Financial Constraints and Leverage Decisions in Small and Medium-Sized Firms

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Abstract: This paper studies the leverage decisions of small and medium-sized manufacturing firms in the UK. The relationship between debt and cash flow is studied in the light of both internal and overall financial constraints. Internal financial constraints are defined as those constraints internal to the firm that influence its financing decisions. These measures include the cash flow and profitability of the firm. Overall financial constraints account for both internal financial constraints and external financial constraints, which in turn are accounted for by conventionally used measures of financial constraints such as the size of the firm measured by the real assets and the riskiness of the firm. Results obtained indicate that firms follow a financial hierarchy when deciding what sources of finance to use. Internal financial constraints measured by the availability of internal funds are important factors that affect the relationship between debt and cash flow.

Keywords: *Leverage, profitability, small and medium-sized firms, financial constraints*

1. Introduction

This paper studies the relationship between debt and cash flow, the two main sources of finance for most firms by taking into account the internal and overall financial constraints that firms face. Unlike previous studies, we focus on both internal and overall financial constraints and focus on Small and Medium-Sized firms (SMES) as these firms are likely to suffer more from financial constraints. Distinguishing between internal and overall constraints enables us to understand which constraints are more important. Internal constraints refer to those constraints that determine whether a firm would go for external financing. Hence, in this case, the level of internally generated funds (mainly cash flow) would determine the amount of debt that a firm has in its capital structure. The other factor that would determine the amount of debt in the capital structure of firms is the overall financial constraints that firms might face, which refer to how easy or how difficult it is for firms to have access to external financing. Our results suggest that firms follow a financial hierarchy when deciding what sources of finance to use. Internal financial constraints are important factors that influence the amount of debt that a firm has in its capital structure. The results obtained also seem to suggest that however large a firm might be and however easy it is for a firm to have access to debt, firms inherently do not like to increase debt in their capital structure. The rest of the paper is organised as follows: section 2 presents a brief review of literature on the financing decisions of firms and the impact of financial constraints on their decisions. In section 3 the dataset and empirical specification is discussed. Section 4 elaborates on the descriptive statistics. In section 5, we discuss our estimation methodology and results. Finally, section 6 concludes.

2. Literature Review

Fazzari, Hubbard, and Petersen (1988) are considered the first study that tried to classify firms according to different degrees of financial constraints. They consider firms with low dividend payout ratios to be financially constrained. Kaplan and Zingales (1997) using alternative indicators of financial constraint, question the classification of Fazzari, Hubbard and Petersen (1988). Several other researchers have contributed to the debate on financial constraints including Cleary (1999); Fazzari Hubbard and Petersen (2000); Kaplan and Zingales (2000); Allayannis and Mozumdar (2004); Cleary et al., (2007). Recently the literature on financial constraints has tried to distinguish between internal and external financial constraints and has reached a consensus where criteria such as firms' size, age, dividend payout ratio, or information on whether firms have a bond rating and/or access to commercial paper are seen as proxies of the extent to which firms are susceptible to the effects of information asymmetries, which translate themselves in

difficulties in obtaining external funds. On the other hand, factors such firms' liquidity, which is correlated with the level of internal funds available to, firms are used as proxies of the extent to which firms face internal financial constraints. Guariglia (2008) for instance, studies the extent to which the sensitivity of investment to cash flow differs at firms facing different degrees of internal and external financial constraints. The effects of "internal" financial constraints are captured by the availability of internal funds, cash flow, coverage ratio while "external" financial constraints is captured through access to external finance on firms' investment using proxies such as the firms' size and age.

The capital structure literature has tried to study the effect of financial constraints on leverage decisions with most of the literature focusing on the relation between profitability and leverage levels and the negative association between the availability of internal funds and the use of external finance. Leary and Roberts (2005), find that firms that have high cash flows or high cash balances are less likely to issue (and are more likely to retire) both debt and equity. Leary and Roberts (2005), like much of the literature, interpret the existing findings as evidence supporting the pecking order theory (Myers (1993) and Fama and French (2002)). According to the pecking order, firms prefer to finance investments with internal funds, because asymmetric information increases external financing costs (Myers and Majluf (1984) and Myers (1984)). A preference for internal over external funds would then generate a negative relation between internal cash flows and external financing: firms that are more profitable require less external financing, and should thus show lower security issuance activity. However, Almeida and Campello (2007) point out that the negative relationship between internal finance and debt may not be as straightforward as proposed by the pecking order theory. Following increases in profitability, a financially constrained firm may not reduce its demand for external funds. Constrained firms should display a less negative relation between the availability of internal funds and the demand for external funds, relative to similar firms that do not face strong financing frictions, that is externally unconstrained firms. These complementarities between internal funds and external financing thus arise from the interdependence of financing and investment decisions.

Data and Empirical Specification: The dataset used is a sample extracted from the *Financial Analysis Made Easy* (FAME) database. We have data on 13,556 unquoted manufacturing firms that adds up to 81,556 firm-year observations. Our sample has an unbalanced structure and the number of years of observation varies between 3 and 10. The baseline specification that we use is as follows:

$$(LEV/A)_{it} = \beta_0 + \beta_1 (LEV/A)_{it-1} + \beta_2 (Cash\ Flow/A)_{it} + \beta_3 (Log\ Sales)_{it} + \beta_4 (Sales\ Growth)_{it} + \beta_5 (Structure)_{it} + \beta_6 (TAX)_{it} + v_i + v_t + \varepsilon_{it} \quad (1)$$

where i indexes firms, $i=1,2,3,...,N$ and t indexes years, $t=1,2,3,...,T$

LEV/A is the book leverage (short-term debt plus long-term debt) of the firm scaled by assets, $CashFlow/A$ is the firm's after tax and interest cash flow scaled by assets, $Log\ Sales$ is the log of sales that controls for size effects, and $Sales\ Growth$ controls for growth opportunities. We rely on the *structure* variable to control for asset structure and finally *Tax* controls for the effect of taxes on capital structure. Since we use panel data, we include both a firm specific and time specific error term. Hence, the error term consists of three components: v_i is a firm-specific fixed effect that controls for unobserved time-invariant characteristics, v_t represents a time specific component and reflects aggregate effects common across companies to control for macroeconomic influences, including factors as nominal interest rates and inflation, ε_{it} is an idiosyncratic error term

Effects of Financial Constraints on the Relationship between leverage and cash flow: Financial constraints are important factors that influence capital structure decisions of firms. Two main factors affect whether or not a firm goes for external financing (in this case debt). First, it depends on whether the firm really needs external financing and this would be determined by the amount of internal funds. Internal constraints would therefore influence the amount of debt that a firm ultimately needs. For instance, an internally financially constrained firm is likely to have more debt in its capital structure than a firm that is not internally financially constrained. The second factor that would affect external financing is whether the firm can have access to external financing (whether or not lenders are willing to lend to this firm.) This can be addressed by taking into account overall financial constraints, that is, how easy it is for a firm to get external finance. Factors like firm size and the amount of collateral that a firm can provide gives a good measure of overall constraints. The presence of both internal and overall financial constraints affects the sensitivity of

leverage to cash flow. It is not possible to explicitly include a variable in our empirical specification to account for the presence of internal and overall financial constraints on firm behaviour. There is therefore the need to rely on the use of proxies as discussed in the next section. Extensive use of various classification schemes are made to capture these two types of constraints.

Classification Schemes: A number of different criteria are used to differentiate among various classes of firms. First firms are divided according to measures of cash flow to capture internal financial constraints. As a robustness check, a profitability measure is used. Firms are then divided in size classes by using the real assets of firms. A riskiness measure is then used to check for robustness. The first sample separation criterion, motivated from Guariglia (2008) and to a certain extent from Povel and Raith (2002) is the distribution of real cash flow of the firms, which is used as a measure of internal financial constraint. First firms-years are divided into two classes, those that have positive cash flows and those that have negative cash flows¹. Firm-years that have positive cash flows are then further sub-divided into 2 separate classes so that three distinct classes of firms are obtained. Those firms that have negative cash flows in any firm-years are classified as *INTERNALLY VERY FINANCIALLY CONSTRAINED* ($IVFC_{it}$)². Next firm-years that have positive cash flows are classified. Firms that have their positive real cash flows in the bottom 25th percentile of the distribution of the positive real cash flows of all firm-years are classified as *POSSIBLY NOT INTERNALLY FINANCIALLY CONSTRAINED* ($PNIFC_{it}$). All firms having their real cash flow above the 25th percentile of the distribution of the positive real cash flows of all firm-years are classified as *NOT INTERNALLY FINANCIALLY CONSTRAINED* ($NIFC_{it}$). As a robustness check, we use the profitability of firms and classify them according to the similar criteria as discussed above.

To distinguish internal financial constraints from overall financial constraints, the sample separation criterion that is used, based on the size of the firm, is the distribution of real assets of the firms. Firms that have a high level of real assets or tangible assets are larger and have more collateral and these firms are expected to have fewer difficulties in obtaining external finance as lenders are more willing to lend to these firms. It should be noted that these financial constraints measures also capture internal constraints, as a firm will only turn towards external financing if alternative cheaper internal financing is not available. Hence, the financial constraint measures used account for both internal and external constraints and can be assumed an overall measure of financial constraints. As above, three different categories of firms are considered. Those firms that have their real assets in the lowest 25th percentile of the distribution of the real assets of all firm-years are classified as *FINANCIALLY CONSTRAINED*_{it} (FC_{it}), as these firms have insufficient internal finance and face difficulties to get access to external finance. Firms that have their real assets between the 25th and the 75th percentile of the distribution of the real assets of all firm-years are classified as *LESS LIKELY TO BE FINANCIALLY CONSTRAINED*_{it} ($LLFC_{it}$) as it is unlikely that these firms would have any difficulties to get access to external financing. All firms having their real assets in the top 25th percentile of the distribution of the real assets of all firm-years are classified as *NOT FINANCIALLY CONSTRAINED*_{it} (NFC_{it}) as these firms can get access to external finance easily.

To capture financial constraints (both internal and external), another sample separation criterion used is the Quiscore, a measure of the riskiness of firms³. The Quiscore is a measure of the likelihood of company failure in the twelve months following the date of calculation and this measure is used to account for overall financial constraints. Companies that have Quiscore value between 40 and 0 are unstable and high-risk companies and these companies are classified as *RISKY*_{it}. Companies that have Quiscore between 80 and 41 tend to be stable and normal companies and we classify these companies as *SAFE*_{it}. Companies that have Quiscore in the range 81-100 are believed to be secure companies and we classify these companies as *SECURE*_{it}.

Descriptive Statistics: Table 1 presents the descriptive statistics. (LEV/A) is the book leverage (short-term debt plus long-term debt) of the firm scaled by assets, (STD/A) is short-term debt while (LTD/A) is long-term debt, both scaled by assets. (CF/A) is the firm's after tax and interest cash flow scaled by assets, ($Log Sales$) is

¹ By focussing on firm-years we allow firms to transit between classes, therefore a firm can have negative cash flow in one year and positive cash flow in another year and so on...

² Note that all the firms are classified by industry and year.

³ See Data Appendix for further details on how this measure is calculated.

the log of sales that controls for size effects. We rely on a sales growth measure (*Sales Growth*) to control for growth opportunities. (*Structure*) is an asset structure variable that controls for the level of collateral and finally (*Tax*) controls for the effect of taxes on capital structure. As expected, SMEs have quite high overall leverage at 33% with long-term debt representing 15% of assets and short-term debt at 20.8% of assets. The reliance of SMEs on debt can be explained by the fact that unlike their quoted counterparts, these firms cannot issue shares on the stock market. They are therefore constrained in their financing choices. Cash flow is also quite high at 11% of assets.

Table 1 also presents the descriptive statistics of the firms according to their degree of internal financial constraints as measured by the different levels of cash flow. Firms with negative levels of cash flow have much higher overall debt (45%), compared to that of firms with positive cash flows. These summary statistics suggest an inverse relationship between debt and cash flow; however, this has to be further investigated. They also point out that SMEs are much more debt dependent. The summary statistics also suggest that firms do not face any problems in getting access to debt finance. Firms that have negative cash flow have high debt. In columns (5), (6) and (7) of Table 1, we consider overall financial constraints, measured by the level of real assets. As can be observed, there is not a very pronounced difference in cash flows in firms of different sizes. However, larger firms have higher long-term debt at 19% of assets, indicating perhaps that these firms can afford to have higher debt because they are larger and can secure debt more easily.

Table 1: Summary Statistics

	Full Sample (1)	Negative cashflow (2)	Medium cashflow (3)	High cashflow (4)	Small Firm-years (real assets) (5)	Medium Firm-years (real assets) (6)	Large Firm-years (real assets) (7)
No. of observations	80718	8727	16283	50591	22552	48624	22680
$(LEV/A)_{it}$	0.330 (0.206)	0.454 (0.227)	0.379 (0.218)	0.293 (0.183)	0.293 (0.195)	0.314 (0.198)	0.390 (0.219)
$(Cash\ Flow/A)_{it}$	0.117 (0.112)	-0.071 (0.069)	0.043 (0.029)	0.173 (0.083)	0.126 (0.126)	0.117 (0.109)	0.110 (0.109)
$(Profit/A)_{it}$	0.051 (0.086)	-0.100 (0.065)	0.004 (0.029)	0.091 (0.061)	0.057 (0.099)	0.051 (0.082)	0.046 (0.083)
$(Log\ Sales)_{it}$	8.978 (1.177)	8.914 (1.177)	8.949 (1.152)	9.019 (1.179)	7.658 (0.546)	8.695 (0.658)	10.226 (0.908)
$(Sales\ Growth)_{it}$	0.077 (0.318)	-0.214 (1.182)	-0.061 (1.057)	0.043 (1.034)	-0.204 (1.835)	-0.000 (0.943)	0.054 (0.642)
$(Structure)_{it}$	0.300 (0.192)	0.275 (0.195)	0.284 (0.195)	0.309 (0.187)	0.264 (0.184)	0.313 (0.193)	0.308 (0.191)
$(Tax/Profit)_{it}$	0.341 (0.428)	0.229 (0.366)	0.258 (0.677)	0.383 (0.321)	0.303 (0.403)	0.348 (0.413)	0.351 (0.467)
$(Real\ Assets)_{it}$	11102.83 (26267.61)	13791.87 (28747.11)	13245.22 (29954.65)	11487.49 (24085.79)	1099.182 (488.162)	4162.246 (2463.931)	35930.05 (44977.63)
Employees	177.721	185	164	182	42	91	404

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript i denotes firms and the subscript t denotes time and $t=1994-2003$.

Descriptive statistics are presented for the full sample and for firm-years that have negative cash flow that are *Internally Very Financially Constrained* (cash flow<0), firm years that are *Possibly not Internally Financially Constrained* (positive cash flow in the lowest quartile of the distribution of all positive cash flows, classified by industry and year) and firms that are *Not Internally Financially Constrained* (all firms having the

cash flow in the top three quartiles of the distribution of all positive cash flows of all firms, classified by industry and year). Columns (5), (6) and (7) present descriptive statistics for firm-years that are *SMALL*_{it} (real assets in the lowest 25th percentile of the distribution of the real assets, classified by industry and year), firm years that are *MEDIUM*_{it} (real assets between the 25th and the 75th percentile of the distribution of the real assets, classified by industry and year) and *LARGE*_{it} (all firms having the real assets in the top 25th percentile of the distribution of all assets, classified by industry and year).

3. Methodology

The Ordinary Least Squares (OLS) method ignores both firm-specific heterogeneity and potential endogeneity of regressors. The OLS estimator is likely to be inconsistent since the explanatory variables are positively correlated with the error term. Due to the presence of individual effects, the correlation does not vanish even as the size of the sample increases. On the other hand, the Within Groups estimator takes account of firm-specific heterogeneity but ignores potential endogeneity of regressors. The Within Groups estimator eliminates the source of inconsistency by transforming the equation to eliminate the individual (time invariant) effects. However, even if the Within Groups estimator takes into account firm heterogeneity, it fails to take into account the potential endogeneity of the regressors. Bond (2002) shows that at least in large samples the coefficient on the lagged dependent variable using the OLS estimator is biased upwards while the Within Groups estimator is biased downwards. The OLS and Within Groups estimator are likely to be biased in opposite directions.

This implies that if the coefficient obtained on the lagged dependent variable using the GMM estimator lies between the coefficient obtained using the OLS estimator and the Within Groups estimator, then the GMM estimator is the correct one to use which also takes into account both firm-specific heterogeneity and potential endogeneity of regressors (Arellano and Bond, 1991). Our instrument set includes $(LEV/A)_{it}$, $(Cash\ Flow/A)_{it}$, $(Log\ Sales)_{it}$, $(INV/A)_{it}$, $(Q)_{it}$ and $(Tax)_{it}$ which are lagged 2 to 5 times. We use the Sargan test and the m2 to evaluate if our model is correctly specified. The J statistic is the Sargan/Hansen test for over identifying restrictions. Under the null of instrument validity, the J statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of instruments less the number of parameters. If the model used is correctly specified and the instruments are adequate, the variables in the instrument set should not be correlated with the idiosyncratic component of the error term ε_{it} . On the other hand, the m2 test, which tests for second-order serial correlation, is asymptotically distributed as standard normal under the null of second-order serial correlation. This test provides a further check on the specification of the model and on the validity of variables dated t-2 as instruments. If the p-values for the Sargan test and the m2 test are both greater than 0.05, then the instruments are acceptable.

4. Results

The results obtained, shown in Table 2, give more support to the POT. The empirical evidence points towards a negative relationship between debt and cash flow. Firms that have more internal funds (cash flow) have less debt in their capital structure (indicated by the negative and highly significant coefficient on the cash flow variable of -0.259) which is consistent with the POT. A one standard deviation change in cash flow is likely to bring about a 3% change in the debt level. Larger firms have less debt indicated by the negative and significant coefficient of -0.106 on the sales variable suggesting that larger firms are less debt-dependent, finding which is in accordance to the POT (Titman and Wessels (1988), Benito (2003)). The coefficient on the growth variable is not significant indicating that retaining debt capacity is not really a priority for SMEs. This might also suggest that these firms are myopic and they cannot perfectly foresee growth opportunities. The tax variable is also insignificant suggesting that tax considerations are not very important for SMEs in the UK as most of them normally benefit from low tax rates.

Table 2: Regression Results First Difference GMM Estimators

	(1)	Robustness Checks (2)
$(LEV/A)_{it-1}$	0.486** (0.026)	0.492*** (0.026)
$(Cash\ Flow/A)_{it}$	-0.259*** (0.082)	
$(PROFIT/A)_{it}$		-0.372*** (0.113)
$(Log\ Sales)_{it}$	-0.106*** (0.025)	-0.104*** (0.025)
$(Sales\ Growth)_{it}$	-0.018 (0.021)	-0.204 (0.022)
$(Structure)_{it}$	0.043 0.107	0.038 0.106
$(Tax/Profit)_{it}$	0.014 (0.020)	0.005 (0.020)
Sample size	14955	15102
J	0.934	0.944
m2	0.237	0.403

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as $N(0, 1)$ under the null of no serial correlation. The J statistic is a test of the over identifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(LEV/A)_{it-1}$, $(Cash\ Flow/A)_{it}$, $(Log\ Sales)_{it}$, $(Sales\ Growth)_{it}$, $(Structure)_{it}$ and $(Tax)_{it}$ all lagged two to three times. Time dummies are included in all specifications as repressors and instruments. Also, see notes to Table 1. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

The coefficient on the structure variable is insignificant suggesting that the amount of collateral that a firm can provide has no influence on its debt level. Although this seems strange, it can be explained by the fact that manufacturing firms have assets that are “specialised” and cannot really serve as collateral (Schaller, 1993 and Guariglia, 2008). As a robustness check, another proxy for the level of internally generated funds is used by considering the profitability of firms. The results (shown in column 2 of Table 2) are robust to the ones obtained previously and point towards a negative relationship between the debt level and profitability.

Accounting for internal financial constraints: Next, we investigate how different levels of cash flow at firms affect the relationship between firm leverage and cash flow. The *IVFC*, *PNIFC* and *NIFC* dummies are used in the leverage regressions as interactions on the cash flow term, the aim being to investigate how having different levels of cash flow influences the relationship between debt and cash flow. In this way, firms are also allowed to transit between classes (Guariglia 2008). The use of interaction terms on the cash flow variable avoids the need to run separate regressions on sub-sample of firms with different levels of cash flow. Additionally, the problems of endogenous sample selection are avoided and degrees of freedom are gained. The following specification is used:

$$(LEV/A)_{it} = \beta_0 + \beta_{11}(LEV/A)_{it-1} * IVFC_{it} + \beta_{12}(LEV/A)_{it-1} * PNIFC_{it} + \beta_{13}(LEV/A)_{it-1} * NIFC_{it} + \beta_{21}(Cash\ Flow/A)_{it} * IVFC_{it} + \beta_{22}(Cash\ Flow/A)_{it} * PNIFC_{it} + \beta_{23}(Cash\ Flow/A)_{it} * NIFC_{it} + \beta_3(Log\ Sales)_{it} + \beta_4(Sales\ Growth)_{it} + \beta_5(STRUC)_{it} + \beta_6(TAX)_{it} + v_i + v_t + \varepsilon_{it} \quad (2)$$

Where the variables are as defined previously and the lagged dependent variable and the cash flow variable are interacted in turn with the dummy variables *IVFC*, *PNIFC* and *NIFC*⁴.

⁴ *IVFC* firms are *VERY INTERNALLY FINANCIALLY CONSTRAINED* (negative cash flow). *PNIFC* firms are *POSSIBLY NOT INTERNALLY FINANCIALLY CONSTRAINED* (cash flow in the lowest quartile of the distribution). *NIFC* firms are *NOT INTERNALLY FINANCIALLY CONSTRAINED* (cash flow in the top 3 quartiles of the distribution of all positive cash flows.)

As discussed previously, *IVFC* firms (firms with negative cash flow) would possibly have more debt in their capital structure leading to a positive relationship between debt and negative cash flow for these firms. However, it might also be the case that these firms would avoid taking debt (due to inability to service debt) in which case the relationship between leverage and negative cash flow would be negative. For the *PNIFC* and *NIFC* firms (firms with positive cash flow), we would expect the relationship between leverage and cash flow to be positive if the TOT holds but negative if the POT holds. To check the robustness of our results, we use a similar regression but the cash flow variable is replaced with a profitability measure. In column 1 of Table 3, we investigate how internal financial constraints affect the debt level in unquoted firms. The results generally point towards a negative relationship between debt and cash flow for all the three categories of firms defined previously. There is a negative relationship between negative cash flow and debt. This suggests that as negative cash flow goes up (that is there is a deterioration in the internal finance of the firm) firms reduce debt in their capital structure. What this result essentially says is that the higher the negative cash flows of a firm, the less debt it will have in its capital structure. This would imply that debt servicing is a very important factor that firms take into account while deciding what sources of finance to use.

Firms that have negative cash flows might be debt dependent but they might also be debt conservative as they might not want high debt levels which can possibly lead to bankruptcy. As negative cash flow decreases, the firm starts to borrow (possibly due to an improvement in its balance sheet situation) and consequently has higher debt in its capital structure. The coefficient on the cash flow variable for firms with medium cash flows (*PNFC firm-years*) although positive (0.108) is insignificant. Hence, we cannot really say what is happening to debt levels in these firms. It could possibly be the case that these SMEs being more debt dependent cannot really reduce debt in their capital structure even when they have positive but low levels of cash flows. For firms that have high cash flows (*NFC firm-years*), there is a negative and significant relationship between cash flow and debt (-0.251) that confirms the POT suggesting that firms that have positive cash flows tend to reduce debt in their capital structure as they experience an improvement in their internal financing capacity. The magnitude of coefficients -0.651 for *IFC* firms, and -0.251 for *NFC* firms, suggest that firms that have negative cash flows are much more debt conservative as a deterioration in their balance sheet would lead them to reduce debt by a more significant amount than firms that have positive cash flows. Firms with positive cash flows tend to reduce debt in their capital structure when they experience an increase in cash flows but they still remain quite debt dependent.

Table 3: Regression Results Accounting for Internal Financial Constraints

	(cash flow) (1)	ROBUSTNESS CHECKS (profitability) (2)
$(LEV/A)_{it-1} * IVFC_{it}$	0.339*** (0.075)	0.342*** (0.066)
$(LEV/A)_{it-1} * PNIFC_{it}$	0.363*** (0.059)	0.409*** (0.056)
$(LEV/A)_{it-1} * NIFC_{it}$	0.375*** (0.041)	0.411*** (0.044)
$(Cash\ Flow/A)_{it} * IVFC_{it}$	-0.651*** (0.237)	-0.676*** (0.237)
$(Cash\ Flow/A)_{it} * PNIFC_{it}$	0.108 (0.384)	-1.098 (0.953)
$(Profit/A)_{it} * PNIFC_{it}$		
$(Cash\ Flow/A)_{it} * NIFC_{it}$	-0.251*** (0.083)	-0.519*** (0.125)
$(Profit/A)_{it} * NIFC_{it}$		

$(\text{Log Sales})_{it}$	-0.086*** (0.021)	-0.094*** (0.213)
$(\text{Sales Growth})_{it}$	0.005 (0.014)	0.000 (0.014)
$(\text{Structure})_{it}$	0.148** (0.077)	0.090 (0.078)
$(\text{Tax})_{it}$	0.013 (0.015)	0.008 (0.013)
Sample size	14995	15102
m2	0.365	0.862
J(p-value)	0.553	0.894

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as $N(0,1)$ under the null of no serial correlation. The J statistic is a test of the over identifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used in column 1 are $(\text{LEV}/A)_{it-1} * \text{IVFC}_{it}$, $(\text{LEV}/A)_{it-1} * \text{PNIFC}_{it}$, $(\text{LEV}/A)_{it-1} * \text{NIFC}_{it-1}$, $(\text{CF}/A)_{it} * \text{IVFC}_{it}$, $(\text{CF}/A)_{it} * \text{PNIFC}_{it}$, $(\text{CF}/A)_{it} * \text{NIFC}_{it}$, $(\text{Log Sales})_{it}$, $(\text{SalesG})_{it}$, $(\text{Structure})_{it}$ and $(\text{Tax})_{it}$ all lagged two to five times. In column 2, the instruments used are $(\text{LEV}/A)_{it-1} * \text{IVFC}_{it}$, $(\text{LEV}/A)_{it-1} * \text{PNIFC}_{it}$, $(\text{LEV}/A)_{it-1} * \text{NIFC}_{it-1}$, $(\text{Profit}/A)_{it} * \text{IVFC}_{it}$, $(\text{Profit}/A)_{it} * \text{PNIFC}_{it}$, $(\text{Profit}/A)_{it} * \text{NIFC}_{it}$, $(\text{Log Sales})_{it}$, $(\text{SalesG})_{it}$, $(\text{Structure})_{it}$ and $(\text{Tax})_{it}$. Time dummies are included in all specifications as repressors and instruments. Also see notes to Tables 1 and 2. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. The F-statistics obtained on the lagged dependent variables in column 1, $(F(3, 4798) = 34.39)$ indicate that the coefficients obtained for the *IVFC*, *PNIFC* and *NIFC* firm-years are statistically different from each other. The F-statistics obtained on the cash flow variable in column 1 interacted with the *IVFC*, *PNIFC* and *NIFC* firm-years $(F(3, 4798) = 7.28)$ again indicate that the coefficients obtained are statistically different from each other.

Similar results are obtained when as robustness check; we consider profitability as a measure of internal finance (column 2 of Table 3). These results suggest that although SMEs are a more debt dependent, they avoid taking debt when they have high negative cash flows and repay debt when they experience an increase in their cash flows. These points towards a debt-conservative behaviour of firms in those internally generated funds are the most preferred source of financing of firms whatever the level of their cash flows. It also indicates that firm are financially conservative and they inherently do not like debt in their capital structure.

Accounting for (Overall) Financial Constraints: In this section, we examine the impact of both internal and external constraints on debt policy decisions of firms. To account for the presence of overall financial constraints, we interact the cash flow term with size measures. First, we distinguish among firms by classifying them according to the distribution of their real assets. We investigate if the size of a firm affects the relationship between debt and cash flow using the following empirical specification:

$$(\text{LEV}/A)_{it} = \beta_0 + \beta_{11} (\text{LEV}/A)_{it-1} * \text{FC}_{it} + \beta_{12} (\text{LEV}/A)_{it-1} * \text{LLFC}_{it} + \beta_{13} (\text{LEV}/A)_{it-1} * \text{NFC}_{it} + \beta_{21} (\text{Cash Flow}/A)_{it} * \text{FC}_{it} + \beta_{22} (\text{Cash Flow}/A)_{it} * \text{LLFC}_{it} + \beta_{23} (\text{Cash Flow}/A)_{it} * \text{NFC}_{it} + \beta_3 (\text{Log Sales})_{it} + \beta_4 (\text{Sales Growth})_{it} + \beta_5 (\text{Structure})_{it} + \beta_6 (\text{Tax})_{it} + v_i + v_t + \varepsilon_{it} \quad (3)$$

where the variables are as defined previously but the cash flow variable is interacted in turn with the dummy variables FC_{it} , LLFC_{it} and NFC_{it} ⁵. These dummies are used in the leverage regressions as interactions on the cash flow term to control for access to external finance. The reason for doing this is that we want to investigate what happens to the relationship between debt and cash flow at SMEs when we take into account firms' access to external finance. To check for the robustness of the results obtained we also use a measure of riskiness to separate the firms. The results when we consider overall financial constraints are given in Table 4. The negative relationship between debt and cash flow still holds when we take into account the ease or

⁵ *FC* firms have their real assets in the bottom quartile of the distribution of all real assets while *LLFC* firms have their real assets in the middle quartile of the distribution of all real assets, finally *NFC* firms have their real assets in the top quartile of the distribution of all real assets, all classified by industry and by year.

difficulty with which firms get access to external financing. The coefficients obtained on the *FC*, *LLFC* and *NFC* dummies are -0.274, -0.301 and -0.393 respectively that indicate that overall constraints do not really influence the negative relationship between leverage and cash flow. However, when we look at the magnitude of the coefficients it seems that firms that get the easiest access to external finance are the most debt-conservative firms. This can be explained by the fact that many large firms in the real world operate with very low levels of leverage while some do not have any leverage at all.

The fact that a firm can borrow does not seem to affect the negative relationship between debt and cash flow. The result makes sense if we consider that the major factor that affects whether or not a firm takes debt is the ability of the firm to service debt, which in turn depends on the cash flows of the firm, that is, its internal financial constraints. Therefore it is not surprising that the size of firms; overall financial constraints, do not seem to affect the relationship between debt and cash flow. Therefore, SMEs avoid taking debt in their capital structure. This result seems to suggest that firms have an inherent characteristic that makes them avoid debt. It also suggests that internal constraints are much more relevant and they influence overall constraints.

Table 4: Regression Results: Accounting for Overall Constraints

	(REAL ASSETS) (1)	ROBUSTNESS CHECKS (Quiscore) (2)
$(LEV/A)_{it-1} * FC_{it}$	0.397*** (0.077)	
$(LEV/A)_{it-1} * LLFC_{it}$	0.386*** (0.044)	
$(LEV/A)_{it-1} * NFC_{it}$	0.459*** (0.052)	
$(LEV/A)_{it-1} * RISKY_{it}$		0.401*** (0.088)
$(LEV/A)_{it-1} * SAFE_{it}$		0.399*** (0.040)
$(LEV/A)_{it-1} * SECURE_{it}$		0.541*** (0.100)
$(Cash\ Flow/A)_{it} * FC_{it}$	-0.274** (0.108)	
$(Cash\ Flow/A)_{it} * RISKY_{it}$		-0.568** (0.314)
$(Cash\ Flow/A)_{it} * LLFC_{it}$	-0.301*** (0.069)	
$(Cash\ Flow/A)_{it} * SAFE_{it}$		-0.347*** (0.067)
$(Cash\ Flow/A)_{it} * NFC_{it}$	-0.393*** (0.087)	
$(Cash\ Flow/A)_{it} * SECURE_{it}$		-0.652*** (0.134)
$(Log\ Sales)_{it}$	-0.081*** (0.023)	-0.065*** (0.020)
$(Sales\ Growth)_{it}$	-0.005 (0.013)	-0.012 (0.013)
$(Structure)_{it}$	0.078 (0.078)	0.055 (0.079)
$(Tax)_{it}$	0.015 (0.013)	0.006 (0.013)
Sample size	14955	14927
m2	0.323	0.334
J(p-value)	0.574	0.933

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

The J statistic is a test of the over identifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used in column 1 are $(LEV/A)_{it-1} * FC_{it}$, $(LEV/A)_{it-1} * LLFC_{it}$, $(LEV/A)_{it-1} * NFC_{it}$, $(CF/A)_{it} * FC_{it}$, $(CF/A)_{it} * LLFC_{it}$, $(CF/A)_{it} * NFC_{it}$, $(Log\ Sales)_{it}$, $(SalesG)_{it}$, $(STRUC)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Instruments used in column 2 are $(LEV/A)_{it-1} * RISKY_{it}$, $(LEV/A)_{it-1} * SAFE_{it}$, $(LEV/A)_{it-1} * SECURE_{it}$, $(CF/A)_{it} * RISKY_{it}$, $(CF/A)_{it} * SAFE_{it}$, $(CF/A)_{it} * SECURE_{it}$, $(Log\ Sales)_{it}$, $(SalesG)_{it}$, $(Structure)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Time dummies are included in all specifications as repressors and instruments. Also, see notes to Tables 1 and 2. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

5. Conclusion

We examine the relationship between firm leverage and cash flow at SMEs in the UK since these are the two most important sources of finance of most firms. Our results suggest that the relationship between debt and cash flow can be better explained by the POT. Cash flow is a vital source of financing of SMEs and they seem to follow a financial hierarchy when deciding what sources of finance to use. If firms experience an increase in cash flow, they tend to reduce the amount of debt they hold, possibly by paying off debt but if cash flow falls firms increase leverage in their capital structure. We further investigate this negative relationship by taking into account internal financial constraints and overall financial constraints. We find that internal financial constraints are the main factors that influence the amount of debt that a firm has in its capital structure. Even if firms have negative cash flows, they do not increase their leverage, although these firms are likely to be more debt dependent. The results obtained when firms are distinguished according to the level of overall financial constraints, seem to suggest that however large a firm might be and however easy it is for a firm to have access to debt, firms inherently do not like to increase debt in their capital structure. The crux of the problem is then whether managers want to go for external financing. Our results seem to indicate that SMEs in the UK are financially conservative. They prefer to pay back debt when they experience an increase in their cash flows rather than borrowing more say to invest and they prefer to have less debt when they have negative or low cash flows, possibly to avoid the risk of bankruptcy. All of this implies a major reliance of firms, especially unquoted ones, on cash flow. Hence, these firms might be constricting their performance according to their cash flows. This has important implications on growth as it suggests that if these firms had been less debt averse (both when cash flows are negative or positive) perhaps they could grow more.

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