflecting **a broad trend of recovery** and improved business sustainability across all sectors.
- **Commerce (-77%) and Tourism (-75%)** recorded the **steepest reductions** in zombie firms, while **Industry** and **Services** also recorded significant declines.
- **Tourism** and **Infrastructure** have small number of zombies over time.

7

The relationship between zombie firms and firm failure

Methodology

Aiming to understand **why some Greek companies survive while others fail**, focusing on the **impact of Zombie firms on fail rate**, we employ an econometric survival model to analyze the drivers of firm failure and make reliable conclusions.

Fail rate: The ratio of **failed firms to the total number of firms** in the given year.

Identifying

Identifying firm failure, we include:

- Firms that apply to the failure status based on Orbis: Active (insolvency proceedings); Bankruptcy; Dissolved; Dissolved (liquidation); In liquidation; Inactive (no precision)
- Firms that appear as "Active" but produced last financial statement until 2021 (based on "Last Available Year" in Orbis)

We **assume** that **firms fail in the last year they published financial statements**

We **exclude 2022 & 2023** since the **reliability of failure classification declines**

Modelling

The determinants of firm failure we choose using the proportional hazard model (Cox, 1972):

$$h(t, X_i) = h_0(t)\exp(\beta X_i + \gamma Z_i)$$

- h is conditional hazard rate: probability of failure conditional on surviving up to year t and on the covariates; $h_0(t)$ is baseline hazard rate

Covariates include:

- Total assets (log), Leverage, Profitability, Liquidity, Age (log)
- A dummy variable reflecting firm's zombie status (Zi = 1 if zombie and 0 otherwise)

Year and Sector are **included** as **fixed effects**

The smaller the firm, the higher the fail rate

Fail rate in micro firms triple relative to large firms

Over the period 2015-2021, the **average fail rate among all companies is 2.44%**, while the average fail rate **in zombie firms** is highest hovering at **3.97%**

Average fail rate ranges from:

Average fail rate is **3.26%** in **micro firms**

Average fail rate is **1.8%** in **SMEs firms**

Average fail rate is **0.91%** in **large firms**

Government support packages blunted the impact of the pandemic

The **effect of the pandemic of average firm fail rate** would have been **significantly stronger in the absence of the Government interventions** (Gourinchas et al., 2020).

Zombies face more than double risk of failure and smaller, newer and high leveraged firms are more likely to fail

- **Larger firms** face a **lower likelihood of failure**
- **Higher leverage** increases failure risk
- **More profitable firms** have a **lower** probability of failure
- **Older firms** exhibit **lower failure rates**

Zombies have 2.7 **times** higher risk of failure

Survival analysis
2015-2021

	each of the five covariates					all five covariates	PwC-based zombie status	all continuous variables at the 1st and 99th percentiles
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(Assets)	-0.162***					-0.154***	-0.153***	-0.199***
Leverage		0.188***				0.194***	0.179***	0.688***
Profitability			-0.000*			-0.000**	-0.000*	-0.176***
Liquidity				0.000**		-0.000	-0.000	-0.001
Ln(Age)					-0.172***	-0.087***	-0.128***	-0.117***
Zombie (PwC)							0.975***	0.815***
Sector Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of observations	98,990	98,990	96,814	98,970	97,694	95,527	75,419	75,419

Note: Table presents estimates from Cox proportional hazard model for Greek firms over the period 2015-2021. The dependent variable is the hazard of firm failure. A positive coefficient indicates that the risk of firm failing is increasing in that variable. To address the influence of extreme values, column 8 uses winsorized data at the 1st and 99th percentiles. N represents the number of firm-year observations. z-statistics (in parentheses) are based on standard errors clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

Source: Orbis, PwC analysis

Areas for improvement

Areas for improvement

Although zombie share has declined significantly, challenges remain. The following areas highlight where firms and the economy need to improve to strengthen resilience and long-term sustainability.

Enhance restructuring and consolidation incentives

Firms need to adopt **more proactive restructuring and market-driven mindset**, which involve changing the company's structure or strategy in response to market conditions, customer needs, or competitiveness pressures.

- Cultivate a **culture of cooperation within the business ecosystem** by creating **synergies** that enable **micro businesses and SMEs** to access resources and expertise, helping them remain competitive.
- Encourage and support **consolidation during periods of financial strength** to avoid prolonged stagnation.

Accelerate business transformation and innovation

Many viable but struggling firms **continue to delay adopting sustainable business models**, while progress in innovation and digitalisation, remains limited.

- Offer **targeted investment incentives** for digitalisation and R&D, and promote the adoption of AI tools to improve operational efficiency and competitiveness.
- Support firms pivot toward higher-value activities through **operational restructuring**.

Monitor insolvency process efficiency

Current insolvency framework is often underutilised. More effective mechanisms are needed to ensure that non-viable firms exit the market smoothly or consolidate with minimal disruption. The **process must ensure fairness** by protecting creditors, employees and viable firms.

- **Streamline judicial decisions** and accelerate insolvency procedures to facilitate smooth market exit for non-viable firms.
- **Introduce incentives** such as tax deductions or favorable business loans for entities undergoing restructuring or liquidation.
- Develop a **private debt monitoring mechanism** to track micro-enterprises' debt exposure proactively and mitigate insolvency risks.

Targeted micro financing solutions

Smaller firms remain disproportionately **exposed to zombie risk**. They generally face higher failure rates and demonstrate weaker survival capacity, while access to finance for micro enterprises remains constrained.

- Establish an **effective mechanism** to **evaluate the performance of micro firms** in order to better assess the risks in funding solutions.
- Develop **a tailored framework** to support and coordinate all **the financing tools** for micro firms and SMEs.

Thank you

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