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Capital structure volatility in Europe

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ABSTRACT

Contrary to the predictions of the trade-off theory, we find that many companies in Europe had substantial variation in their capital structures between 2006 and 2016. We show that this pattern occurred across countries. Companies with the most volatile debt ratios tended to be smaller, and were less profitable. Their high debt volatility was partly due to high volatility in operating and investing activities, and partly due to a reduced propensity to let cash balances and equity payouts absorb the fluctuations.

1. Introduction

According to the static trade-off theory, companies should have a target leverage ratio which balances the benefits and costs of debt. This would imply that firms should try to maintain a particular capital structure, and not deviate much from that level. However, recent research has found that many companies do not seem to pursue this approach. DeAngelo and Roll (2015) have opened a new direction in capital structure research, with their focus on the volatility of debt ratios over time, rather than on their levels. They have found that, in the United States, capital structure stability is the exception, not the rule.

We begin by extending their analysis to Europe, focusing on the period from 2006 to 2016. We examine companies based in the major markets of UK, Germany and France, and also include companies from the PIIGS (Portugal, Italy, Ireland, Greece and Spain) whose capital structures could potentially have been heavily affected by the Credit Crunch and Eurozone Crisis.

We show that, although average debt ratios within countries generally did not change much, there were many companies which experienced substantial changes in their capital structure. We analyse what types of companies experienced the largest changes in debt levels, and which had the highest volatility. We find that small firms, and those with lower returns on assets, experienced the most volatility.

The focus of DeAngelo and Roll (2015) is to demonstrate the surprising amount of debt instability, so they do not extensively examine the causes of this volatility. However, they do speculate that it might be related to the budget constraint. The concept of the budget constraint, whereby a firm's uses of funds must equal its sources of funds, has been discussed at least as far back as Miller and Modigliani (1961), and has also been used more recently by Fama and French (2012), and Gatchev, Pulvino, and Tarhan (2010) in their explanations of why different corporate finance policies may interact. Lambrecht and Myers (2012) also use it to suggest that if firms want to choose their level of capital expenditure and dividends, then they must allow debt to fluctuate as a residual.

We build on this research to introduce the concept of the Corporate Finance Trilemma. A trilemma occurs when it is not possible to choose all policies simultaneously, and has been applied in the context of international finance by Mundell (1963) and Fleming (1962). The Corporate Finance Trilemma arises because companies would like to choose their debt, cash holdings, and equity payout policies simultaneously, but they cannot. The primary source of value for a firm comes from Cash from Operating and Investing activities (CFOI). Nevertheless, companies also pay attention to other aspects of their financial situation, and would ideally like to be able to select optimal policies in all of these areas. However, there exists a cash-flow constraint which means that debt flows, changes in cash holdings, and equity payouts must sum to CFOI. The consequence of this is that companies cannot choose their optimal level of debt without it affecting other policies.

We use the cash flow constraint to explain why some companies have reduced their debt, whilst others have increased it. We find that there is little difference between these companies in terms of cash from operations, dividends, equity issues or repurchases, but substantial differences in terms of investments. Firms which have reduced their debt tended to have low investments, whilst those which increased their debt most had much higher investments.

We show that there is a wide distribution in how much volatility different companies allow in their debt flows. We demonstrate that the volatility of debt flows is partly determined by circumstance. Firms

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Table 1
Total debt/assets ratio by country and year.
The debt ratio is measured by the total debt to total assets ratio. The average for each year is given, per year, for each country in the sample.

	Companies per year	Average total debt/assets ratio										
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
UK	463	17.5	19.0	20.2	19.0	16.9	16.3	16.1	16.5	17.4	18.7	18.9
France	296	21.1	21.6	23.4	22.5	21.1	21.0	20.9	20.6	20.9	21.5	22.2
Germany	277	21.0	21.7	23.0	23.1	21.0	20.5	20.7	21.2	20.8	21.4	21.0
Italy	138	24.9	25.2	27.3	28.2	28.0	29.6	29.0	29.4	28.4	28.8	28.2
Greece	119	30.9	31.9	34.9	34.6	36.2	38.1	38.8	39.5	39.7	41.7	42.6
Spain	61	28.6	27.9	30.6	33.1	32.8	33.2	33.5	34.9	35.4	34.5	32.7
Ireland	38	22.9	19.5	23.0	22.8	23.0	20.3	21.3	21.4	20.1	19.5	17.4
Portugal	30	39.8	39.3	43.1	43.7	41.2	43.5	44.1	37.1	39.2	38.8	37.2
Total	1422	21.9	22.5	24.4	23.9	22.6	22.6	22.6	22.8	23.0	23.8	23.8

with low volatility in debt tend to also have relatively low volatility in most of the other cash flow components. However, debt volatility is also heavily influenced by the choices of the firm. Some companies prioritise debt stability, and do not allow debt to fluctuate in response to changes in CFOI. We show that the beta of debt to CFOI is almost zero for companies with the lowest volatility. This means that equity payouts and changes in cash balances must respond to these fluctuations. Other companies give precedence to managing cash holdings and equity payouts, but this means that debt must absorb any changes, making it more volatile. Firms with a high debt volatility have a beta of debt to CFOI which is significantly higher, whilst their beta of equity payouts to CFOI, and changes in cash balances to CFOI, are significantly lower.

This paper makes a substantial contribution beyond the existing research in this area. It moves beyond DeAngelo and Roll (2015) in several ways. Firstly, we consider Europe, and show that many companies changed their capital structures considerably, and that high debt volatility is common outside of the United States. Secondly, we explain why this occurred. We show that it arises because these companies have high cash flow volatility *and* because the companies have refused to let cash balances and equity payouts fluctuate enough to absorb this volatility. Thirdly, in contrast to DeAngelo and Roll (2015), we also emphasise that many other companies have very stable debt levels. We demonstrate that this is a result of low operating cash flow volatility *and* because the companies have allowed cash balances and equity payouts to absorb any volatility that does exist.

Several other papers have noted that a budget constraint implies that there will be interaction between different corporate finance policies (Fama & French, 2012; Gatchev et al., 2010; Miller & Modigliani, 1961). Lambrecht and Myers (2012) use it to suggest that debt is likely to be treated as a residual. However, we move beyond this in several important ways. Firstly, we argue that for many companies it is actually debt which is kept stable, whilst other components are forced to act as the residual. This adjustment to the model makes it much more flexible in terms of explaining the spectrum of firm behaviour. Secondly, we develop a model in terms of variances and covariances, rather than levels, which provides a much greater insight into the interactions between the components of the budget constraint, and allows the model to be analysed empirically. Thirdly, we test our model empirically and obtain novel results. We find that it is both operating and investing cash flow volatility *and* the response of firms which matter for debt volatility. We also find that it is smaller and riskier firms which are more likely to have higher debt volatility.

This paper also helps to place the enduring debate about the static trade-off and pecking order theories within a broader framework. A large volume of research has found support for and against each theory. For example, Fama and French (2012) suggest that there is a target debt level but the movement towards it is sluggish. Lemmon, Roberts, and Zender (2008) also argue that there are target leverage levels, as firms remained in similar bands of debt over two decades, whilst Byoun (2008) finds that target debt levels are present and that firms move towards this during times of a surplus or deficit. However, DeAngelo and Roll (2015) find little evidence of a target debt level. Previously, Graham and Harvey (2001) have also noted that only 10% of firms reported that they tried to maintain a very strict target ratio. De Jong, Verbeek, and Verwijmeren (2011) find that firms seem to use the pecking-order theory when they need to raise capital, but follow the trade-off theory when they reduce capital. They state that firms will issue debt to increase their leverage but when considering repurchase decisions, firms will repurchase equity.

The variation in the literature suggests that there are some cases where there is a target debt level, and others where there is not. Fama and French (2005) note that both the trade-off and pecking order theories have serious problems, and put forth the idea that they could be complements to each other instead of two stand-alone theories. This paper concurs with this suggestion. It argues that some firms do maintain stable capital structures, possibly motivated by the trade-off approach. Other firms use debt extensively, possibly motivated by the pecking order theory cautioning against issuing external equity. However, these individual theories need to be combined into a much broader framework, to understand that the capital structure of a firm will also be considerably affected by the volatility of its CFOI, and its optimal policies on cash balances and equity payouts.

2. Data and instability results

We collected firm-specific data from Bloomberg for companies domiciled in the UK, Germany, France and the PIIGS, between 2006 and 2016. We include all companies which had cash flow information available for each year of the sample period but, as is common in capital structure studies, financial firms were excluded. All variables from the cash-flow statement were included for each company for each year, and were scaled by total assets. The analysis focuses on the change and volatility of these variables over this period, so only those companies which had this data for the full sample period were included. The final sample consists of 1422 companies.

Table 1 shows the average total debt to assets ratio, for each year, for each country. The UK stays generally around 16–19% for most of the sample but has an increase around the financial crisis. Similarly, France remains around 21%, with a small increase in 2008 to 23.4%. The results are similar for most of the countries in the sample, with a somewhat constant debt ratio with a small spike around the financial crisis. However, Greece's total debt to assets ratio increases throughout the years of our sample from 30.9% in 2006 to 42.6% in 2016. Spain increases from 2006 until 2014 and then begins to fall.

Some examples of volatility in the capital structures of individual companies can be seen from Fig. 1, which plots the total debt to assets ratios of two sample companies. For Danone, the total debt to assets ratio rises, falls, then fluctuates somewhat for a few years, another sharp increase. For ITV the debt ratio rises, falls and then rises again.

To assess the extent to which capital structures change, a