Bank Leverage, Capital Requirements and the Implied Cost of (Equity) Capital

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Introduction

“The expectation of the market for a ten percent return as the cost of capital was then when the risk-free rate of interest was five percent. And today when the rate of interest is zero, it is the same ten percent when we have more than double the capital, and so are consequently much less risky.” (Lloyd Blankfein)

1. Bank Capital Regulation
   - The global financial crisis triggered significant changes in capital requirements via Basel III
   - Better capitalized banks might be desirable from a social perspective

2. Bank Cost of Equity
   - Increased capital requirements could inflict private costs on banks
   - Relying more on equity financing could increase banks' cost of capital leading to higher lending rates

3. Modigliani-Miller (MM)
   - Government guarantees represent further distortions, not present in other industries

4. Computing the Implied Cost of (Equity) Capital
   - Defined as the discount rate that equates an asset’s market value to the present value of future cash flows, i.e. $P_t = \sum_{k=0}^{\infty} \frac{E_t \cdot (1 + r)^k}{(1 + r)^k}$
   - Five different empirical implementations are employed and the implied risk premium (IRP) computed as $\Delta IRP = IRP - r$

5. Fixed-Effects Panel Regression
   - MM WACC formula is rearranged to estimate the correlation between leverage and the cost of equity $\Delta IRP = \alpha + \beta_1 \cdot \Delta L + \beta_2 \cdot \Delta L^2 + \beta_3 \cdot \Delta L^3 + \epsilon_{t-1}$

6. Difference-in-Differences
   - Estimation of the effect of higher capital requirements in context of the 2011 EBA Capital Exercise
   - Matching estimator as well as standard DID Regression is employed

7. Modigliani-Miller and Banks
   - $\Delta IRP = \alpha + \beta_1 \cdot \Delta L + \beta_2 \cdot \Delta L^2 + \beta_3 \cdot \Delta L^3 + \epsilon_{t-1}$

8. Cost of Equity and Leverage
   - Expectation: Distinctions to bank debt, which do not exist in other industries, make banks’ cost of equity less sensitive to changes in leverage

9. Finding: A one unit change in leverage leads to 5.7 times lower adjustment in the cost of equity of banks than of other firms

10. Evidence from a Quasi-Experiment: 2011 EBA Capital Exercise
    - Institutional Background
      - Announced in October 26, 2011 to restore confidence in and capitalization of the banking sector
      - Included 71 banks such that at least 50% of each EU member state's national banking sector (total assets) is covered
      - Required an increase in core tier-1-ratios from 5% to 9% by the end of June 2012
      - Both timing and magnitude of the increase in capital requirements were unexpected

11. Conclusion
    - Banks’ cost of equity is less sensitive to changes in leverage, indicating an increase in WACC of 10-40bps (relative increase of 3%-12%) if equity increases from 8% to 16%
    - Dissecting bank leverage reveals that equity investors care more about debt than deposit leverage
    - The sensitivity towards changes in debt leverage decreases as the proportion of deposit financing or bank size increases
    - The 2011 EBA Capital Exercise indicates that increased capital requirements not only affect financing costs but assets composition