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# Building financial flexibility in preparation for Brexit: the case of Irish medium sized enterprises

**Research Article**

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**Abstract:** The purpose of this paper is to examine the building of financial flexibility by Irish medium sized enterprises in the run-up to Brexit. We analyze changes in firms' dividends, leverage, cash, investment levels and working capital in the period surrounding the passing of the Brexit referendum to test for stockpiling of financial slack. Whilst we find no evidence of financial flexibility building overall, there is some evidence to suggest that firms incentivised to build such flexibility do so. Cash poor firms appear to build financial slack by way of reducing leverage and increasing their cash reserves. In contrast, cash rich firms increase their capital expenditure using internal and external funds. Interestingly all firms irrespective of their size or financial strength increase their working capital investment and in particular build their inventory levels post the Brexit referendum. Our evidence suggests Irish medium sized enterprises are optimistic of the opportunities post Brexit.

**Keywords:** *Brexit; Irish medium sized enterprises; financial flexibility*

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## INTRODUCTION

Financial flexibility is associated with firms untapped borrowing power (Modigliani and Miller, 1963), and the stockpiling of financial slack i.e., cash reserves and spare debt capacity (Minton and Wruck, 2001). Such flexibility enables firms to respond effectively to unanticipated shocks to their cash flows and investment opportunities (Bancel and Mittoo, 2011, Byoun 2011) thereby avoiding underinvestment as well as financial distress (Bonime et al., 2013). More recently Choi et al. (2021) denotes financial flexibility as the absence of financial constraints. Management's desire for "financial flexibility" is one of the most important factors 'affecting corporate debt decisions (Graham and Harvey (2001, pp.218). Firms ability to adjust their financing to respond to shocks to their liquidity and investment opportunities has attracted more attention of late (Chortareas and Noikokyris, 2021). Much of the research on financial flexibility focuses on its value for listed and unlisted companies during/after recessions/crisis periods (Ang and Smedema, 2011; Bancel and Mittoo, 2011; Rapp et al., 2014 Fahlenbrach et al., 2021). Financial flexibility is of particular importance for smaller firms (Martinez-Sola et al., 2018) but few studies capture this despite the likelihood that they are more likely to suffer financial constraints (Vermoesen et al, 2013).

The passing of the Brexit referendum in the summer of 2016 introduced much political, economic, and diplomatic uncertainty for Irish firms, and small to medium sized Irish enterprises, in particular (Belke and Ptok, 2018; Hassan et al., 2020). Brexit was viewed as different from a typical uncertainty shock because of its length, breadth, and political complexity (Bloom et al., 2018) but a very important one for Ireland, a small open economy with the United Kingdom (hereafter UK) an integral trading partner accounting for 13% of exports and 25% of imports (Lawless, 2020). Indeed, the strong interwoven affiliations between Ireland and the UK positions Ireland uniquely in its exposure to the impact of Brexit (Copenhagen Economics, 2018; Hassan et al., 2020) and as such, it is expected that changes

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to the Ireland-UK trading partnership could negatively impinge on Irish economic performance (Lawless, 2020). Moreover, medium sized firms account for a significant share of exports in Ireland (over €22 million or 19% of total exports) (Houses of the Oireachtas, 2019) and thus represent an important cohort of firms to consider in the context of Brexit.

In this paper, we examine whether Irish firms used the period following the June 2016 referendum confirming the UK's departure from the European Union to prepare for Brexit. Much has been written since 2016 advising Irish firms how best to prepare for Brexit e.g., diversify across product lines and identify new export markets; importers should identify new suppliers and/or negotiate terms with existing UK suppliers to name but a few. Our particular focus is on financial flexibility, and in this paper, we examine whether Irish firms have used the period since 2016 to build financial flexibility/resilience to better prepare themselves to manage the uncertainties associated with Brexit. If we define financial flexibility as the stockpiling of financial slack (i.e., cash reserves and spare debt capacity), then there are many options open to firms to build financial flexibility. We examine whether Irish firms have used each of dividend policy (e.g., firms may cut dividends to build cash reserves); leverage policy (firms may reduce pre-Brexit debt levels to build spare debt capacity); investment (e.g., firms may reduce or delay investment spend given the uncertainties of Brexit); and working capital (e.g., firms may attempt to speed up the receipt of cash and reduce the length of their cash cycle), to build financial flexibility in a six-year period surrounding the passing of the Brexit referendum.

Overall whilst we find no evidence of financial flexibility building in the main sample, we do find however that firms with greater incentives to build such flexibility do so as cash poor and highly leveraged firms increase their cash reserves and reduced their debt levels in preparation for Brexit. In contrast cash-rich and less indebted firms invest more which is financed by a combination of their own resources and long-term debt. The assertion is that firms adapt and those more incentivized to build flexibility do so.

This study offers three contributions. Firstly, we build on the existing work on financial flexibility by conducting a comprehensive analysis of such flexibility by measuring changes in each of dividends, leverage, cash, investment levels and working capital within-firms between the pre- and post-Brexit referendum periods. Secondly, by using the context of Brexit, we examine a unique period of uncertainty and an opportune occasion to evaluate an uncertainty whose latitude and longitudinal complexity has not been seen before. We add to the literature on Brexit which has focused on macroeconomic impacts (Bergin et al, 2017), trade flows (Barry et al., 2019, Lawless and Morgenroth, 2019), and on UK SMEs (Brown et al 2019). Finally, by focusing on medium sized firms we address a neglected cohort in the financial flexibility literature and a very important subset of firms in most countries.

The remainder of the paper is as follows: The next section presents the theoretical basis and hypotheses. Subsequently the data and methodological approach are outlined after which the results and discussion is then presented. Finally, the paper concludes.

# THEORY AND HYPOTHESES DEVELOPMENT

Financial flexibility relates to a firm's ability to secure and reconfigure their financing at a lower cost enabling them to fund profitable investment opportunities, thereby avoiding financial distress when faced with negative shocks (Gamba and Triantis, 2008). DeAngelo and DeAngelo (2011) assert financial flexibility as a vital 'missing link for an empirically viable capital structure theory' (Bancel and Mittoo, 2011, p.182). Financial flexibility encapsulates capital structure theories but also theories underpinning cash holdings, and dividend payout which creates an "intertemporal dependence" between financial and investment decisions (Almeida et al., 2011; Denis, 2011; Ferrando et al., 2017). This amalgam of theories makes the measurement of financial flexibility challenging (Bancel and Mittoo, 2011). We examine whether firms seek to build financial flexibility by observing whether they changed one or all of dividends, leverage, cash, and investment in long-lived assets and working capital since the passing of the Brexit referendum in 2016.

## Dividends

Firms' payout policy is a key component of their financial flexibility. Shareholder payouts can serve as a buffer, especially so in crisis times, since funds originally set aside for dividend/repurchase payouts can be reinvested in

the firm (Bonaime et al, 2014). During periods of economic and financial uncertainty, firms do change their dividend policies (Bliss et al, 2015; Attig et al., 2021), with cuts imposed in favour of a more conservative payout approach (Nhan Duong et al., 2020). Bliss et al, (2015) suggest that firms who experienced stringent external financial shocks during the global financial crisis period reduced shareholder payouts and deployed these savings to cash reserves and investment purposes. Private firms have restricted access to external finance resulting in lower dividends than for public firms (Michaely and Roberts, 2011). Also, and unlike publicly-held firms, the curtailment of agency costs is less relevant for closely-held private firms, and because dividend cuts/omissions cannot be met with falls in share prices for private firms, private firms have greater flexibility to decrease their dividend payouts. Hence in attempting to build financial flexibility, we hypothesize the following:

***H1: Irish medium sized enterprises decreased dividend payout in preparation for Brexit***

## Leverage

Financial flexibility is deemed as the critical missing link in an empirically viable capital structure theory with the contention that firms will maintain low long-run leverage targets to enhance their financial flexibility (DeAngelo and DeAngelo, 2007). A conservative leverage policy may assist in building reserves of untapped borrowing power (Modigliani and Miller, 1963). Empirical support for low leverage policy in achieving financial flexibility has been documented by Lins et al. (2010) and Campello et al. (2010). Ferrando et al. (2017) demonstrate that UK SME's use a low-leverage policy to attain financial flexibility.

Debt is a cost-effective source of capital in shock scenarios and firms proactively reduce leverage to maintain their current debt capacity to meet future expected borrowings (Lambrinoudakis et al., 2019). Debt capacity is a scarce resource, and its preservation is particularly important for medium sized enterprises given their restricted access to capital markets (DeAngelo et al 2017). Moreover, higher leverage firms actively reduce their debt to build financial flexibility (DeAngelo et al., 2018). Banks view medium sized firms as riskier during crises (Eggers, 2020) and with Brexit seen as a period of increased uncertainty we hypothesize the following:

***H2a: Irish medium sized enterprises reduced their leverage in preparation for Brexit***

Byoun (2011, 2016) denotes financial flexibility as the capacity of firms to mobilize financial resources to avail of investment opportunities in response to unexpected contingencies. Debt is a funding tool for businesses and firms use it for transitory financing (De Angelo et al., 2018). Medium sized firms are hugely dependent on bank lending (Ferrando et al., 2017) with SMEs in the euro area particularly vulnerable to a deterioration in banking market conditions (Moscalu et al., 2020). Financial constraints are more synonymous in times of crisis (Ferrando and Mulier, 2015). In anticipation of a possible future crisis, medium sized firms may build financial flexibility by increasing their leverage. Hence, we hypothesis the following:

***H2b: Irish medium sized enterprises increased their leverage in preparation for Brexit***

## Cash holdings

Kim et al. (1998) illustrate how firms can achieve financial flexibility by building cash reserves. Such reserves help firms avoid cash shortfalls and avail of growth opportunities (Opler et al; 1999; Alemdia et al, 2004; Gamba and Triantis, 2008; and Riddick and Whited, 2009). The precautionary motive for holding cash sees firms stockpile cash to meet unexpected contingencies and guard against future cash shortfalls thereby avoiding any liquidity constraint (Han and Qiu, 2007; Martinez-Sola et al, 2018). Surplus cash is held as a type of insurance against financial distress while lines of credit are held to finance future growth (Lins et al, 2010; Arslan-Ayaydin et al. 2014). The precautionary motive for building cash reserves is especially relevant for SMEs given their limited options in raising external finance (Berger and Udell, 1998; Gao et al, 2013). Cash holdings are especially valuable for constrained firms unable to source funds when investment opportunities arise or when debt repayments fall due (Almeida et al, 2004; Faulkender and Wang, 2006). This is especially true in the case of smaller firms who are more susceptible to financial constraints (Stiglitz and Weiss, 1981; Beck et al, 2008; Vermoesen et al, 2013; Martinasez-Sola et al., 2018). Costly external financing can be substantial for small firms and cash reserves help especially in challenging times enabling firms to undertake short-term investment opportunities (Gamba and Triantis, 2008). Smaller firms thus have a greater need for financial flexibility and larger cash holdings to cater for future contingencies (Byoun,

2011). During a crisis period, small and medium sized firms are more susceptible to credit rationing and greater external financing costs from a credit supply shock (Martinasez-Sola et al., 2018). Having adequate cash to avoid constraints and curtailing investments is more important in crisis periods (Kahle and Stulz, 2013). Note cash and each of dividends, leverage, investment, and working capital are inextricably linked, since firms can increase their cash piles by reducing each of dividends, investment and working capital investment (e.g., lower inventory spend), and by borrowing more. Hence, we hypothesize:

***H3: Irish medium sized enterprises increased their cash holdings levels in preparation for Brexit***

## Investment levels

The financial flexibility paradigm denotes how new investments are primarily financed with debt (Lambrinoudakis et al., 2019). Financial flexibility enables firms to invest significantly more (Marhica and Mura, 2010). This is particularly true in a crisis era (Arslan-Ayaydin et al., 2014). Greater financial flexibility stemming from a conservative leverage policy in the era prior to the 2007-08 crisis resulted in public and private European companies being able to undertake growth opportunities even against the backdrop of weak macroeconomic conditions, (Ferrando et al., 2017). If external funds are rationed, investment spending depends on the availability of internal finance (Fazzari et al, 1988). Cash holdings are inherently linked to financial flexibility which in turn is important for financing future growth opportunities (La Rocca et al.,2019). To prepare for the uncertainty surrounding Brexit and in building/conserving financial slack our assertion is that firms cut their investment spend. Hence, we hypothesize the following:

***H4: Irish medium sized enterprises decreased their investment levels in preparation for Brexit***

## Working capital

Working capital accounts for the net position of firms' liquid assets and is defined as the sum of accounts receivable and inventories minus accounts payable and other non-financial debts due in less than one year (Nicolas, 2021). Accounts receivable, accounts payable and inventory are the key components of the noncash element of working capital (Mullins and Komisar, 2009). Working capital is an important source of liquidity (Fazzari and Petersen, 1993; Dhole et al., 2019) and the cash conversion cycle (the time it takes to convert working capital into cash) is a key part (Dhole et al., 2019). Management of the cash conversion cycle (CCC) is vital for small firms which can be cash constrained (Belghitar and Khan, 2013).

Trade credit arises when suppliers grant deferred payments to customers to help support sales policies, strengthen customer relationships (Bussoli and Mariono, 2018) and to grow profits (Lee and Stowe, 1993; Deloof and Jegers, 1996; Pike et al, 2005; and Dhole et al., 2019). Most firms extend trade credit (accounts receivable) to their customers as well as availing of it themselves from suppliers (accounts payable). Trade credit is sensitive to cash flows as an important cash substitute as changes in trade credit correlates with changes in cash (Zhang, 2020). Cash levels increase from speeding up collection from accounts receivable and from extending the time to pay accounts payable. Hence to conserve cash and decrease the cash conversion cycle we hypothesize the following:

***H5a: Irish medium sized enterprises decreased their accounts receivable levels in preparation for Brexit***

***H5b: Irish medium sized enterprises increased their accounts payable in preparation for Brexit***

## Inventory

Holding inventory enables firms to better serve their customers and avoid high production costs due to fluctuations in price (Schiff and Lieber, 1974; Dhole et al., 2019). Zeng et al. (2020) assert inventory levels could lessen economic shocks, stabilize production, and provide a response to demand uncertainty. Furthermore, the likelihood of stockouts could be minimized with opportunities for arbitrage considering price variations. In the context of economic uncertainty, Dbouk et al (2020) found macroeconomic uncertainty raises the level of inventory for manufacturing firms such that greater uncertainty of demand increases the volume of safety stock. Thus, we posit the following:

***H5c: Irish medium sized enterprises increased their inventory levels in preparation for Brexit***

Yet greater uncertainty of demand can result in lower inventory, leading to a reduction in its optimal level (Kim and Chung, 1989). Moreover, holding excess inventory may result in cash flow problems due to a longer CCC (Kesavan and Mani, 2013). Hence, we hypothesize the following:

***H5d: Irish medium sized enterprises decreased their inventory levels in preparation for Brexit***

# DATA AND METHODOLOGY

## Data sample

Our primary data source for this study is FAME (Financial Analysis Made Easy). The FAME database covers 3.8 million publicly traded and private limited firms in Ireland and the UK. Our focus is on medium sized Irish firms (defined as firms with more than 49 but less than 250 employees). Small firms (<49 employees) do not satisfy our minimum data requirements (see next paragraph), and thus are excluded from the analysis. We source the initial sample of firms from the FAME database between 2011 and 2019. We exclude firms with missing data, with missing variables, and firms in the utilities and financial/insurance sectors. We choose not to include the year 2020 in our analysis because of the influence of Covid-19 on firms' finances which would be independent of any Brexit effects.

In our analysis we lag each independent variable by one-year (except for firm age), and because we use profit volatility (measured as the standard deviation of return on assets over the previous three years) as an independent variable, we observe our final sample of firms in a six-year period surrounding the passing of the Brexit referendum in 2016 (2014-2019). We focus on within-firm changes in each dependent variable between the pre- and post-Brexit referendum periods. Hence, we require that firms have available data in both sub-periods and require that firms have at least three consecutive firm-year observations. Our panel of firms is unbalanced; the average number of firm-year observations is 5.2 years. The number of firm-year observations is not the same in each regression because FAME data is not uniformly available across variables. The number of firm-year observations varies from a low of 906 observations or 270 firms in the dividend regressions to a high of 1,367 observations or 320 firms where leverage is the dependent variable.

## Key variables

In this study we examine whether Irish medium sized firms increased their level of financial flexibility since the passing of the Brexit Referendum in 2016. We focus on changes in each of (1) cash holdings; (2) leverage; (3) dividend policy; and (4) investment policy. First, we focus on both the level of cash and the cash conversion cycle (hereafter CCC), with the latter capturing the efficiency of the working capital cycle (i.e., the time it takes firms to convert inventory spend into cash from sales). We measure cash as cash to assets. We measure CCC as (days in receivables plus days in inventory less days in payables), which says that firms can improve their cash cycles by reducing each of inventory and receivable days, and by extending payables days. We measure days in receivables as ((accounts receivables/net sales)*365); days in inventory as ((inventory/net sales)*365), and days in payables as ((accounts payable/net sales)*365). We measure working capital as ((current assets – current liabilities)/book assets).

We measure the level of indebtedness in two ways. Following Welch (2011), we use (1) the total liabilities to total assets ratio and, (2) the financial debt to capital ratio, where capital is the sum of financial debt and equity. We do not use the commonly employed book debt ratio, because this ratio includes nonfinancial liabilities (accounts payable) in the denominator. To allow for the possibility that firms may alter the maturity structure of their debt holdings in the lead up to Brexit, we track each firm's debt maturity and measure it as the ratio of long-term financial debt to total financial debt.

We study each of the dividend propensity and the dividend amount in the lead up to Brexit. We measure the dividend propensity using a dividend payer variable which equals one if a firms pays a dividend in year t and is zero otherwise. We scale dividends by sales to measure dividend amounts. We refrain from scaling dividends by earnings as negative earnings make the dividend payout measure meaningless (and unusable) and its use would

only serve to further reduce our sample size. We explore the possibility that firms may attempt to build financial flexibility by reducing their investment spend in the run up to Brexit by measuring the investment level of firms using the ratio of capital expenditures to book assets.

Our independent variables include a range of measures shown in the extant literature to influence each of (1) dividends (Fama and French, 2001; Von Eije and Megginson, 2008); (2) leverage (Frank and Goyal, 2009; Fan et al., 2012); (3) cash (Faff et al., 2016; Graham and Leary, 2018); (4) investments (Faff et al., 2016); and (5) working capital (Chen and Kieschnick, 2018; Hasan and Habib, 2018). We control for firm size; firm growth; profitability; profit volatility (in dividends, cash, and working capital regressions); cash (in dividend and investment regressions only); total liabilities (in each of dividend and working capital regressions only); the log of firm age in all regressions to control for lifecycle effects; asset tangibility (in leverage regressions only); working capital (in cash regressions and the change in working capital is included in investment regressions); dividend payout (in cash regressions only); and financing constraints (in cash and working capital regressions). Details on how we construct each independent variable is outlined in Table 1.

## Empirical model

In this study we focus on identifying within-firm changes in financial flexibility which may have occurred in the run up to Brexit. To this end we estimate a series of firm fixed-effects regressions as follows:

$$y_{it} = \alpha + \beta_1 post - Referendum_t + Controls_{it} + \alpha_1 GDP\ per\ capita_t + \mu_i + \varepsilon_{it} \quad (1)$$

Where $y_{it}$ is each of dividends, leverage, cash, investment, and each working capital variable (accounts receivable, accounts payable, inventory, and the cash conversion cycle), as indicated in Tables 2 and 3. The independent variable of primary interest is "post-Referendum"; a dummy variable which equals 1 in each of years 2017 (one-year after the Brexit Referendum), 2018 (two years after), and 2019 (three-years after). The reference period for each post-Brexit referendum year dummy variable is the immediate three-year period (2014-2016) prior to the Brexit referendum in June of 2016. Note we choose to designate 2016 as a pre-Referendum year. $\beta_1$ captures the within-firm change in $y_{it}$ between the pre- and post-Referendum periods. For example, if firms choose to reduce their dividend payouts in preparation for Brexit, then $\beta_1$ will be negative. Controls is a set of firm-level controls, discussed in the previous section, and with except of firm age, are lagged by one-year. In each regression, we control for the influence of general economic conditions with the inclusion of the log of GDP per capita. The standard errors are adjusted for clustering at the firm-level (Petersen, 2009).

# RESULTS

## Summary statistics

Summary statistics for the full sample of firms are presented in the top panel of Table 1. The number of firms that pay a dividend is high with dividends present in 48% of firm-years. Dividend amounts are large, averaging 3% of sales. Interestingly, dividends paid by publicly traded Irish firms are lower (relative to sales), yet publicly traded Irish firms are more likely to pay a dividend. For example, Brockman and Unlu (2009) report that over the period 1990-2006, 81.55% of Irish public firms paid a dividend and the dividend amounted to 1.43% of sales on average. Shao et al. (2013) report average dividends to sales of 1.33% for publicly traded Irish firms over the 1991-2010 period. The average firm is profitable (EBIT to assets is 0.09), growing according to sales growth (sales growth is 0.08 or 8%), but not asset-growth ((0.06)). With a score of (2.75), the Hadlock-Pierse "size-age" index of financing constraints says that the average firm in our sample is not financially-constrained. In support of the view that the average firm in our sample is not financially-constrained, we observe that these firms possess large cash reserves (19% of assets), and do not appear overly-indebted (financial debt to capital is just 21%); Cleary (2005) asserts that financially unconstrained firms are abundant in cash and possess spare debt capacity. Note also that the firms in our sample predominately use short-term debt; the ratio of long-term financial debt to total financial debt is 0.28. In the bottom rows of Table 1 we characterize the average firm in each of ten industry groupings based on each firms four-digit primary SIC. According to the Central Statistics Office of Ireland, the population of small to medium sized enterprises are predominantly service sector firms. Our sample of firms is dominated by service sector firms (441 firms), followed by firms in manufacturing (316 firms), and retail trade (192).

**Table 1:** Variable description

| Variable | Description | Mean | p25 | Median | p75 | p95 | Stdev |
|---|---|---|---|---|---|---|---|
| **Financial flexibility variables** | | | | | | | |
| Dividends-sales | Dividends paid to common shareholders to sales | 0.03 | 0.00 | 0.00 | 0.01 | 0.15 | 0.08 |
| Dividend payer | Equals 1 if the firm pays a dividend in year t | 0.48 | 0.00 | 0.00 | 1.00 | 1.00 | 0.50 |
| Working capital | (Current assets - current liabilities) to book assets | 0.29 | 0.10 | 0.31 | 0.47 | 0.70 | 0.26 |
| Inventory days | (Inventory/net sales) * 365 | 21.58 | 0.00 | 7.21 | 34.76 | 84.84 | 29.76 |
| Receivables days | (Accounts receivable/net sales) * 365 | 32.30 | 0.00 | 10.51 | 59.59 | 99.31 | 43.38 |
| Payables days | (Accounts payable/net sales) * 365 | 23.58 | 0.00 | 16.02 | 36.15 | 71.62 | 33.72 |
| Cash conversion cycle | Days in receivables + days in inventory - days in payables | 31.25 | 0.00 | 15.31 | 60.65 | 113.98 | 47.81 |
| Cash holdings | Cash to assets | 0.19 | 0.06 | 0.15 | 0.27 | 0.55 | 0.17 |
| Total liabilities | Total liabilities to book assets | 0.45 | 0.26 | 0.44 | 0.63 | 0.83 | 0.23 |
| Financial debt to capital | Financial debt to sum of financial debt and equity | 0.21 | 0.01 | 0.12 | 0.34 | 0.71 | 0.24 |
| Debt maturity | Long-term financial debt to total financial debt | 0.28 | 0.00 | 0.02 | 0.62 | 0.92 | 0.35 |
| Investment | Capital expenditures to book assets | 0.04 | 0.01 | 0.02 | 0.06 | 0.16 | 0.07 |
| **Control variables** | | | | | | | |
| Asset tangibility | Fixed to total assets | 0.36 | 0.13 | 0.30 | 0.53 | 0.89 | 0.27 |
| Firm age | Year less establishment year | 31.40 | 18.00 | 28.00 | 40.00 | 65.00 | 19.82 |
| Firm size | Log of book assets in thousands of euro | 2.50 | 1.97 | 2.51 | 3.06 | 4.02 | 0.83 |
| Profitability | Earnings before interest and taxation to book assets | 0.09 | 0.03 | 0.07 | 0.13 | 0.33 | 0.13 |
| Profit volatility | Standard deviation of ROA over the previous three years | 0.06 | 0.01 | 0.03 | 0.06 | 0.21 | 0.08 |
| Sales growth | One-year growth in sales | 0.08 | (0.01) | 0.06 | 0.15 | 0.44 | 0.21 |
| Asset growth | One-year growth in book assets | (0.06) | (0.13) | (0.05) | 0.01 | 0.22 | 0.19 |
| Financing constraints | HP index equals (-0.737 * size + 0.043 * size2 -0.040 * age) | (2.75) | (3.31) | (2.75) | (2.15) | (1.50) | 0.82 |
| Δ Working capital | Change in working capital to lagged book assets | 0.32 | 0.10 | 0.32 | 0.51 | 0.79 | 0.29 |
| Foreign sales | The ratio of foreign to total sales | 0.07 | 0.00 | 0.00 | 0.00 | 0.71 | 0.22 |
| GDP per capita | Natural log of GDP per capita in constant euro prices | 10.92 | 10.72 | 10.96 | 11.02 | 11.09 | 0.15 |
| Referendum dummy | Equals 1 in years 2017, 2018, and 2019, 0 otherwise | nm | nm | nm | nm | nm | nm |
| Industry dummies | Industry dummies based on US four-digit primary SIC | nm | nm | nm | nm | nm | nm |

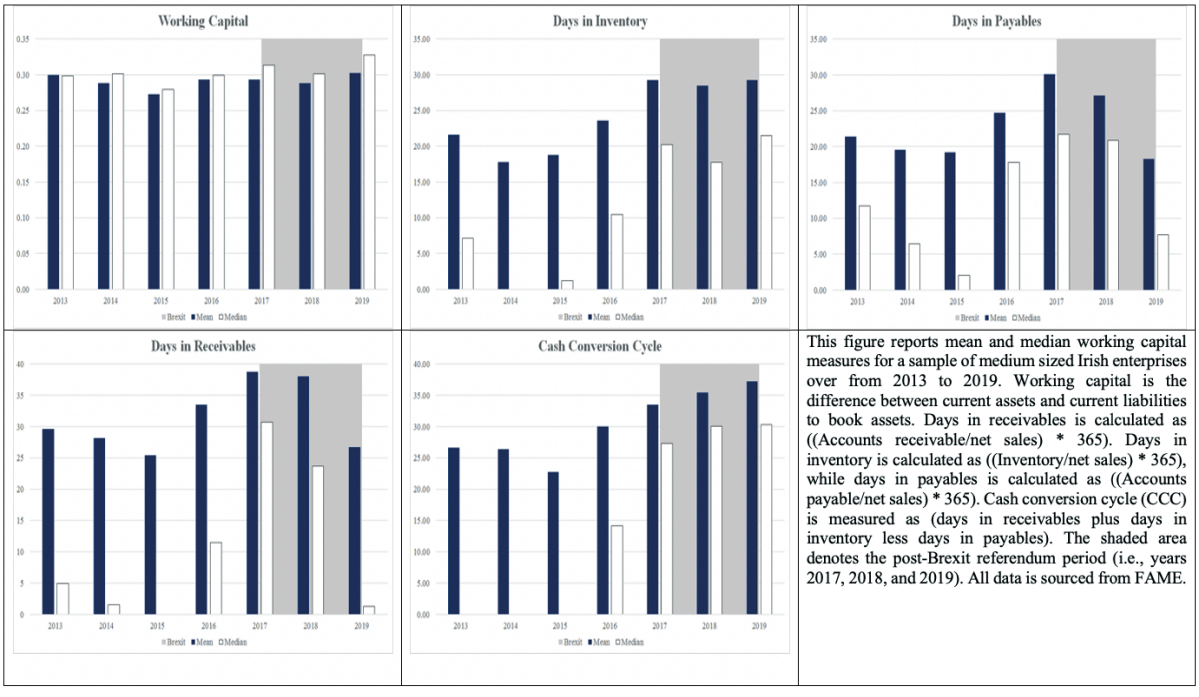
| **Number of firms in each industry** | | | | |
|---|---|---|---|---|
| Agriculture, Forestry & Fishing | Mining | Construction | Manufacturing | Transportation, Communications, Electric, Gas & Sanitary |
| 10 | 7 | 129 | 316 | 106 |
| Wholesale trade | Retail trade | Services | Public administration | Other |
| 142 | 193 | 441 | 3 | 26 |

## Empirical results

Tables 2 and 3 present estimated coefficients from a series of firm fixed-effects regressions. The dependent variable in Table 2 is dividend-payer (Div-payer); dividends to sales (Div-sales); total liabilities to total assets (TL/TA); financial debt to capital (FD/CAP); debt maturity; cash, and investment, as indicated. Our focus in Table 3 is on working capital practices, where the dependent variables are each of working capital; inventory days; receivables days; payables days; and the cash conversion cycle, as indicated. As a precursor to the main analysis, first consider Figures 1, 2, and 3, which present mean and median working capital (Figure 1), leverage and cash (Figure 2), and dividend payout and capital expenditures (Figure 3) over the period 2013-2019. Figure 1 says that while investment in working capital appears quite stable over the sample period, CCC days is at its highest after the Brexit referendum (post 2016). The increase in CCC days is driven by sizable increases in each of days in receivables and days in inventory. But for concurrent increases in days in payables, CCC days would have been even higher. Increases in each of inventory and payables is consistent with firms preparing for Brexit, but not so the increase in receivables that we observe. Figure 2 shows how cash levels remained largely the same over the sample period. Firms use of financial debt declined in 2017 but appears to level-off thereafter (at least for the median firm), while firms have continued to use less long-term debt throughout the sample period. There is little evidence that firms have used either dividend payouts and/or capital expenditures to build financial flexibility; Figure 3 illustrates how neither dividend amounts, nor capital expenditures are lower post-Brexit Referendum.

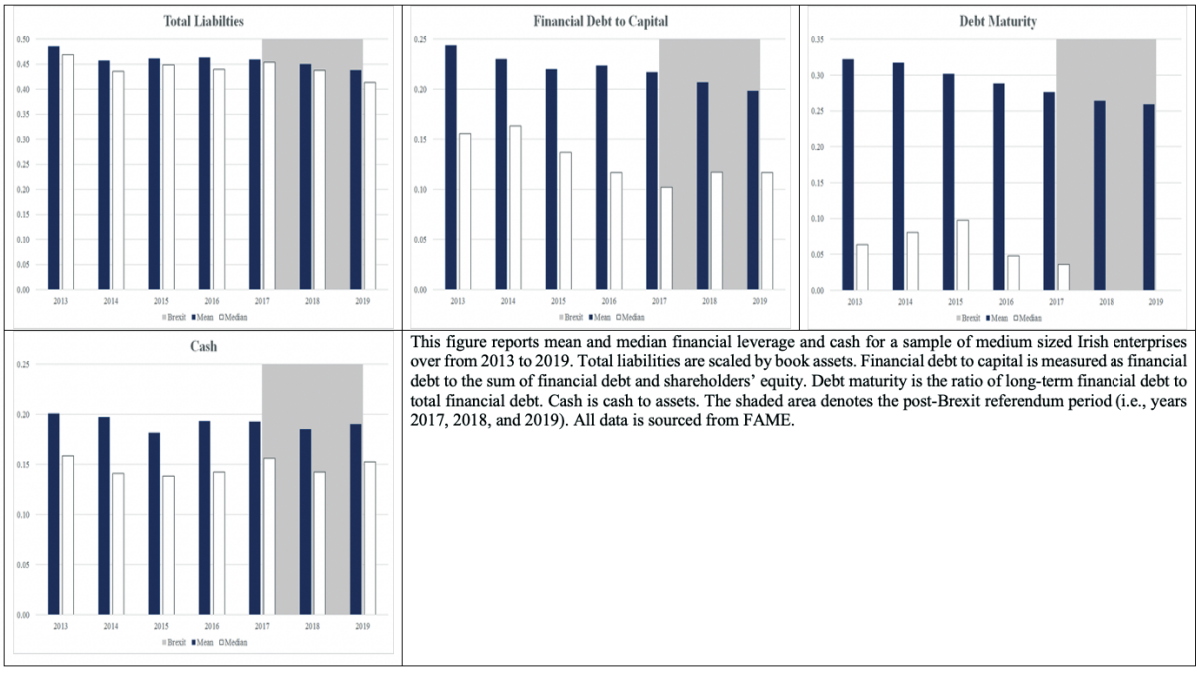
We begin with Table 2. Here the estimated coefficients do not lend support to each of hypotheses 1, 2a, 2b, 3 and 4. Contrary to hypothesis 1, which predicts that firms reduce dividend payouts in the lead up to Brexit, what we observe is the number of dividend paying firms remains the same, while dividend payouts (amounts) almost doubled for the average firm (1.5% to 2.8% of sales). Turning to each of leverage and cash, we find no evidence to support hypotheses 2a, 2b, or 3; there is no evidence to suggest that firms built financial flexibility by changing debt levels and/or increasing cash; debt and cash levels remain unaltered in the post-Brexit referendum period. The estimated coefficients also refute hypothesis 4; investment levels remain the same post-Brexit referendum.

We turn next to Table 3 and observe increases in each of inventory days, receivable days, and payable days. We observe no statistically significant change in the cash cycle which suggest that the increase is payables days was sufficiently large to offset the increases in each of inventory days and receivables days. The increase in each of inventory days and payables days are consistent with firms preparing for Brexit and support each of hypotheses



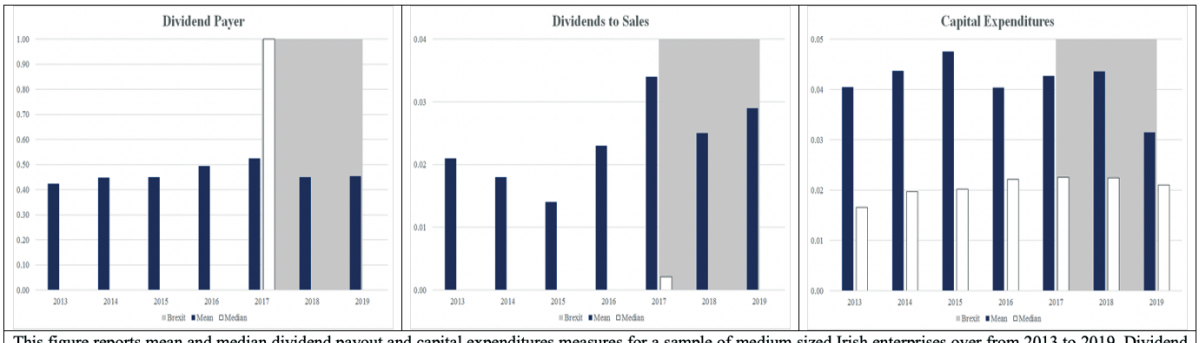

This figure reports mean and median working capital measures for a sample of medium sized Irish enterprises over from 2013 to 2019. Working capital is the difference between current assets and current liabilities to book assets. Days in receivables is calculated as ((Accounts receivable/net sales) * 365). Days in inventory is calculated as ((Inventory/net sales) * 365), while days in payables is calculated as ((Accounts payable/net sales) * 365). Cash conversion cycle (CCC) is measured as (days in receivables plus days in inventory less days in payables). The shaded area denotes the post-Brexit referendum period (i.e., years 2017, 2018, and 2019). All data is sourced from FAME.

**Figure 1:** Working capital




This figure reports mean and median financial leverage and cash for a sample of medium sized Irish enterprises over from 2013 to 2019. Total liabilities are scaled by book assets. Financial debt to capital is measured as financial debt to the sum of financial debt and shareholders' equity. Debt maturity is the ratio of long-term financial debt to total financial debt. Cash is cash to assets. The shaded area denotes the post-Brexit referendum period (i.e., years 2017, 2018, and 2019). All data is sourced from FAME.

**Figure 2:** Financial leverage and cash




This figure reports mean and median dividend payout and capital expenditures measures for a sample of medium sized Irish enterprises over from 2013 to 2019. Dividend payer denotes the proportion of dividend-paying firms annually. Dividends to sales is common dividends scaled by sales. Capital expenditures is capital expenditures to book assets. The shaded area denotes the post-Brexit referendum period (i.e., years 2017, 2018, and 2019). All data is sourced from FAME.

**Figure 3:** Dividend payout and capital expenditures

5c and 5b, respectively. Not so the increase in receivables. The increases in each of inventory days, receivable days, and payable days are large and economically significant. Inventory days increased by 3.85 days (i.e., from 23.22 days pre-Referendum to 27.07 days post-Referendum or 16.58% overall) or 17.84% of average inventory days. Receivables days increased by 4.61 days or 13.51%, and payables days increased by 4.83 days or 19.25%. The increase in each of receivables and payables are noteworthy; they suggest that post-Referendum the average medium sized Irish firm was happy to simultaneously extend more favorable trading terms to their customers (some of which may be other firms) and receive more favorable terms from their suppliers, respectively. Investment in working capital remains the same post-Referendum.

In Tables 4 and 5 we repeat the analysis from Tables 2 and 3 once again, but now for firms with above- and below-median pre-Brexit levels of each of cash and leverage, respectively. A priori, we conjecture that if Irish firms did build financial flexibility in the run-up to Brexit, then we might expect to observe this behavior in firms with low cash and/or high leverage levels pre-Referendum. In Table 3 we observed an increase in accounts receivable; in Table 4 we examine whether cash-poor firms were the beneficiaries (with increased accounts payables) from

**Table 2:** Dividend payout, capital structure, cash, and investment regressions

| | Dependent variable is | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dividend policy | | Leverage policy | | | Cash | Investment |
| | Div-payer | Div-sales | TL/TA | FD/CAP | Debt maturity | | |
| Post-Referendum | 0.002<br>(0.06) | 0.013*<br>(1.72) | -0.010<br>(1.27) | -0.011<br>(1.20) | -0.020<br>(1.42) | -0.000<br>(0.06) | 0.010<br>(1.57) |
| Log firm size | -0.130<br>(1.15) | -0.020<br>(1.29) | -0.004<br>(0.14) | 0.048<br>(1.34) | 0.079*<br>(1.87) | 0.056<br>(0.82) | -0.005<br>(0.30) |
| Firm growth | 0.276**<br>(2.54) | 0.113***<br>(3.80) | -0.055*<br>(1.71) | -0.093**<br>(2.29) | -0.180***<br>(3.89) | 0.039<br>(1.49) | -0.093***<br>(3.52) |
| Profitability | -0.260<br>(1.30) | -0.047<br>(1.19) | -0.203***<br>(3.92) | -0.172***<br>(2.83) | -0.088<br>(1.20) | 0.082<br>(1.58) | -0.073*<br>(1.74) |
| Profit volatility | -0.011<br>(0.04) | -0.015<br>(0.16) | | | | 0.061<br>(0.81) | |
| Cash | -0.007<br>(0.03) | 0.038<br>(1.10) | | | | | 0.147***<br>(3.81) |
| Log firm age | -0.263<br>(0.82) | -0.045<br>(1.36) | 0.017<br>(0.45) | 0.004<br>(0.10) | -0.096<br>(1.49) | 0.099*<br>(1.74) | -0.098<br>(1.55) |
| Total liabilities | -0.611**<br>(2.39) | -0.185***<br>(4.29) | | | | | |
| Tangibility | | | 0.036<br>(0.65) | 0.095<br>(1.61) | 0.202**<br>(1.96) | | |
| Working capital | | | | | | 0.158***<br>(4.22) | |
| Dividend payout | | | | | | -0.046<br>(1.14) | |
| Financing constraints | | | | | | 0.154<br>(1.32) | |
| Δ Working capital | | | | | | 0.158***<br>(4.22) | 0.059**<br>(2.48) |
| Log of GDP per capita | -0.019<br>(0.11) | -0.022<br>(1.06) | -0.056**<br>(1.96) | -0.055*<br>(1.68) | -0.059<br>(1.02) | 0.003<br>(0.08) | 0.025<br>(0.97) |
| Observations | 990 | 906 | 1,026 | 1,367 | 1,367 | 1,306 | 1,018 |
| R-squared (overall) | 0.004 | 0.039 | 0.005 | 0.034 | 0.087 | 0.155 | 0.010 |
| R-squared (within) | 0.027 | 0.136 | 0.088 | 0.052 | 0.049 | 0.065 | 0.146 |
| | **Predicted amounts in the pre- and post-Referendum periods** | | | | | | |
| Pre-Referendum | 0.051 | 0.015 | 0.45 | 0.22 | 0.30 | 0.186 | 0.033 |
| Post-Referendum | 0.051 | 0.028* | 0.44 | 0.21 | 0.28 | 0.186 | 0.043 |

This table presents coefficient estimates from a series of firm fixed effects regressions for a sample of medium sized enterprises in Ireland. The sample period is 2014-2019. The dependent variable is dividend payer (Div-payer), dividends-to-sales (Div-sales), total liabilities to book assets (TL/TA), financial debt to capital (FD/CAP), debt maturity, cash, and investment, as indicated. Post-Referendum is a dummy variable which equals 1 in years 2017, 2018, and 2019. All other variables are defined in Table 1. The bottom rows present predicted amounts of each dependent variable for the average firm in the pre- and post-Referendum periods.
***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

**Table 3:** Working capital regressions

| | Dependent variable is | | | | |
|---|---|---|---|---|---|
| | **Working capital** | **Inventory days** | **Receivables days** | **Payables days** | **Cash cycle** |
| Post-Referendum | 0.006 | 3.844*** | 4.611** | 4.827*** | 3.860 |
| | (0.57) | (2.72) | (2.43) | (2.84) | (1.64) |
| Log firm size | 0.114 | -9.461 | -17.170 | -12.648 | -13.313 |
| | (0.97) | (0.76) | (0.97) | (0.77) | (0.55) |
| Firm growth | 0.032 | -8.647** | -13.271** | -14.900*** | -7.927 |
| | (0.68) | (2.22) | (2.54) | (3.58) | (1.21) |
| Profitability | 0.161** | 7.162 | 16.037 | 5.311 | 17.638 |
| | (2.23) | (1.01) | (1.29) | (0.65) | (1.39) |
| Profit volatility | 0.190 | 2.272 | 4.781 | -10.945 | 18.331 |
| | (1.46) | (0.18) | (0.29) | (0.97) | (0.86) |
| Log firm age | -0.004 | -26.232 | -42.590*** | -35.501** | -33.884 |
| | (0.06) | (1.56) | (2.98) | (1.99) | (1.62) |
| Total liabilities | -0.370*** | -9.209 | 3.432 | -4.699 | 0.196 |
| | (4.79) | (1.27) | (0.32) | (0.62) | (0.02) |
| Financing constraints | 0.096 | -23.075 | -60.299* | -34.462 | -48.702 |
| | (0.48) | (1.01) | (1.87) | (1.07) | (1.08) |
| Log of GDP per capita | 0.005 | 17.307** | 12.784 | 16.191 | 14.266 |
| | (0.08) | (2.51) | (1.14) | (1.51) | (0.98) |
| Observations | 996 | 996 | 996 | 996 | 996 |
| R-squared (overall) | 0.185 | 0.027 | 0.050 | 0.039 | 0.098 |
| R-squared (within) | 0.146 | 0.101 | 0.128 | 0.145 | 0.079 |
| | **Predicted amounts in the pre- and post-Referendum periods** | | | | |
| Pre-Referendum | 0.26 | 23.22 | 34.12 | 25.09 | 32.15 |
| Post-Referendum | 0.26 | 27.07*** | 38.73** | 29.92*** | 36.01 |

This table presents coefficient estimates from a series of firm fixed effects regressions for a sample of medium sized enterprises in Ireland. The sample period is 2014-2019. The dependent variable is working capital, inventory days, receivables days, payables days, and cash conversion cycle, as indicated. Post-Referendum is a dummy variable which equals 1 in years 2017, 2018, and 2019. All other variables are defined in Table 1. The bottom rows present predicted amounts of each dependent variable for the average firm in the pre- and post-Referendum periods.
***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

cash-rich firms (with increased accounts receivables). In Table 6 we explore the possibility that firm size may have influenced firms desire to build financial flexibility and replicate the analysis from Tables 2 and 3 but now for firms defined by pre-Brexit levels of firm size. Hill et al. (2019) construct “Brexit betas” to capture the Brexit exposures of UK listed firms; Brexit exposure is greatest for high growth opportunity firms, and large firms, while firm profitability and foreign sales moderate the potential adverse effects of Brexit. In Table 7 we examine whether foreign sales influenced how medium sized Irish firms reacted to the passing of the Brexit referendum.

Table 4 does suggest that pre-Referendum cash levels influenced how firms responded to the passing of the Brexit referendum. Cash-poor firms responded by building financial flexibility; they increased their debt capacity by reducing their long-term debt holdings and increasing their cash pile. The bottom panel of Table 4 shows that the increases in each of inventory and payables days which we first observed in Table 3 are now evident among cash-poor firms only. This result lends itself to the substitution hypothesis in which Petersen and Rajan (1997) state debt finance and trade credit can act as substitutes. Cash-rich firms, likely without the need to build financial flexibility, were able to invest more, which was financed using a combination of internal funds (cash falls post-referendum) and external funds (leverage increased). There is evidence that cash-rich firms act as providers of financial flexibility for cash-poor firms by way of extended credit suggesting support for the redistribution hypothesis of trade credit of

Meltzer (1960). This redistributive role of trade credit suggests inter-firm liquidity redistribution which stems from a transfer of credit from more liquid to less liquid firms which can be pronounced around the time of a crisis. We also observe an increase in receivables days whilst the dividend policies of both set of firms do not change since 2016.

In Table 5 we examine whether firms' response to the Brexit Referendum was influenced by pre-Referendum debt levels. The analysis presented in Table 5 suggest that they were. Highly-indebted firms responded by (1) reducing their debt levels and (2) accumulating cash. In contrast, low-leverage firms increased their debt holdings while maintaining their cash reserves to pre-Referendum levels. Increases in inventory days are evident for both sets of firms but are much larger for low-leverage firms; for low-leverage firms, inventory days increased by 7.835 days. For high-leverage firms the increase in inventory days is modest at just 1.5 days (i.e., 7.835 days less 6.385 days). The cash conversion cycle increased by just over 10 days for low-leverage firms with an increase in inventory and receivables days.

The analysis presented in Table 6 says that small and large firms responded differently to the passing of the Brexit referendum. Since 2016, small firms increased each of inventory days (9.331 days), receivables days (10.047 days), and payables days (12.555 days), resulting in an overall increase in their CCC (6.712 days). Large firms increase inventory days by 0.525 days (i.e., 9.331 less 8.806 days) and receivables days by 0.437 days (i.e., 10.047 days less 9.610 days), and decrease payables days by 0.318 days (i.e., 12.555 days less 12.873 days), yet the

**Table 4:** Regressions by pre-Referendum cash levels

| | Dependent variable is | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dividend policy | | Capital structure | | | Cash | Investment |
| | Div-payer | Div-sales | TL/TA | FD/CAP | Debt maturity | | |
| Post-Referendum | -0.035<br>(0.75) | 0.012<br>(1.62) | -0.025**<br>(2.43) | -0.033**<br>(2.26) | -0.055***<br>(2.78) | 0.028***<br>(3.21) | -0.002<br>(0.35) |
| Post-Referendum * cash | 0.099<br>(1.44) | 0.003<br>(0.23) | 0.036**<br>(2.27) | 0.045**<br>(2.38) | 0.073***<br>(2.64) | -0.056***<br>(4.02) | 0.016*<br>(1.95) |
| Observations | 990 | 906 | 1,026 | 1,367 | 1,367 | 1,306 | 1,018 |
| Controls | Included | Included | Included | Included | Included | Included | Included |
| R-squared (overall) | 0.010 | 0.035 | 0.010 | 0.018 | 0.065 | 0.004 | 0.022 |
| R-squared (within) | 0.025 | 0.121 | 0.114 | 0.069 | 0.059 | 0.104 | 0.109 |

| | Dependent variable is | | | | |
|---|---|---|---|---|---|
| | Working capital | Inventory days | Receivables days | Payables days | Cash cycle |
| Post-Referendum | 0.017<br>(1.29) | 3.343*<br>(1.80) | 0.823<br>(0.35) | 4.073**<br>(2.17) | 0.462<br>(0.17) |
| Post-Referendum * cash | -0.029*<br>(1.69) | 1.661<br>(0.43) | 8.698**<br>(2.25) | 1.856<br>(0.59) | 8.151<br>(1.55) |
| Observations | 996 | 996 | 996 | 996 | 996 |
| Controls | Included | Included | Included | Included | Included |
| R-squared (overall) | 0.196 | 0.022 | 0.060 | 0.040 | 0.099 |
| R-squared (within) | 0.158 | 0.101 | 0.145 | 0.146 | 0.089 |

This table presents coefficient estimates from a series of firm fixed effects regressions for a sample of medium sized enterprises in Ireland. The sample period is 2014-2019. The dependent variable is dividend payer (Div-payer), dividends-to-sales (Div-sales), total liabilities to book assets (TL/TA), financial debt to capital (FD/CAP), debt maturity, cash, and investment, working capital, inventory days, receivables days, payables days, and cash conversion cycle, as indicated. Post-Referendum is a dummy variable which equals 1 in years 2017, 2018, and 2019. Cash refers to firms with above-average pre-Referendum levels of cash. A full set of control variables are included but not reported.
***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

**Table 5:** Regressions by pre-Referendum leverage levels

| | Dependent variable is | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dividend policy | | Capital structure | | | Cash | Investment |
| | Div-payer | Div-sales | TL/TA | FD/CAP | Debt maturity | | |
| Post-Referendum | 0.037 | 0.013 | 0.018* | 0.027*** | -0.005 | -0.011 | 0.007 |
| | (0.67) | (1.20) | (1.69) | (2.67) | (0.27) | (0.87) | (0.91) |
| Post-Referendum * leverage | -0.056 | 0.000 | -0.048*** | -0.075*** | -0.031 | 0.029** | -0.002 |
| | (0.81) | (0.04) | (3.35) | (3.96) | (1.11) | (2.02) | (0.19) |
| Observations | 990 | 906 | 1,026 | 1,367 | 1,367 | 1,306 | 1,018 |
| Controls | Included | Included | Included | Included | Included | Included | Included |
| R-squared (overall) | 0.010 | 0.034 | 0.004 | 0.000 | 0.082 | 0.000 | 0.023 |
| R-squared (within) | 0.022 | 0.120 | 0.124 | 0.089 | 0.049 | 0.077 | 0.103 |

| | Dependent variable is | | | | |
|---|---|---|---|---|---|
| | Working capital | Inventory days | Receivables days | Payables days | Cash cycle |
| Post-Referendum | -0.020 | 7.835*** | 6.625** | 4.323 | 10.076*** |
| | (1.25) | (2.81) | (2.08) | (1.51) | (2.51) |
| Post-Referendum * leverage | 0.042*** | -6.385* | -4.032 | 0.607 | -10.558** |
| | (2.61) | (1.72) | (1.04) | (0.19) | (2.14) |
| Observations | 996 | 996 | 996 | 996 | 996 |
| Controls | Included | Included | Included | Included | Included |
| R-squared (overall) | 0.194 | 0.019 | 0.058 | 0.048 | 0.110 |
| R-squared (within) | 0.164 | 0.111 | 0.134 | 0.146 | 0.095 |

This table presents coefficient estimates from a series of firm fixed effects regressions for a sample of medium sized enterprises in Ireland. The sample period is 2014-2019. The dependent variable is dividend payer (Div-payer), dividends-to-sales (Div-sales), total liabilities to book assets (TL/TA), financial debt to capital (FD/CAP), debt maturity, cash, and investment, working capital, inventory days, receivables days, payables days, and cash conversion cycle, as indicated. Post-Referendum is a dummy variable which equals 1 in years 2017, 2018, and 2019. Leverage refers to firms with above-average pre-Referendum leverage (FD/Capital). A full set of control variables are included but not reported.
***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

changes are small and not economically significant. For each set of firms, we do not observe any changes in each of dividends, leverage, cash, or investment since 2016.

In Table 7 we analyze the firm response to the Brexit referendum by level of foreign sales. In our sample of firms, the number of firm-years with positive foreign sales is small (just 189 firm-years), which precludes us from dividing our sample by pre-Referendum levels of foreign sales. Instead, we estimate a "difference-in-difference" type regression of the following form:

$$y_{it} = \alpha + \beta_1 post - Referendum_t + \beta_2 post - Referendum_t * foreign - sales_{it} + \beta_3 foreign - sales_{it} + Controls_{it} + \alpha_1 GDP\ per\ capita_t + \mu_i + \varepsilon_{it} \quad (2)$$

"Foreign sales" is a dummy variable which equals 1 if the firm has foreign sales, and "post-Referendum * foreign-sales" is the interaction of the "post-Referendum" dummy with the "foreign-sales" indicator. $\beta_3$ captures differences in $y_{it}$ between firms with and without foreign sales; $\beta_1$ captures the change in $y_{it}$ for firms with domestic sales only after the Referendum, while $(\beta_1 + \beta_{2)}$ captures the change in  for firms with foreign sales after the Referendum. Note also that we cannot identify the $y_{it}$ location of foreign sales; ideally, we would like to capture the extent of foreign sales to the UK, but the dataset prevents us from doing so. Table 7 shows that for medium-sized Irish

**Table 6:** Regressions by pre-Referendum firm size

| | Dependent variable is | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dividend policy | | Capital structure | | | Cash | Investment |
| | Div-payer | Div-sales | TL/TA | FD/CAP | Debt maturity | | |
| Post-Referendum | -0.008<br>(0.16) | 0.012<br>(1.20) | -0.005<br>(0.38) | -0.019<br>(1.40) | -0.027<br>(1.34) | 0.002<br>(0.19) | 0.006<br>(0.80) |
| Post-Referendum * size | 0.021<br>(0.31) | 0.003<br>(0.29) | -0.013<br>(0.82) | 0.017<br>(0.89) | 0.012<br>(0.44) | 0.007<br>(0.48) | -0.001<br>(0.10) |
| Observations | 990 | 906 | 1,026 | 1,367 | 1,367 | 1,306 | 1,018 |
| Controls | Included | Included | Included | Included | Included | Included | Included |
| R-squared (overall) | 0.008 | 0.035 | 0.010 | 0.035 | 0.104 | 0.000 | 0.023 |
| R-squared (within) | 0.021 | 0.121 | 0.100 | 0.058 | 0.048 | 0.068 | 0.103 |

| | Dependent variable is | | | | |
|---|---|---|---|---|---|
| | Working capital | Inventory days | Receivables days | Payables days | Cash cycle |
| Post-Referendum | -0.004<br>(0.26) | 9.331***<br>(4.00) | 10.047***<br>(3.04) | 12.555***<br>(4.91) | 6.712*<br>(1.87) |
| Post-Referendum * size | 0.016<br>(0.90) | -8.806**<br>(2.47) | -9.610**<br>(2.51) | -12.873***<br>(4.57) | -4.974<br>(1.03) |
| Observations | 996 | 996 | 996 | 996 | 996 |
| Controls | Included | Included | Included | Included | Included |
| R-squared (overall) | 0.224 | 0.010 | 0.060 | 0.001 | 0.101 |
| R-squared (within) | 0.153 | 0.122 | 0.148 | 0.195 | 0.083 |

This table presents coefficient estimates from a series of firm fixed effects regressions for a sample of medium sized enterprises in Ireland. The sample period is 2014-2019. The dependent variable is dividend payer (Div-payer), dividends-to-sales (Div-sales), total liabilities to book assets (TL/TA), financial debt to capital (FD/CAP), debt maturity, cash, and investment, working capital, inventory days, receivables days, payables days, and cash conversion cycle, as indicated. Post-Referendum is a dummy variable which equals 1 in years 2017, 2018, and 2019. Size refers to firms with above-average pre-Referendum firm size. A full set of control variables are included but not reported.
***, **, and *, denotes statistical significance at the 1, 5, and 10% levels, respectively.

firms, the period since the passing of the Brexit referendum in 2016 is associated with increases in each of inventory days, receivables days, and payables days. We observe no differences in the response to Brexit for firms with and without foreign sales; while firms with foreign sales have policies of longer inventory and payables days, both sets of firms respond in the same ways since 2016. For both sets of firms, we never observe a change in each of dividends, leverage, cash, or investment.

## Discussion of empirical results

Earlier work finds evidence to support the building of financial flexibility during periods of economic and financial uncertainty either through more conservative dividend payouts (Bliss et al, 2015, Attig et al., 2021), leverage cuts (Lambrinoudakis et al., 2019), increased cash holdings (La Rocca et al., 2019; Martinez—Sola et al, 2018) or delays in investment spending (Fazzari et al, 1988). We differ in that we find no evidence to support the building of financial flexibility in the build up to Brexit for the full sample of firms as their debt, cash, and investment levels remain unaltered in the post-Brexit referendum period whilst their dividend payouts increase. Our different results stem from our sample of firms who on average are financially strong at the time of the Brexit referendum by way

of a combination of large cash reserves and low debt levels. This is consistent with the evidence of significant deleveraging by Irish SMEs in the decade post the global financial crisis along with a relatively strong economic recovery from 2013 onwards (McQuinn and McCann, 2017; O'Toole et al., 2021).

Yet we do find evidence of financial flexibility building by financially weaker firms; cash poor firms build cash reserves and reduce their debt levels to build financial flexibility, consistent with DeAngelo et al. (2018). We find similarly among highly-indebted firms; they too reduce their debt burden and increase their cash piles in the lead up to Brexit. The assertion is that firms build financial flexibility when incentivized to do so as debt capacity is a valuable resource. High debt burdens had a significant adverse impact on Irish SME performance in the aftermath of the global financial crisis (Lawless et al. 2015). We do find that cash rich firms invest more using some of their cash reserves and increased borrowings addressing the underinvestment gap for Irish SMEs as shown by Lawless et al (2018). In preparation for Brexit, firms appear to have established financial flexibility early on. This is in line with the publication of reports from various agencies e.g., IBEC which evaluated potential effects of Brexit on firms in Ireland (one such being limited access to finance (IBEC, 2018)). Indeed, IBEC (2018) posited that the uncertainty of Brexit could adversely impinge on the UK market, weakening demand for Irish exports and thus limiting the availability of external finance in light of reduced business.

Changes in firms' working capital provide insights into the short-term financial decisions of Irish medium sized firms. We observe increases in inventory spend which is partially financed by increases in accounts payable. The increases in inventory that we observe in the lead up to Brexit are most pronounced for each of low cash firms, and less indebted firms. Holding more stock is consistent with Dbouk et al (2020) and with Bord Bia (Irish Food Board) who highlight the practice of stockpiling among Irish food and drink manufacturers in 2019. Irish SMEs appear to hold more stock for fear of supply chain frictions or input price fluctuations. The extended credit from suppliers reaffirms the importance of trade credit for Irish SMEs (see McGuinness and Hogan., 2016).

Differences in trade credit provision and receipt is found to depend on firm liquidity. Cash rich medium sized enterprises extend more credit to their customers than they receive thereby supporting the redistribution hypothesis of trade credit depicted by Meltzer (1960). This net credit provision depends on firms own financial situation concurring with Calomiris et al (1995) and Lawrnz and Oberndorfer (2018). Confirmation of this redistribution effect was also found by McGuinness and Hogan (2016) in that Irish SMEs with large cash reserves entering the global financial crisis were subsequently net providers of credit to others.

Equally, we find that cash poor firms reduce their debt levels and take more trade credit than they provide which supports the substitution hypothesis, consistent with Carbo-Valverde et al (2016) and the Irish evidence of McGuinness and Hogan (2016); credit constrained firms reliance on trade credit increases with uncertainty and in crisis periods. Trade credit serves as an important buffer for financially constrained SMEs (Petersen and Rajan, 1997; Ferrando and Mulier 2013) and for Irish SMEs (Casey and O'Toole, 2014; McGuinness and Hogan, 2016). Indeed, Petersen and Rajan (1997) posit in the absence of financial institutional lending, constrained firms employ more trade credit, lending credence to the suppliers' informational advantage where during business transactions, trade suppliers acquire information at greater speed and efficiency.

## CONCLUSION

This paper examines the building of financial flexibility by Irish medium sized firms in the six-year period surrounding the passing of the Brexit referendum in 2016. We do so by examining changes in firms' dividends, leverage, cash, investment levels and working capital in the three-year period prior to the Brexit referendum to the subsequent three years post the referendum. In general firms appear well equipped to cope with Brexit as they have relatively low debt levels, generous cash holdings and see little need to build greater flexibility except in the case of financially weaker firms. The assertion is that firms adapt and those more incentivized to build flexibility do so.

This paper contributes to the financial flexibility literature with new evidence for an important cohort of firms given the openness of the Irish economy and the contribution of medium-sized firms to Irish exports. First, our findings highlight the importance for firms of maintaining large cash balances. Cash-rich firms invested more after the passing of the Brexit referendum in 2016 and thus appeared to be largely unaffected by the uncertainty surrounding Brexit. In contrast, cash-poor firms responded by building financial flexibility. During the global financial crisis, cash-rich corporations continued to invest while also maintaining their dividend payouts (see Duchin et al., 2010; Bliss et al., 2015). Second, we add to the extant theoretical models providing support for the substitution hypothesis in

which Petersen and Rajan (1997) state debt finance and trade credit can act as substitutes. Our findings once again highlight the importance of cash positions. Cash-poor firms substituted financial debt for trade debt, consistent with the substitution hypothesis. Third, we also support the redistribution hypothesis, in that it is cash-rich firms which appear to be the providers of liquidity to cash-poor firms.

Our findings have important implications for policy makers. The importance of government agencies and their supports cannot be underestimated for Irish SMEs. The comprehensive range of support measures rolled out by the key government agencies at local and national level from early 2017 onwards may partly explain SMEs optimism about the future despite the uncertainty of Brexit. Such measures included grants, loan schemes, advisory, mentoring and market research supports. Tailoring a package of future supports may be particularly important for the weaker and more credit vulnerable firms. The reliance on short term sources of finance and importance of working capital illustrates the need for other sources of financing such as invoice discounting and factoring which policy makers need to address particularly at a time of greater concentration in the Irish banking system. Furthermore, the need to address the investment gap among Irish SME warrants greater consideration by policy makers. Finally, while overall Irish firms appeared to have incorporated financial flexibility into their capital structure, there is some evidence to suggest that cash-poor and highly indebted firms did try to build in some financial flexibility by reducing their debt levels. In line with Gama and Triantis (2008, pp. 2263) who posit financial flexibility reflects 'the ability of a firm to access and restructure its financing at a low cost' (Rapp, Schmid and Urban, 2014), providers of finance need to ensure an institutional environment exists within which accessibility and restructuring can be facilitated and financial flexibility can be encouraged. Rapp et al (2014) stipulate regulators of capital markets need to facilitate firm growth especially for firms where financial flexibility is imperative. Thus, an institutional environment which facilitates financial flexibility is a key policy implication.

This study is not without its limitations. Our sample is confined to Irish medium sized firms only. Our reliance on quantitative data prevents us from garnering the view of owner managers on the importance of financial slack. Future work could consider UK SMEs and their financial flexibility in the build up to Brexit. It would be useful also to revisit our sample three years post Brexit coming into effect and assess changes in their financial flexibility and their resilience in the aftermath of the Covid pandemic.

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