



# Financial distress of Chinese firms: Microeconomic, macroeconomic and institutional influences<sup>☆</sup>



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## ABSTRACT

We study the impact of both microeconomic factors and the macroeconomy on the financial distress of Chinese listed companies over a period of massive economic transition, 1995 to 2006. Based on an economic model of financial distress under the institutional setting of state protection against exit, and using our own firm-level measure of distress, we find important impacts of firm characteristics, macroeconomic instability and institutional factors on the hazard rate of financial distress. The results are robust to unobserved heterogeneity at the firm level, as well as those shared by firms in similar macroeconomic founding conditions. Comparison with related studies for China and other economies highlights important policy implications.

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## 1. Introduction

In this paper, we investigate the impact of microeconomic factors and macroeconomic conditions, as well as institutional influences, on financial distress of Chinese listed firms. Using hazard regression analysis, we find substantial effect of firm level covariates (age, size, cash flow and gearing) on financial distress, and also a significant role for macroeconomic stability. Further, there are important institutional effects. We find that the hazard rate of financial distress varies with the stock exchange where the firm is listed, but the effect of state ownership is not statistically significant. There is, however, an indirect effect of ownership, since choice of stock exchange for Chinese listed firms is closely related to state ownership. The results are robust to alternative measurements of distress and to unobserved heterogeneity, both at the firm level as well as those shared by firms in similar macroeconomic founding conditions. Comparison of our results with related studies for both China and western economies highlights several important policy implications.

Chan and Chen (1991) defined financially distressed firms as those that “*have lost market value because of poor performance, they are inefficient producers, and they are likely to have high financial leverage and cash flow problems. They are marginal in the sense that their*

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prices tend to be more sensitive to changes in the economy, and they are less likely to survive adverse economic conditions." Therefore, investors demand a premium for holding such risky stocks and expect to be rewarded for bearing the risk.

Typically, financial distress of the above nature is measured by the probability of failure (Altman, 1993; Shumway, 2001). However, despite being financially distressed many firms do not exit. In the US, such firms often file for bankruptcy under Chapter 7 or Chapter 11, or de-list for performance related reasons, without necessarily going out of business (Campbell, Hilscher, & Szilagyi, 2008). One of the reasons is the protectionist stance of bankruptcy codes (Bhattacharjee, Higson, Holly, & Kattuman, 2009a). Likewise, business exits in our data on the Chinese quoted firms are vanishingly rare, arguably because of active state protection for the failing firm.

The divergence between exits and financial distress is also related to the distinction between fixed and sunk costs. Whilst both sunk costs and fixed costs are independent of firm output, they have different implications for firm exits (Owen & Ulph, 2002). Fixed costs relate to assets that are valuable to other firms, and therefore in the event of exit can be traded in the secondary market. By contrast, sunk costs involve assets that are valuable solely to the firm that creates them and unlike fixed costs, entail exit costs. Thus, an incumbent firm exits only if its operating profits cover the fixed costs, but not necessarily its sunk costs plus fixed costs; in the latter case, the firm is financially distressed but does not exit. The distinction between financial distress and exit is particularly large when the secondary market for used capital is not fully developed and hence sunk costs are high.

Measurement of financial distress must recognise the above distinction with exit (or failure). In this paper, we construct our own indicator for financial distress at the firm level. This indicator measures the degree to which operating profits cover the financial costs of the firm, the total of debt obligations relating to firm-specific assets (sunk costs) and other capital assets (fixed costs), controlling for the possibility that some firms may undergo rapid expansion by accumulating debt. Against the institutional setting of active state protection, we develop an economic model of financial distress, where firms receive protection in the form of a guaranteed threshold return on their capital. Finally, we use our measure to study macroeconomic, microeconomic and institutional influences on firm turnover.

This paper makes several important contributions. First, we develop a model of state protection in an economy with high sunk costs and limited secondary market for acquired capital. Testable implications are verified using duration data on financial distress. Second, given the importance of the Chinese economy, understanding failure in the Chinese industry is important for investors. Third, whilst the macroeconomy is a potentially important determinant of financial distress, the effect of macroeconomic conditions and instability on financial distress and exit has not been adequately studied in an emerging market context. Thus, our research is useful for credit risk measurement and management for China, and for emerging economies more generally. Fourth, our research quantifies the effect of institutional factors, which are expected to be important against the backdrop of massive economic transition experienced in China. Last but not the least, the current study provides a basis for comparison with related research for advanced economies. In particular, our comparative analysis provides valuable insights into regulatory reform and development of institutions in a transition economy context.

The paper is organised as follows. Section 2 reviews the literature on financial distress and exits, followed in Section 3 by a discussion of the institutional background and the previous studies on Chinese firms. The data and variable construction are described in Section 4. Section 5 develops our economic model of financial distress and the empirical framework for our analysis. We discuss the estimated hazard regression models in Section 6, including comparison with the related studies both for the Chinese firms and advanced economies and implications for policy. Finally, Section 7 concludes.

## 2. Literature on financial distress and exits

There is a substantial literature on firm exits and distress in advanced economies where secondary markets for used fixed capital are well developed, so that the distinction between exits and financial distress is not critical. Whilst this paper focuses on financial distress in an emerging economy context, we review findings in existing western studies to bring forward implications for our work and to place the work within the existing literature.

### 2.1. Firm-level factors and industry

There is a large theoretical and empirical microeconomic literature pointing to the importance of firm- and industry-specific factors on financial distress, defaults and exits; see Siegfried and Evans (1994) and Caves (1998) for reviews. The current theories of industrial organisation predict that exit rates may decline with firm age and size; see, for example, Caves (1998), Pakes and Ericson (1998) and Jovanovic and Rousseau (2002). Consistent with the above theoretical models of firm-level learning, the credit scoring literature has highlighted financial ratios including leverage, cash flow, and profitability, in addition to firm age, size and industry, as determinants of exits or failure, with binary response models providing the basis for probability scores of company failure (Lennox, 1999; Taffler, 1982). Similarly, the current theories and empirics of industrial organisation highlight the importance of industry conditions (Bhattacharjee, Higson, Holly, & Kattuman, 2009b; Caves, 1998).

### 2.2. Macroeconomic conditions and instability

At the same time as microeconomic factors are important, firm defaults increase dramatically during economic downturns (Carty & Fons, 1993; Fama, 1986; Koopman & Lucas, 2005). More generally, macroeconomic conditions have good explanatory power for corporate defaults and are useful in modelling credit risk; see, for example, Nickell, Perraudin, and Varotto (2000), Bangia, Diebold,

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