Discussion of ‘The Magnitude and Cyclical Behavior of Financial Market Frictions’ by Levin, Natalucci & Zakrajsek

Joseph Pearlman
London Metropolitan University
Helsinki Conference, 2 November 2006

Previous Research on Financial Accelerator

- Incorporation into Macromodels e.g. Bernanke, Gertler and Gilchrist (1999). Net worth affects investment via an arbitrage relationship. System dynamics fit the data better than conventional models of the same type.
- Motivated a further search for the Holy Grail – an indicator that will predict future growth. Mody and Taylor (2003) found that the high-yield (junk bond) spread works well as a countercyclical predictor of economic activity. They find empirically that the financial accelerator operates via both supply and demand.

This is an empirical paper, whose primary aim is to measure financial frictions

Estimated Parameters:

- μ_t – bankruptcy cost parameter, the key financial friction
- σ_{it} – parameter of pdf of productivity shock ω_{it}
- ω^*_{it} – bankruptcy threshold productivity shock
- β_t – parameters measuring the influence of industry fixed effects and of S&P credit rating

Measurements:

Endogenous:

- B_{it}/N_{it} – Leverage, a function of μ_t, σ_{it} and ω^*_{it}
- EDF_{it} – Expected Default Frequency, as constructed by Moody's/KMV, a function of μ_t, σ_{it} and ω^*_{it}
- R^b_t/R_t-1 – Credit spread, a function of μ_t, σ_{it} and ω^*_{it} and of x_t

Exogenous:

- x_t - industry fixed effects and S&P credit rating

Summary of Background Theory

As in Bernanke, Gertler and Gilchrist, entrepreneurs choose capital spending $Q_t K_{it}$ to maximize expected profit, which is dependent on:

- net worth N_{it}
- the risk-free interest rate R_t
- Expected return to capital R_t^k
- Default threshold ω^*_{it} and pdf of ω_{it}
- Bankruptcy parameter μ_t

subject to an equilibrium relationship for the financial sector:

- $\xi_{it} R_t^k Q_t K_{it} = R_t (Q_t K_{it} - N_{it})$

  where ξ_{it} depends on μ_t, σ_{it} and ω^*_{it}

- Technically, this reduces to choosing ω^*_{it} optimally

  This leads to optimal values of
- Leverage B/N where QK=B+N
- Credit spread $R^b/R-1$, where $R^b/R=\xi/\omega^*$

  This allows a calculation of the probability of default
- EDF, dependent on ω^*_{it} and the pdf of ω_{it}

- All of these depend of course on μ

What follows is an outstanding display of detail in creating an appropriate quarterly database based on daily data including:

- Sifting of firms
- Estimation of smoothed yield curve
- Overall credit spread for each firm, taking into account each security, and differential tax treatments
- Debt obligations due in more than one year
- Conversion of annual EDF to quarterly

Summary of Results

- The most intriguing result is the wide variation in bankruptcy costs – from 0 to 0.6. The peaks in this are ascribed to the Russian debt default and collapse of LTCM in 1999, and later in 2002 to the Enron wave of corporate governance crises
- Omitting fixed effects leads to much higher values of μ and much poorer fit
- Implied Recovery rates after bankruptcy are greater than actual
- Testing μ=0 leads to little effect on the NLLS fit, but recovery rates after bankruptcy compare poorly
- Recovery rates are a reasonably good fit without fixed effects

What are the limitations of the analysis?

- Most obviously, the assumption that the probability of default is log-normally distributed, with one free parameter
- No model for the wide variation in the main financial friction
- No clear explanation as to why leverage B/N and default frequency EDF are fitted exactly, but the credit spread R^b/R is not. In principle, a mini NLLS could be undertaken to fit the two parameters σ_{it} and ω^*_{it} to these 3 variables
- The self-criticism via the comparison of actual to fitted recovery rates could be turned to advantage by including this within the estimation.