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Why does capital structure choice vary with macroeconomic conditions?☆

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Abstract

We develop a computable general equilibrium model explaining financing over the business cycle. To avert agency conflicts, managers must hold a high percentage of their firm's equity. During contractions, firms substitute debt for equity in order to maintain managerial equity shares. During expansions, risk-sharing improves, with increases in managerial wealth facilitating substitution of equity for debt. In calibrated simulations, (counter) cyclical variation in leverage is only exhibited by less constrained firms. All firms exhibit financial accelerator effects. However, the effect is decreasing in financial flexibility. The model's predictions regarding financing and investment are consistent with empirical evidence.

JEL classification: G32; G1

Keywords: Financial structure; Financing constraints; Business cycles; Investment

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1. Introduction

In the perfect capital market setting considered by Modigliani and Miller (1958), the financial condition of firms is irrelevant to their real decisions. However, empirical evidence suggests that the balance sheet is not merely a sideshow. For example, corporate investment is increasing in internal funds and decreasing in leverage.[1] This suggests that a better understanding of real activity can be gained through a better understanding of financial policies. Based upon this observation, there is heightened interest among macroeconomists in the determinants of corporate financial structure.

This paper develops a computable general equilibrium model of optimal financing and investment over the business cycle. A critical difference between our model and existing general equilibrium frameworks is that firms are allowed to raise external funds using debt *or equity*. In the models of Bernanke and Gertler (1989), Carlstrom and Fuerst (1997), Bernanke et al. (2000), and Cooley and Quadrini (2006), the only source of external finance is debt. Endogenizing the choice between debt and equity is critical given that our primary objective is to explain observed patterns of security issuance over the business cycle.

It is well-established that loanable funds shift to high-grade firms during tight-money periods and recessions. For example, Kashyap et al. (1993) document a sharp increase in commercial paper issuance following a tightening of monetary policy, while bank loans remain flat. Gertler and Gilchrist (1993) document a relative decline in bank loans to small firms following a monetary contraction. Carey et al. (1993) find that private placements decline relative to public debt flotations during recessions and tight-money periods.

Consistent with this "flight to quality" literature, Korajczyk and Levy (2003) find that the response of firms to cyclical fluctuations depends upon the stringency of financing constraints. Less constrained firms issue debt counter-cyclically and equity pro-cyclically. Consequently, these firms exhibit pronounced counter-cyclical variation in leverage ratios. In contrast, the financing mix of more constrained firms is insensitive to the business cycle. It is natural to ask: Why are such patterns observed, and what are the implications for investment and growth?

In order to address these questions, we present a general equilibrium model incorporating two agency problems that have figured prominently in the theory of corporate finance. First, we assume managers can misreport earnings in order to divert resources from shareholders. This agency cost of outside equity dates back to Berle and Means (1932) and was first modeled formally by Jensen and Meckling (1976). Second, we assume that managers can "tunnel" assets outside the firm, thus diverting resources from bondholders. This agency cost of debt was first discussed by Myers (1977). The empirical relevance of both agency problems is confirmed by recent events at WorldCom, Enron and Tyco.

In the model, the manager can divert resources from outside investors, but must incur deadweight costs in order to do so. In order for the manager to make credible the delivery of promised payments in all states of the world, he must place restrictions on the firm's financial structure. In particular, the manager must hold a minimum share of his firm's equity in order to assure shareholders that he will not divert earnings. In addition, the book leverage ratio must be sufficiently low in order to assure bondholders that the

[1] Fazzari et al. (1988) document the positive response of investment to internal funds. Hennessy (2004) documents the negative effect of debt on investment.