



# Capital structure and competitive position in product market

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## ABSTRACT

This paper examines the effect of capital structure on the competitive position of firms in the product market, as measured by the market share. Theoretical predictions suggest that this effect depends on whether Cournot or Bertrand competition determines firms' interactions. We present evidence that leverage affects market share positively under both types of competitions. This evidence supports the prevailing version of the limited liability effect of debt financing. Alternatively, we demonstrate that a firm's competitive position is important in determining its choice of capital structure.

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## 1. Introduction

Capital structure theories customarily are developed in a single-firm framework and disregard competition intensity among firms in output markets. Theories implicitly assume that by choosing capital structure strategically, firms cannot enhance their competitive positions in output markets. In addition, output markets are assumed to offer an exogenous random return unaffected by firms' choices of capital structure. However, several studies such as Titman (1984), Brander and Lewis (1986), and Maksimovic (1988) examine the strategic choice of capital structure. These studies focus on the strategic role of debt, implying that debt financing shifts output strategies of a firm's rivals in a way that benefits the firm.<sup>1</sup> Using strategic debt characteristics, a firm can enhance its future competitive position in its industry. Alternatively, a debt equilibrium level is determined when benefits equal the agency costs associated with its increase.

Choice of capital structure can affect future competitive position in the manner that Brander and Lewis (1986) refer to as the limited liability effect of debt financing.<sup>2</sup> Because of this principle, managers (shareholders) need to only consider firms' returns during profitable periods, as creditors claim all assets in receivership. In other words, debt financing elevates managers' incentives to adopt riskier output strategies.<sup>3</sup> Hence, debt enhances competitive advantage by enabling firms to pre-commit to a more aggressive output strategy. This suggests that firms can influence their competitive position by strategically using debt. As a result, a firm's capital structure affects competitive interaction among firms in output markets.

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<sup>1</sup> Fudenberg and Tirole (1984) define the strategic role of debt as the ratio change in a rival's profit to change in its own debt level as negative.

<sup>2</sup> The strategic bankruptcy effect also can drive strategies in output markets. Firms can choose products that enhance their chances of driving competitors toward insolvency, and the likelihood that a firm's financial distress depends on its capital structure.

<sup>3</sup> Brander and Lewis (1986) describe this point as follows: as debt levels change, the distribution of returns to shareholders over different states changes, in turn changing the output strategy that shareholders favor.

Although the theoretical literature extensively analyzes the relationships among output strategy, competitive position, and capital structure, little empirical evidence confirms them. Among the empirical literature, Phillips (1995) and Kovenock and Philips (1997) investigate the relationship between intra-industry price variation and a firm's capital structure. Showalter (1995) theoretically demonstrates the conclusion in Brander and Lewis (1986) that firms' strategic incentive to increase debt depends both on the type of competitive interaction among firms in the output market and on the type of uncertainty the firm faces. Based on his earlier theoretical findings (Showalter, 1995), Showalter (1999) verifies the relationship between uncertainty in output markets and the strategic role of debt. MacKay and Phillips (2005) examine the relationship between a firm's capital structure and industry position, defined as the similarity of its capital–labor ratio to its industry's median capital–labor ratio.<sup>4</sup> Lyandres (2006) performs a broad cross-sectional analysis of the relationship between firms' capital structure and the extent of their competitive interaction (whether competition is Cournot or Bertrand).

These prior studies hypothesize that firms will choose a capital structure that enhances their advantage in the output market if debt financing presents a strategic advantage. Hence, these studies investigate relationship between capital structure and intra-industry price variation, uncertainty, industry concentration, and competitive interaction in output market. However, these analyses do not specifically reveal any strategic advantage offered by debt. This paper examines their unanswered question: How does the strategic advantage of debt manifest itself in output markets?

We examine market share as the variable that reflects the strategic advantage of debt because it is an important indicator of competitive position. A firm's objective in the output market is to improve its competitive position. If debt financing offers strategic value, it manifests itself in terms of the firm's improved competitive position. Few previous empirical studies define market share as the indicator of a firm's competitive position in its industry. For instance, Frésard (2010) empirically verifies whether cash holdings have a strategic advantage that improves the competitive position and defines a firm's market share as competitive position.

This paper assumes that a firm's capital structure influences its market share, and vice versa. This assumption originates in the Brander and Lewis (1986) that foresighted firms anticipate the consequences of their financial decisions on output markets; thus, output market conditions influence financial decisions. Our empirical strategy is to verify the relationship between capital structure and market share as an indicator of competitive position within the industry through simultaneous equations in which both variables are endogenous.

Theoretical literature predicts that the nature of competitive interaction among firms affects the relationship between capital structure and competitive position. "Nature of competitive interaction" refers to whether firms engage in Cournot (quantity) or Bertrand (price) competition. Cournot competition corresponds to strategic substitution: a firm complaisantly accommodates a competitor's strategic move. Bertrand competition corresponds to strategic complementarity: a firm escalates competition by matching a competitor's move. If a firm's output strategy is Cournot (substitutional), its reaction function slopes downward, while in the case of Bertrand (complementary), it slopes upward.

Based on this theoretical suggestion, we classify samples into Cournot or Bertrand competition and employ the Competitive Strategy Measure (CSM) to distinguish them. This verifies hypotheses regarding the relationship between capital structure and market share separately for Cournot and Bertrand firms. To this end, hypotheses to be verified are as follows.

Because of the principle of limited liability, increasing debt raises a firm's incentive to adopt a more aggressive strategy. Hence, higher debt induces a Cournot firm to produce more and a Bertrand firm to reduce prices. How these actions affect a firm's market share depends on how rivals react. In the Cournot framework, a rival reduces its output, because Cournot firms compete as strategic substitutes. As a result, the leveraged Cournot firm's market share increases and the rival's market share decreases. In the Bertrand framework, the rival is likely to reduce prices, because Bertrand firms compete as strategic complements. In this case, the market share effects on leveraged Bertrand firms become ambiguous because this hypothesis assumes that competitors simultaneously reduce prices. However, the overall impact on market share becomes clear if firms do not set prices simultaneously, i.e., one is a Stackelberg price leader and the other the follower. The Stackelberg leader's share increases by reducing prices ahead of rivals, because demand for its product increases.

We present testable hypothesis about what the effect of market share on a firm's leverage ratio. Due to the limited liability effect of debt financing, a firm's equity holders have an incentive to prefer riskier output strategies. However, when providing additional funds, debt holders accommodate this effect by requiring a risk premium that increases proportionately to the amount of debt. Evidently a firm's market share increases through leverage; however, there is a simultaneous increase in the agency costs of debt. Hence, lower market share firms seeking to expand their market share generally increase leverage because the strategic benefits from debt outweigh the associated agency costs. However, agency costs exceed the debt benefits with an increase in market share. Hence, the greater the firm's market share, the lower its leverage ratio.<sup>5</sup>

This paper presents evidence for the following findings. Under Cournot competition (strategic substitutes), leverage affects market share positively, implying that leveraged Cournot firms can boost their market share. Similarly under Bertrand competition (strategic complements), leverage significantly and affirmatively affects market share, implying that Bertrand firms can increase market share via debt financing. They have incentives to reduce prices ahead of rivals. Thus, Bertrand competition fits the Stackelberg model.

<sup>4</sup> Their empirical strategy is based upon the idea of a natural hedge presented in Maksimovic and Zechner (1991).

<sup>5</sup> Our hypothesis is based on Bolton and Scharfstein's (1990) suggestion that external financing incurs costs and benefits. As for costs, they suggest that debt makes the firm vulnerable in its product markets. We thank the referee for this suggestion.

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