

# Are you a Zombie? A Supervised Learning Method to Classify Unviable Firms and Identify the Determinants<sup>\*</sup>

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Full Paper

## Abstract

We examine the determinants of zombie companies using a comprehensive firm-level dataset of public corporations from Europe and the United States. We show that US zombie companies differ from their European peers on a number of firm-specific and industry-specific factors. Using decision trees, we document that income and leverage-related variables are among the main drivers classifying zombie companies in Europe, while dividends and stock-related variables are the most important in the US. We observe a frequent mislabeling of zombie firms into other unviable types of firms. To account for this, we also examine the determinants of distressed firms and compare them to the zombie. We find that zombie and distressed are not comparable types of companies, rather companies at a different stage of their financial unviability. We also document that zombification is especially a European phenomenon, while distressed-type of firms are mostly populating the US economy. We find no major differences in terms of zombie company-specific determinants between crisis and non-crisis periods.

**JEL codes:** C55, C63, D22, E44, G32, G33

**Keywords:** zombie firms, financial constraint, decision trees, distressed firms

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