Journal of Financial Stability 18 (2015) 172–186

Contents lists available at ScienceDirect

Journal of Financial Stability

journal homepage: www.elsevier.com/locate/jfstabil

Creditor recovery: The macroeconomic dependence of industry equilibrium☆

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ARTICLE INFO

Article history:
Received 31 July 2014
Received in revised form 20 January 2015
Accepted 8 April 2015
Available online 17 April 2015

JEL classification:
G33
G32
G12
E32

Keywords:
Recovery rate
Loss given default
Credit risk
Business cycle
Fire-sales

ABSTRACT

This paper reconciles the state of the economy with industry conditions in driving asset liquidation values and, therefore, recovery rates on defaulted debt securities. Evidence to date downplays the economywide effect in favor of industry and debt characteristic explanations. This paper shows that macroeconomic effects are important but operate differentially at the industry level. Industries whose sales growth is more correlated with GDP growth recover less during recessions. And industries that are more dependent on external finance recover less when the stock market falls. These findings expose how economywide shocks are transmitted to industry downturns, providing a framework for the role of aggregate risk in recovery risk and for macroeconomic stress testing.

1. Introduction

In the aftermath of the recent financial crisis, both practitioners and academics have paid increasing attention to creditor recovery rates (or its opposite, loss given default). This paper investigates whether creditor recoveries depend on the macroeconomy in an economically important manner. This research reconciles two different strands of the literature on corporate recovery rates. One strand explicitly models the dependence of recovery rates on the business cycle. A primary example is the Federal Reserve's annual stress testing of large financial institutions, whereby the likelihood of a large loss is explicitly conditioned on adverse macroeconomic outcomes.[1] The other strand, mainly academic-focused research, increasingly downplays economywide effects. These studies—discussed at greater length in what follows—find that business-cycle conditions do not matter once one accounts for specific industry, bond market, and control-rights explanations.

This paper's contribution generally is to bridge these two strands of the literature by tying industry downturns with the state of the economy. The academic literature does not allow for the possibility that the extent of industries' sensitivity to the business cycle varies, whether for fundamental or liquidity reasons. This paper questions whether industry shocks are exogenous, as assumed, and considers instead whether economywide shocks induce industry downturns and possible industry fire sales. The paper's main contribution is in showing that different industries have different exposures to the business cycle and the stock market, and therefore, industry controls can mask such aggregate effects. This study, therefore,

☆ The views expressed in this article are solely those of the author. They do not necessarily reflect the views of the Federal Reserve Bank of Richmond or the Federal Reserve System. I thank an anonymous referee, Viral Acharya, Jose Berrospide, Mark Carey (discussant), Michael Gordy, Pei Shao (discussant), seminar participants at the International Finance Division of the Federal Reserve Board of Governors, the 2014 Global Finance Conference, the 2014 Interagency Risk Quantification Forum, the 2015 Midwest Finance Association Meeting, and former colleagues at the Kansas City Fed and the Bank of England for helpful comments on this research. I also thank Rick Babson for his copyediting assistance. In the interest of space, Appendix tables A1–A5 are in the working paper available at http://ssrn.com/abstract=2307657. Any remaining errors are my own.

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[1] For example, a typical loss on a loan portfolio is projected by multiplying the exposure at default by the probability of default and by the loss given default, where different models are developed for these loss components (Appendix B in Board of Governors of the Federal Reserve System, 2012).

http://dx.doi.org/10.1016/j.jfs.2015.04.004
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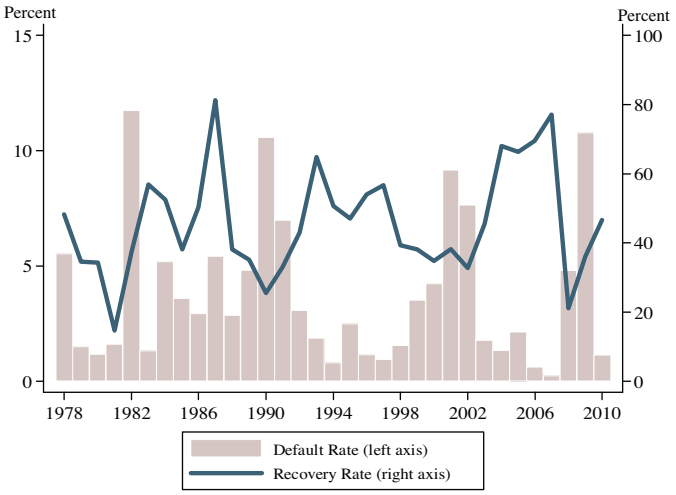

Fig. 1. The default rate and the recovery rate on defaulted securities.
Source: Author's calculations based on Moody's DRS 1970–2008 and Altman and Kuehne (2011) for 2009–10.

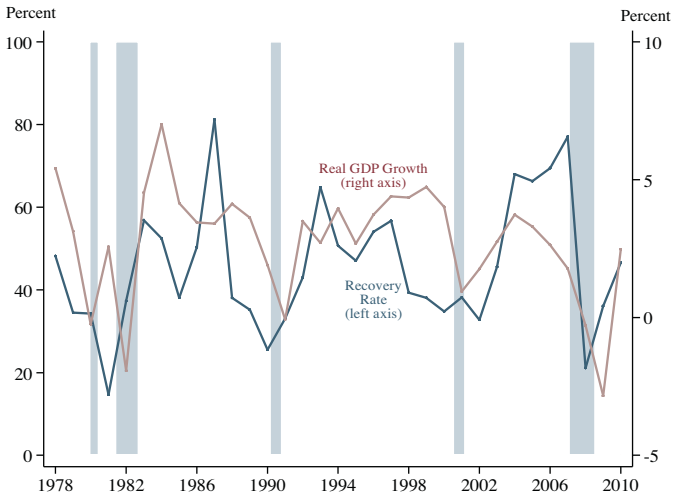

Fig. 2. The recovery rate and the business cycle.
Source: Author's calculations based on Moody's DRS 1970–2008 and Altman and Kuehne (2011) for 2009–10. Real GDP figures are from the St. Louis FRED database (Bureau of Economic Analysis, U.S. Department of Commerce). Recessions (shaded areas) are from the National Bureau of Economic Research (NBER).

provides a framework for macro-based stress testing of recovery risk.

A stylized fact that motivates the first strand of the literature is the observation that the recovery rate is inversely related to the aggregate default rate (Fig. 1). The time series shown in Fig. 1 are aggregate default rates and recovery rates, weighted by the debt amount, following the methodology in Altman and Kuehne (2011).[2] Defaults were clustered during 1982, the early 1990s, the early 2000s, and 2008–09—periods of low recovery rates. Indeed, Giesecke et al. (2011) highlights the clustered nature of corporate bond default events at various times over the longer historical period they examine, including the railroad crisis of 1873–75, the banking panics of the late 1800s, and the Great Depression.

One reason for the inverse relation between the recovery rate and the default rate is common dependence on a systematic factor such as the business cycle. For example, the same adverse economic conditions that cause defaults to rise also depress recoveries. Evidence that the recovery rate is pro-cyclical is shown in Fig. 2, where the shaded areas are recessions. For example, the recovery rate is positively correlated with real GDP growth (correlation coefficient equal to 0.32 over 1978–2010). Previous studies in this first strand of the literature also document a similar macroeconomic dependence, whereby recessions depress bond recoveries by up to one-third from normal-year averages (Frye, 2000; Schuermann, 2005; Fig. 2).

Recent academic literature, however, favors industry and other debt characteristic explanations. A common thread in this strand of the literature is the observation that there is only, at best, "a loose coupling of loss severity to the business cycle," as noted by Schuermann (2014) in his review of the literature. There are several competing alternative explanations, including Acharya et al. (2007). In that paper, conditions in the industry of the defaulting firm are important for recovery on the firm's real assets. In an alternative paper by Altman et al. (2005), conditions in the distressed bond market are important for recovery on the firm's securities because the capacity of financial investors to absorb defaulted securities is limited.

In these and other papers, industrywide downturns contribute to a lower recovery rate through two main channels: fundamentals and illiquidity. First, times of reduced business opportunities in a firm's industry are invariably reflected in lower asset liquidation values. Intuitively, creditor recoveries will depend on the value of the debt collateral. But the collateral, and more generally the economic worth of the defaulted firm's assets, are revised downward in line with an industry downturn. Second, an industry downturn can impose an additional fire-sale discount on the defaulted firm's assets, beyond its effect on fundamental value. In this view, would-be buyers of liquidated assets are likely to be the defaulted firm's industry peers who also are likely financially distressed and unable to buy the liquidated assets. Therefore, distress in the firm's industry limits its peers from bidding on the defaulted firm's assets up to their "value in best use" when managed by industry specialists. Shleifer and Vishny (1992) first developed this market equilibrium approach and described the difference between the price and the best-use value of an asset as "asset illiquidity."[3] Both effects (industry fundamentals and distress) limit the amount that creditors are able to recover from realized or *anticipated* liquidations of a firm's assets.

While these papers focus on industry-specific shocks, a logical consideration is that industry shocks may be endogenous and triggered by an overall weak economy. Indeed, in the original model by Shleifer and Vishny (1992), the shock is allowed to be

[2] Specifically, the default rate is the weighted average default rate on securities in the high-yield market in the United States (underlying data are instrument-level data from the Moody's DRS database). Weights are based on the face value of all high-yield (subinvestment grade) securities outstanding each year (measured at midyear) and the size of each defaulting issue within a particular year. The recovery rate is the aggregate annual weighted average recovery on all defaulted U.S. corporate securities. The weights are based on the defaulted debt amounts. The average default rate over 1978–2010 was 3.8%, and the average recovery rate was 45.7% (comparable to the figures compiled by Altman).

[3] As reviewed in Shleifer and Vishny (2011), while corporate finance theory models of the 1980s began to describe securities in terms of control rights, the liquidation value of collateral was held exogenous, irrespective of constraints affecting the industry-cohort. Following Shleifer and Vishny (1992), a number of studies empirically examined asset fire sales. A classic example is the sale of used airplanes by distressed airlines, where the asset is highly specific to the airline industry. This forces distressed airlines to sell used aircraft at discounts to fundamental values when financial conditions of the airline industry-cohort are also poor (Pulvino, 1998). Benmelech and Bergman (2011) take the argument one step further, showing that the bankruptcy of an airline reduces collateral values for all other airlines with similar airplanes. In other words, the condition of industry peers can itself be endogenous to the default of one of the firms. Firms also try very hard to avoid fire sales in illiquid markets such that debt workouts are more likely than liquidations (Asquith et al., 1994).