# A model to assess the financial vulnerability of Italian firms[☆]

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## Abstract

We develop a model to assess the financial vulnerability of the Italian corporate sector over a two-year horizon under baseline and stressed scenarios. To take into account the heterogeneity of firms and their demography we use micro data, which are then integrated with macroeconomic forecasts. We find that an accommodative monetary policy combined with economic recovery and pro-growth reforms widely reduce the vulnerability of the corporate sector. However, micro firms and those operating in the construction sector remain the most vulnerable, suggesting that targeted policies would be beneficial.
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## 1. Introduction

Critical financial conditions of the non-financial corporate sector are a key source of systemic risks (e.g. IMF, 2013a). Assessing the financial status of companies is particularly relevant for countries like Italy, where firms' liabilities represent a large share of banks' assets and thus need

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to be closely monitored for financial stability purposes. In this paper we develop a model to evaluate how financial vulnerability in the corporate sector evolves over time. To capture firms' heterogeneity, which is quite crucial for policy recommendations, starting from individual data is fundamental. However, as individual balance sheet data provided by Cerved[1] are available with a delay of about 15 months, we complement them with more timely macroeconomic forecasts and we estimate the evolution of profitability, interest rates and debt at the firm level. Starting from the 2013 data, we provide projections of the share of vulnerable firms, those whose interest expense-(IE)-to-EBITDA ratio is above 50% or whose EBITDA is negative, and of their debt over a two-year horizon under baseline conditions and scenarios of stress.

Our indicator of vulnerability matters for policy evaluations and recommendations as it relates both with firm defaults and with national economic and financial conditions. First, over the period 2005–2013, we find a positive correlation of 0.7 between the share of debt held by vulnerable firms in year $t$ and the share of firms' debt going into default in $t+1$, while the contemporaneous correlation is close to zero. Thus, the share of vulnerable firms is a leading indicator of default in the corporate sector. As shown in Fig. 1a, the default rate for the corporate sector increased after a prolonged period of slow or negative economic growth; that increase was anticipated by a symmetric change in the share of vulnerable firms.

Second, our indicator can be easily linked to the evolution of economic (profitability) and financial (interest rate and debt) variables in a country (Fig. 1b). The share of vulnerable firms was fairly constant between 2004 and 2007, a period characterized by positive growth in EBITDA, which more than offset the growth in interest expense. The latter was mostly due to the sustained growth in the corporate sector's financial debt, which contributed to the increase in firms' vulnerability up to 2008, while it played a smaller role thereafter. The share of vulnerable firms peaked at 36.2% in 2008, as the result of the combination of a decrease in profitability and a rise in interest expense. Between 2008 and 2010 the vulnerability indicator decreased following the sharp reduction in the cost of debt in 2009 and the recovery of profitability in 2010. The recession and the increase in the cost of debt following the sovereign debt crisis in 2011 explain the subsequent increase in the share of vulnerable firms up to a new peak in 2012 of 34.0%. The situation slightly improved in 2013 as the cost of debt fell due to the effects of monetary policy. The dynamics of the debt held by vulnerable firms is similar since it increased by 9 percentage points between 2006 and 2008, when it peaked at 50%.

These evidences suggest that changes in the monetary policy and in the economic conditions influence the vulnerability of the corporate sector which in turn anticipates the default rates. Thus, our model, which projects the share of vulnerable firms and their debt, can provide three main kinds of policy recommendations. First, it can be used for macroprudential purposes to identify which firms are more vulnerable in the baseline scenario and under scenarios of stress (Bank of Italy, 2015a). Second, it highlights the potential need of supporting measures to reduce the impact of a crisis or to promote economic growth (e.g. Annicchiarico, Di Dio, & Felici, 2013; Feldstein, 2014). Furthermore, those supporting measures can be directly targeted to riskier firms, exploiting the information on the existing heterogeneity in the corporate sector. Among these measures, we could list interventions that favour the exports (which mostly help the manufacturing sector) or incentives to renovate houses (which directly affects the construction sector). Third, our model

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[1] See Section 2.2 for a description of the data. The firms included in the Cerved database are similar to those included in Orbis, a source commonly used for international comparisons. However, Cerved provides much more detailed information. For our analysis, the most relevant difference is the precise identification of financial debt, which is not possible using the Orbis database.