Bankruptcy, international style: What financial factors predict corporate bankruptcy globally

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The only uniform corporate indicator predicting a firm's bankruptcy in three of the world's major economies is a company's sales turnover.

Other predictive indicators of corporate bankruptcy vary by country and market system, according to University of Cincinnati research to be released on Aug. 4 regarding 23 financial variables associated with corporate bankruptcy from 1995 to 2009. For instance, only in the United States does it appear that a company's size is a risk factor for bankruptcy. In the U.S., the smaller a company, the greater the apparent risk for bankruptcy.

The research project, Forecasting Corporate Bankruptcy: International Evidence, was conducted by UC's Yan Yu, associate professor of [quantitative analysis](#) and operations management, and Shaonan Tian, UC doctoral student in quantitative analysis.

Yu and Tian will present their findings and the predictive corporate bankruptcy model they have developed at the Joint Statistical Meeting (JSM), the largest gathering of statisticians in North America, to be held in Vancouver July 31-Aug. 5, 2010.

The JSM is held jointly by the American Statistical Association, the International Biometric Society, the Institute of Mathematical Statistics, the Statistical Society of Canada, the International Chinese Statistical

Association and the International Indian Statistical Association.

BASIC BACKGROUND AND GROWING BANKRUPTCY NUMBERS

Yu and Tian, both from UC's College of Business, examined international bankruptcy records dating from 1995 to 2009 in order to determine which corporate financial variables are likely to lead to bankruptcy of a firm in the U.S., the United Kingdom and Japan. They studied both companies that went bankrupt and those that did not: More than 4,500 publicly traded companies in Japan, of which 100 went bankrupt; more than 3,500 companies in the U.K., of which 65 went bankrupt; and more than 18,000 firms in the U.S., of which almost 500 went bankrupt.

It's research taking on a new level of importance given that corporate bankruptcies are on the rise in the U.S., climbing by 40 percent between 2008 and 2009 alone.

"This is information and a model valuable to regulators, lenders, investors, corporate leaders and the economy as a whole. Corporate bankruptcies are now occurring at higher rates than at any time since the 1930s. There is a corresponding rise in the economic costs of bankruptcies. In 2002, corporate bankruptcies in the U.S. represented an estimated loss of $100 billion to the economy. Now, economic losses due to corporate bankruptcy defaults have increased to trillions of dollars," explained Yu.

In testing 23 financial variables within the bankruptcy records, Yu's data-mining model exhibited a 97 percent correlation rate with a subsequent bankruptcy in one year's time. It exhibited accuracy of more than 80 percent in correlating with a firm's bankruptcy in two- or three-year's

time. The 23 variables studied included the five classic financial ratios from Altman's Z-score, including the important profitability indicator of Sales/Total Assets (sales turnover).

She said, "The study confirms that in different countries, different financial factors are correlated with bankruptcy, mainly due to varying financial and business structures. For example, leverage activities (techniques to multiply gains and losses) seem to be more important to forecasting bankruptcy in Japan, while liquidity (the ability of a company to quickly turn assets into cash) is essential to predict bankruptcy in the U.K."

CORPORATE BANKRUPTCY INDICATORS THAT ARE COUNTRY SPECIFIC

THE U.S. AND THE U.K.

Liquidity is a crucial measure of a company's ability to quickly sell non-cash assets in order to obtain cash. And unhealthy ratios related to liquidity seem to be the strongest predictors of a coming bankruptcy for firms in the U.S. and the U.K.

Other indicators are specific to individual country or shared with only one other country in the study.

UNITED STATES

- In the U.S. alone, company size (total assets) seems to be a risk factor for bankruptcy. The smaller the company, the greater the apparent risk for bankruptcy. (But Yu cautioned, "This may very well change as the economic recession continues, and we

integrate macro economic effects into our research model.")

- Growth of Inventories/Inventories (inventory turnover ratio)

- Market Equity (Yearly)/Debt (annual dollar value of a company's stock in relation to its short- and long-term debt)

UNITED KINGDOM

- Cash/Total Assets (Cash on hand in relation to total assets.)

- Quick Assets/Current Liabilities (Assets like accounts receivable or marketable securities which can be quickly collected or sold for cash as a ratio of current liabilities, i.e. , current debt payments.)

- Working Capital/Total Assets (Measures liquid assets in relation to the size of the company.)

- Current Liabilities/Total Liabilities (Debts or obligations due within one year as a ratio of all debt and obligations, both short- and long-term.)

- Market Equity (Yearly)/Debt

JAPAN

The most important financial ratio for predicting corporate bankruptcy in Japan is related to leverage, the ability to multiply gains and losses via borrowing, use of derivatives or other means.

Said Yu, "Because the U.S. and U.K. operate under the free-market

system, high liquidity is desired to prevent a firm's bankruptcy. In contrast, it's likely that Japan's 'main-bank system' may release companies from the liquidity demands common in a free market. It's a system where every corporate company is associated with a limited number of major commercial banks. Since each firm is closely related to at least one major commercial bank, it's very unlikely that firms go bankrupt due to liquidity variables. So, leverage variables then become a firm's key risk factor in Japan."

Other variables, if unhealthy, predict bankruptcy in Japan. One of these (Working Capital/Total Assets) is shared with the U.K.

- Operating Income/Total Assets (Operating income is the difference between operating revenue and operating expenses and depreciation.)

- Retained Earnings/Total Assets (Retained earnings are profits not distributed as dividends.)

- Inventories/Sales (The investment in inventory in relation to the monthly sales amount.)

- Current Liabilities/Total Assets

- Working Capital/Total Assets

Provided by University of Cincinnati