



# Sensitivity of external resources to cash flow under financial constraints



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## ABSTRACT

This paper explores the external financing–cash flow relationship in capital structure theory by comparing unlisted (financially constrained) and listed (financially unconstrained) companies. We postulate that investment is determined *endogenously* in the case of unlisted firms, as they are strongly dependent on internally generated funds (cash flow). Consequently, unlisted firms invest their cash flow in profitable projects, using any residual cash flow to increase their holdings of safe assets. In turn, listed companies determine their investment *exogenously* and may reduce leverage if they raise an excess of cash flow. As a result, listed companies would react more negatively to shocks in cash flow. Our findings reveal that both unlisted and listed companies show a negative external financing–cash flow relationship, that of the latter being clearly more intense.

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## 1. Introduction

Previous research on capital structure has highlighted the critical impact of financial restrictions when seeking funds (Faulkender & Petersen, 2006; Fazzari, Hubbard, & Petersen, 1988; Hubbard, 1998). More specifically, a number of studies emphasise that financially constrained firms obtain less funds and at a higher cost (Carpenter & Petersen, 2002). Recent empirical literature deems unlisted firms as highly constrained and states that they face more severe information asymmetry problems and boast less financial flexibility than their quoted counterparts (Brav, 2009). While unlisted firms face high flotation and adverse selection costs, listed firms mostly face flotation costs. Furthermore, the former are smaller, less diversified and more opaque. Hence, agency costs are also particularly high in unlisted firms (Smith, 2007).

The main objective of this study is to analyse the sensitivity of external financing to internally generated cash flow and to compare constrained (or unlisted) firms to their unconstrained (listed) counterparts. Over past decades, the pecking order theory has contended that the presence of (asymmetric) information costs

determines a preference hierarchy when choosing capital structure sources. In this sense, internally generated funds (or cash flow) are the first choice (Myers, 1984; Myers & Majluf, 1984). A similar rationale leads firms to choose debt rather than equity. As a result, the pecking order theory should be more plausible for constrained firms than for unconstrained firms due to information asymmetries affecting the former to a greater extent.

Nevertheless, recent empirical research indicates that information costs play a significant role, although they do not tell the whole story. As Almeida and Campello (2010) state, information asymmetries are critical for constrained firms, but irrelevant for unconstrained firms. The latter choose cash flow as their first option merely because of the existence of adjustment costs, particularly flotation costs (Strebulaev, 2007). So how should this circumstance change our conception of the preference hierarchy hypothesis? According to Almeida and Campello (2010), constrained firms are strongly dependent on internal cash flow and are not free to decide on investment. In other words, investment is *endogenous* for this type of company as it can only be decided once internally generated funds are known. In contrast, unconstrained firms are free to choose their investments as they do not face significant adverse selection or agency costs. Hence, investment is *exogenous* for unconstrained firms. Consequently, constrained firms have to “absorb” cash flow shocks and then decide how much investment they can finance. As constrained firms will probably be unable to raise external funds in the future, they maintain the

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current surplus of cash flow (if any) instead of paying off debt. In contrast, unconstrained firms will pay off debt if they generate more cash flow than they need. As a result of this behaviour, both constrained and unconstrained firms will show a negative relationship between external financing (debt or equity) and cash flow, that is, a substitution effect, although this effect will be much more intense for unconstrained firms.

The second objective of this study is to analyse the role of tangibility on the substitution effect. As constrained firms face important adverse selection costs, creditors will demand loan guarantees to protect their contracts. Therefore, constrained firms can be expected to invest their excess cash flow in tangible assets, such as fixed assets or inventories. Hence, we expect tangibility to facilitate new external funds to (particularly) constrained firms. As a consequence, the effect of cash flow on external financing could be more negative for constrained firms, whereas unconstrained or listed firms will remain unaffected.

The third objective of this research is to assess the external financing–cash flow relationship in an economic crisis, such as that of 2008–2010. We assume that constrained firms will find it even more difficult to achieve external funds during a crisis than their quoted counterparts. The reason is that macroeconomic conditions such as scarce resources in financial markets, higher interest rates and the like particularly affect weaker companies (Kiyotaki & Moore, 1997). This problem has become particularly serious in some European Union member states like Spain, the country this study focuses on. Once again, unconstrained firms will remain unaffected by this shock.

Spain meets the requirements for this research and is also a member of the European Union, where the sensitivity of external financing to cash flow has scarcely been studied. A substantial number of Spanish firms are sufficiently large to enter a capital market. However, these companies do not take action to go public. As some researchers have stated, the trade-off between the costs and benefits of being listed on a capital market determines the final decision (Pagano, Panetta, & Zingales, 1998). One of the main disadvantages for many Spanish companies is that their owners have to share the control of the firm with someone else (Álvarez & González, 2005). Therefore, this type of company apparently prefers to stay out of capital markets and face financial restrictions rather than go public. This research aims to shed light on this problem.

In order to analyse all these goals, we have selected two samples of Spanish firms for the period 1996–2010, namely (i) unlisted (or constrained) firms and (ii) listed (unconstrained) firms. Additionally, we have segmented our firms' sample according to size (small firms as constrained and large firms as unconstrained) and credit risk (high credit risk firms as constrained and low credit risk firms as unconstrained) without encountering any significant differences in the empirical results.

Previous empirical evidence on this topic of research is scant. It is worth highlighting the study by Brav (2009), which compares unlisted and listed companies in the British market, although this author's research mainly focuses on capital structure and financial flexibility determinants. Schoubben and Van Hulle (2011) also reported empirical evidence on financial flexibility for listed and unlisted companies on the Belgium capital market, the dependent variable being the variation in external financing. Almeida and Campello (2010) is also a relevant paper that analyses the substitution effect or external financing–cash flow relationship by using a large sample of North American listed companies. It is worth noting that they apply different criteria to split their sample into financially constrained and unconstrained firms. Other studies closely related to this field of research have also provided evidence of the importance of adjustment costs in choosing different sources of financing. Papers worthy of note include Fischer, Heinkel, and Zechner (1989), Altinkiliç and Hansen (2000), Hennessy and

Whited (2005), Leary and Roberts (2005) and Flannery and Rangan (2006).

This paper contributes to the current state of the art in the following ways. Firstly, we provide empirical evidence on external financing–cash flow sensitivity for listed (unconstrained) and unlisted (constrained) companies and compare them. Unlike other papers, this research differentiates between constrained and unconstrained firms following a market-based criterion instead of a firm-characteristics criterion. Thus, it gives practitioners, academics and policy makers a new tool to analyse this relationship from which traditional financing approaches such as pecking order or trade-off hypotheses can be enriched. Secondly, our findings shed some light on the external financing–cash flow sensitivity in the European Union, which has received little attention to date in the literature. Although hypothesis testing is mainly carried out on a sample of Spanish firms, the main model has also been tested by using data from three similar European markets – Italy, Greece and Portugal. Thirdly, we test the external financing–cash flow sensitivity in a unique period partially characterised by a severe economic and financial crisis that has dramatically affected Mediterranean countries like Spain.

Our findings clearly show a negative relationship between external financing and cash flow, the negative effect being higher for listed (unconstrained) companies. This result holds regardless of the external financing definition used (that is, debt, debt plus equity or just equity). We have also tested the role of tangibility in the substitution effect and results are in line with our hypotheses. Moreover, the 2008–2010 period of special financial turmoil is observed to have a noticeable impact on the substitution effect in both constrained and unconstrained firms.

The rest of the paper is organised as follows. The next section analyses the theoretical framework of the study and presents the hypotheses to be tested. Section 3 expounds the empirical models and defines the variables used. Section 4 presents the data for the study and a descriptive analysis. Section 5 explains the econometric methodology and also discusses the results. Section 6 presents some robustness tests and, finally, Section 7 concludes.

## 2. Theoretical foundation and hypotheses

Internally generated funds have achieved currency in the core of most theories of capital structure. Profitable firms frequently raise a significant amount of cash flow. According to the trade-off theory, this type of company will increase leverage in order to take advantage of tax savings. However, the pecking order theory predicts a negative relationship between leverage and cash flow due to the existence of asymmetric information costs, which lead the company to choose internal funds (first) rather than debt (second) and external equity (third) (Frank & Goyal, 2008, chap. 12; Shyam-Sunder & Myers, 1999).

Recently, a different rationale has emerged to explain the external financing–cash flow relationship. Almeida and Campello (2010) developed this new approach, which distinguishes between constrained and unconstrained companies. As indicated above, we assume unlisted companies as being constrained and listed companies unconstrained. While the former are heavily affected by information asymmetries and significant adverse selection costs, the latter are not. Hence, unlisted firms are strongly dependent on internally generated funds and their investment is considered *endogenous*. In contrast, listed or unconstrained companies can decide ex-ante their investment – which is considered *exogenous* – as it does not depend so markedly on the cash flow they generate. As a result, unlisted firms will tend to use their cash flow firstly to finance profitable projects and secondly as fixed assets or working capital and cash. In short, they “invest” their remaining cash flow not used in profitable projects in

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