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Levelling the debt–equity playing field: Evidence from Belgium

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ABSTRACT

I explore whether a Belgian policy that reduced the corporate tax bias towards debt finance was successful in lowering firm leverage. Using putatively exogenous time series variation in the cost of equity financing and a difference-in-differences strategy that includes similar firms from surrounding countries, I find that the policy did lead to increased equity ratios, with some evidence of a shift from short-term debt to long-term debt.

1. Introduction

In most corporate tax systems, firms can reduce their taxable income by the interest they pay to their debt-holders, while payments to equity-holders receive no such preferential treatment. Several recent financial and economic crises have reignited the academic and public policy debate about this debt bias and the resulting impact of high firm leverage.[2] In this paper, I investigate the effectiveness of one tool for reducing this bias. In 2006, the Belgian government implemented the Notional Interest Deduction (NID), which levelled the playing field between equity and debt by allowing firms to reduce their taxable income based on their amount of equity capital. The main motivation for the policy was a European Commission ruling, not domestic economic conditions. This provides putatively exogenous time series variation in the cost of equity financing, which I exploit as part of a difference-in-differences strategy. I use several firm- and country-level controls, and data from firms in countries surrounding Belgium, which are economically integrated and culturally similar, and did not experience major tax policy changes around the time of the NID's implementation. I find that the NID was successful in increasing equity ratios of Belgian firms by approximately three percentage points (compared to a pre-NID mean equity-to-asset ratio of 39%). There is also some evidence of a shift from short- to long-term debt. Results are robust to including several control variables, to the use of a matching strategy to increase the comparability of the non-Belgian sample, and to several alternative specifications. Analysis of heterogeneous effects provides some evidence that the

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[2] The Mirrlees Review found that the bias towards debt discourages business investment and exposes firms to greater risk of bankruptcy, the LSE Growth Commission argues that it distorts long-term investment incentives, and The Economist magazine describes it as a "senseless subsidy that wins the title of the world's worst economic distortion" (Mirrlees et al., 2010; Aghion et al., 2013; Economist, 2015).

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greatest increase in equity occurred for firms in sectors with the highest pre-NID revenue volatility, which may particularly benefit from the implicit insurance of equity finance.

In contrast to many studies exploring the effects of taxes on firm financing, the NID generated large putatively exogenous time series variation in the cost of equity. The existing literature on the NID has shown mixed results, likely due to a lack of statistical power in studies that investigated the initial impacts, especially those that focused on SMEs. For example, Van Campenhout and Van Caneghem (2013) and Kestens, Van Cauwenberge, and Christiaens (2012) find conflicting evidence for the impact on SMEs (using sample sizes of 614 and 4474 respectively). Princen (2012), using a sample of 3332 Belgian firms one year after the NID, argues that the NID led to lower leverage relative to French firms. Panier, Pérez-González, and Villanueva (2013) use a larger sample and do find a significant short-term effect on equity ratios. Other papers focus on the impact on multinationals, often finding evidence of lower leverage achieved through intra-group tax arbitrage strategies (Hebous and Ruf, 2017; Konings et al., 2018).[3] I use a large and longer-term sample than much of the existing literature, and I show that the NID was effective in reducing leverage when the sample includes large firms that are part of a broader group (thus providing a replication of previous results) as well as using a sample of only medium-sized, stand-alone firms (for which the evidence to date is scant).

2. Identifying the impact of the NID

'Allowance for Corporate Equity' (ACE) systems, of which the Belgian Notional Interest Deduction (NID) is one type, mitigate the classic debt tax bias by introducing a similar deduction for equity.[4] Several countries have introduced ACE-like reforms, but many were implemented in a restricted form and for a short period, and often occurred at the same time as other tax policy changes (Klemm, 2007; Zangari, 2014). The main motivation for the implementation of the Belgian NID in 2006 was not domestic economic conditions; the policy was a response to a European Commission ruling on 'coordination centres', which were companies that provided financial, accounting and administrative services on behalf of their multinational group, and had benefitted from advantageous tax legislation from 1982 to 2003 (Valenduc, 2009; Panier et al., 2013; Célérier et al., 2018). In 2003, the European Commission ruled that coordination centres contravened EU rules on state aid; since many such centres were equity financed, the NID offered a way for the tax authorities to mitigate the risk of multinationals leaving Belgium.

The NID allowed firms to reduce their taxable profit using a simple formula: the product of the firm's adjusted book value of equity and the average rate on ten-year Belgian Government Bonds. If the firm's rate of return on equity was less than or equal to the NID rate, it would face a zero corporate tax rate. A higher return on equity would only be subject to corporate tax at a rate equal to the excess of its return over and above the NID rate, thereby reducing its effective corporate tax rate. All Belgian firms were eligible for the NID, but the policy was implemented in a way that complicated the incentives for small firms, defined as having fewer than 100 employees and not exceeding more than one of the following three thresholds: (i) total assets of €3.65 million; (ii) revenue of €7.3 million; or (iii) 50 employees. Small firms were actually provided with an additional incentive to implement the NID (an extra 0.5% deduction), however, two concurrent policy provisions made it less attractive for smaller firms to increase their equity (Van Campenhout and Van Caneghem, 2013; Zangari, 2014). The first was the elimination of a tax credit for firms that increase their equity capital above the maximum that it had reached in the previous three years. The second was the discontinuation of a programme that allowed firms to reduce their taxable income based on the value of their investments that were funded with retained earnings. Given the combined allowance amount of €38,600, it is possible to calculate a cutoff above which firms would have benefited from the NID. Specifically, assuming a 2.7% NID rate (the average rate since inception, as of 2013), firms with total equity greater than €1.43 million would have benefited from increasing their equity capital through the NID. This is equivalent to total assets of €3.7 million, using the sample average pre-NID equity-to-asset ratio of 38.6%. I then use a value of €4 million in pre-NID total assets as a cutoff to distinguish small firms from larger firms.

I use a difference-in-differences (DiD) strategy to exploit time series variation in the cost of equity arising from the NID. The 'treatment group' is Belgian firms with total assets greater than €4 million in the two years prior to the NID's introduction (henceforth referred to as 'large'), and the control group is similarly sized firms from surrounding countries (France, Germany, Luxembourg and the Netherlands). Firms in these countries are geographically and culturally close, and their relative economic integration means that they are exposed to similar shocks and trends. Furthermore, there were no major tax policy changes in these countries around the introduction of the NID in 2006 (Panier et al., 2013; Konings et al., 2018). Appendix Figure A.1 illustrates the strong correlation between GDP growth of Belgium and surrounding countries. In some specifications, I also include small firms from both Belgium and surrounding countries as a within-country control for domestic time trends (i.e. a 'triple-difference' specification), which mitigates concerns about bias arising from leverage ratios trends that are unrelated to the NID. I also draw on the extensive theoretical and empirical corporate finance literature on capital structure determinants when including baseline control variables.[5]

Fig. 1 provides a preview of results and visual support for the 'common trends' identifying assumption of the DiD estimator: small and large firms from surrounding control countries appear to be on a parallel trend throughout the ten-year period; in contrast, while

[3] Other studies have focused on the effect of the NID for financial institutions (Schepens, 2016; Célérier et al., 2018).

[4] ACE systems are based on the concept of a 'pure profits' tax that obtains revenues in a non-distorting manner due to the neutral taxation of capital income (Boadway and Bruce, 1984; Devereux and Freeman, 1991). ACE systems have been promoted by the Mirrlees Review and by the Institute for Fiscal Studies as a way of achieving tax neutrality between debt and equity financing (Gammie, 1991; Mirrlees et al., 2010).

[5] The most relevant theory is the 'trade-off theory' of capital structure, which highlights the importance of taxes and bankruptcy costs for firms' choice of leverage (Kraus and Litzenberger, 1973; Miller, 1977; Myers, 1984), and predicts that leverage would decrease as a result of the NID. Other influential theories make predictions about the relationship between leverage and firm size, profitability, tangibility and liquidity ratios (Myers, 1984; Myers and Majluf, 1984; Rajan and Zingales, 1995; Hall et al., 2004), and I include their pre-NID levels as controls, as well as their pre-NID growth rates, following Quinn (2014).

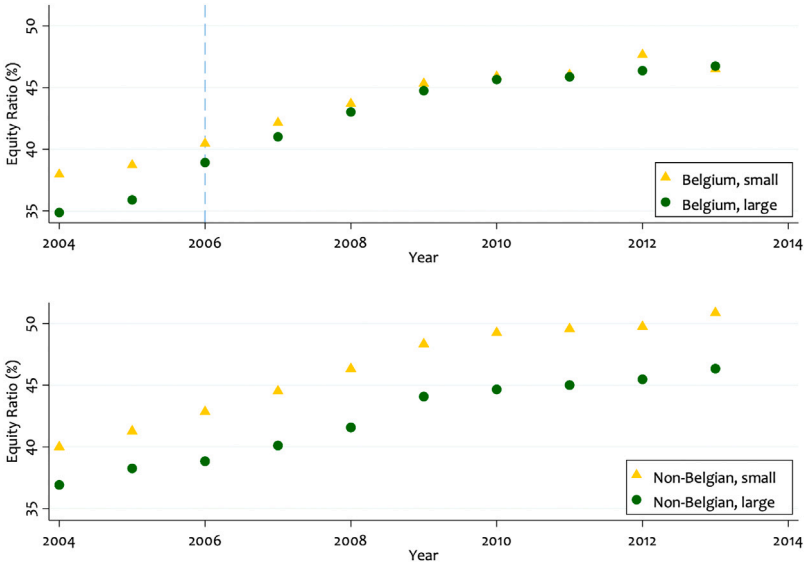

Fig. 1. Evolution of equity ratio.
Note: This figure displays the average equity-to-asset ratio for firms in every year in the sample. The top panel displays the equity ratio for Belgian firms, categorised by size: (i) large firms (those with total assets greater than €4 million in the two years prior to the implementation of the NID in 2006, indicated by the blue dashed line) who comprise the 'treatment group' for whom the NID provided a strong incentive to increase equity ratios; (ii) small firms, those with assets less than €4 million in the two pre-NID years, who (due to the nuances of policy implementation, discussed in Section 2) form a within-country control for the treatment group. The bottom panel displays the evolution of equity ratios for all non-Belgian firms (from France, Germany, Luxembourg, and the Netherlands), with a similar categorisation by size. Format tests of parallel trends, using a number of specifications, are provided in the appendix.

trends appear to be parallel for small and large Belgian firms up until the implementation of the NID in 2006, after 2006 equity ratios jump up significantly for large Belgian firms only. Appendix Tables A.1 and A.2 contain several regressions that formally test for the parallel trends assumption, using the method described by Kahn-Lang and Lang (2020). In each of the 14 tests, I fail to reject the null of equal trends, whether it is testing for equal trends between large Belgian firms and large non-Belgian firms, or testing for equal trends between small and large firms within each country. Notwithstanding this, in the regressions I explicitly allow for a differential trend in the post-NID period, following recommendations in the DiD literature (Bilinski and Hatfield, 2018).

3. Data and baseline summary statistics

The sample consists of ten years of annual data for firms from Belgium, France, Germany, Luxembourg, and the Netherlands. The data were extracted from Bureau van Dijk's Orbis database, covering 2004 to 2013. The Belgian data are of a high quality, since Bureau van Dijk uses financial information filed at the National Bank of Belgium, and given that all Belgian firms are legally required to report the total value of their assets, equity and non-equity liabilities. The coverage of the French data is also very comprehensive, given that all firms in France must file standardised financial accounts to the authorities. The coverage is less comprehensive for Germany, Luxembourg, and the Netherlands, where there are relatively less standardised and systematic disclosure requirements for all private firms (Princen, 2012; Panier et al., 2013). I use all available data for limited liability corporations with information available for at least one year in the two years prior to the NID. I exclude firms whose assets were below €500,000 in any pre-NID year, since their leverage decisions may reflect household considerations. Following Kalemli-Özcan et al. (2018) and Barbiero et al. (2020), I drop firm-year observations in which total assets, fixed assets, short-term debt, long-term debt, or total shareholder funds have negative values, and I also drop country-specific sectors such as agriculture and mining, sectors with high government ownership, and heavily regulated sectors such as finance. To account for outliers, I winsorize all variables at the 2.5% level in each tail of the distribution.

I use a balanced panel containing up to 1,154,684 firm-year observations from 126,172 firms (comprising 35,406 Belgian firms, with 79% of the non-Belgian data coming from France). Appendix Table A.3 presents baseline summary statistics. The average size of Belgian and French firms is similar, with mean log assets of 7.28 and 7.31 respectively (based on total assets in thousands of €), while firms in other countries are larger on average, which is unsurprising given the aforementioned reporting requirements. The average age of Belgian and French firms is comparable (26.4 and 26.7 years respectively). While there are some baseline differences, these do not invalidate the common trends assumption required for identification of the DiD estimator. Nonetheless, to further increase confidence in the results I follow the recommendation of Ryan, Kontopantelis, Linden, and Burgess (2019) and McKenzie (2020) by implementing a matched DiD using a more comparable set of firms from surrounding countries, matched on the pre-NID

Table 1
Effect of the NID on equity ratios.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Belgium * Post * Large	3.65***	3.66***	3.00***	2.68***				
	(0.611)	(0.611)	(0.259)	(0.250)				
Belgium * Post	−0.67***	−0.67***	0.16	0.14	2.98***	2.99***	3.16***	2.09***
	(0.128)	(0.128)	(0.099)	(0.099)	(0.597)	(0.597)	(0.240)	(0.225)
Belgium * Large		0.08	0.82**	−1.98***				
		(1.114)	(0.411)	(0.394)				
Post * Large	−1.36***	−1.38***	−2.31***	−1.88***				
	(0.348)	(0.348)	(0.113)	(0.120)				
Belgium		−2.29***	−0.25	1.96***		−2.21**	0.57	0.03
		(0.217)	(0.160)	(0.164)		(1.093)	(0.379)	(0.377)
Large		−3.05***	−2.13***	0.42				
		(0.662)	(0.193)	(0.275)				
Post	7.04***	7.05***	5.93***	−0.49***	5.68***	5.67***	3.62***	−1.48***
	(0.081)	(0.081)	(0.051)	(0.065)	(0.338)	(0.338)	(0.100)	(0.130)
Dependent variable mean	39.52	39.52	38.95	38.95	36.73	39.52	38.95	37.38
Small firms	✓	✓	✓	✓				
Group/subsidiary firms			✓	✓			✓	✓
Firm fixed effects	✓				✓			
Sector-year fixed effects				✓				✓
Baseline controls				✓				✓
Observations	479,636	479,636	1,154,684	1,087,382	22,799	22,799	205,966	181,737

Note: This table presents results for the impact of the NID on firm leverage. The dependent variable in all columns is the equity to total assets ratio. Post and Large are indicator variables for the post-NID period and for having greater than €4 million in pre-NID total assets (the cutoff above which Belgian firms would have benefited from the NID). Baseline controls consist of the pre-NID levels and growth rates of the firm's profitability, tangibility and liquidity ratios, the pre-NID growth rate of the equity ratio itself, as well as country-level controls for GDP and statutory corporate tax rates (top federal-level rate). Standard errors, clustered at the firm level, are reported in parentheses below each coefficient estimate. *** $p < 0.001$, ** $p < 0.05$, * $p < 0.10$.

profitability, tangibility, and equity ratios, as well as business sector.[6] In the unmatched sample, mean equity ratios, defined as the sum of shareholders' funds and retained earnings as a proportion of its total assets, are slightly lower for Belgian firms (38.5%) compared to French firms (39.2%). Column 6 of Appendix Table A.3 demonstrates that the matching strategy is successful in bringing the characteristics of the matched sample closer to the Belgian sample, in terms of profits to total assets (a mean of 6.7% in Belgium), the tangible to fixed assets ratio (a mean of 31% in Belgium), and the sectoral composition.

4. Results

I exploit time series variation in the cost of equity financing and a difference-in-differences strategy:

$$y_{it} = \beta_0 + \beta_1 Post_t + \beta_2 Treatment_i + \beta_3 Post_t * Treatment_i + \boldsymbol{\beta}_4 \boldsymbol{X}_{i0} + \epsilon_{it} \quad (1)$$

where y_{it} is the leverage ratio of firm i at time t (using equity ratios or debt ratios), $Post_t$ is an indicator variable for the post-NID period (2006 onwards), $Treatment_i$ is an indicator for Belgian firms with total assets above €4 million in the pre-NID period, and control firms are those in surrounding countries (France, Germany, Luxembourg, and the Netherlands). The coefficient of interest is β_3, which will be positive if the NID led to an increase in equity ratios for Belgian firms (or negative when the dependent variable is the debt ratio). In some specifications, I include baseline controls for variables that have been shown to be important determinants of firm leverage. In other specifications, I also include small firms from Belgium and surrounding countries as an additional within-country control group.

Results for the effect of the NID on equity ratios are presented in Table 1. Columns 1, 2, 5, and 6 include only stand-alone firms, with the remaining columns including all firms that are part of a larger group/subsidiary of a multinational. Columns 1 and 5 include firm fixed effects, and columns 2, 3, 6, and 7 present OLS regressions with no controls other than a dummy variable for Belgium (to control for permanent differences between Belgium and the other countries), a dummy for the post-NID period (which controls for common trends), a dummy for large firms (only in the triple-difference specifications that include small firms), and the interaction of all these variables. Columns 4 and 8 include sector fixed effects and the aforementioned baseline controls. Beginning with the first four columns (which include small firms, and contain up to 1,154,684 firm-year observations), results indicate a positive impact of the NID on equity ratios, with a coefficient on $BEL * Post * Large$ that ranges from 2.68 percentage points to 3.66 percentage points, compared to the baseline mean equity ratio of 39%, and with all coefficients significant at the 1% level. In columns 5 to 8, the sample is restricted to firms with total assets above €4 million in the pre-NID period (i.e. dropping all small firms), but results

[6] I implement a nearest neighbour propensity score matching procedure (with replacement), enforcing common support and calipers of 0.01, following Ryan et al. (2019). Subsequent weights (representing the number of Belgian observations for which the particular non-Belgian firm is a match) are used as frequency weights in the subsequent empirical estimation.

Table 2
Effect of the NID on debt ratios.

	(1) S/T debt	(2) S/T debt	(3) S/T debt	(4) S/T debt	(5) S/T debt	(6) S/T debt	(7) L/T debt	(8) L/T debt
Belgium * Post * Large	−5.31***	−4.32***	−5.57***				3.58***	
	(0.653)	(0.260)	(0.261)				(0.189)	
Belgium * Post	1.53***	1.26***	1.28***	−3.78***	−3.06***	−3.38***	−4.24***	−0.26
	(0.125)	(0.097)	(0.097)	(0.641)	(0.241)	(0.238)	(0.078)	(0.169)
Belgium * Large	13.11***	9.17***	6.23***				−3.77***	
	(1.166)	(0.426)	(0.400)				(0.242)	
Post * Large	1.85***	2.44***	3.45***				−1.76***	
	(0.404)	(0.127)	(0.142)				(0.106)	
Belgium	−7.40***	−8.80***	−6.81***	5.71***	0.37	−1.17***	7.98***	4.67***
	(0.208)	(0.155)	(0.161)	(1.147)	(0.396)	(0.386)	(0.100)	(0.226)
Large	−2.86***	−1.13***	−1.83***				1.52***	
	(0.719)	(0.213)	(0.276)				(0.148)	
Post	−4.58***	−4.27***	−1.77***	−2.73***	−1.83***	−1.57***	−0.15*	0.58***
	(0.078)	(0.052)	(0.092)	(0.397)	(0.116)	(0.189)	(0.078)	(0.155)
Dependent variable mean	44.14	46.81	46.81	44.14	46.81	48.26	9.29	7.82
Small firms	✓	✓	✓				✓	
Group/subsidiary firms		✓	✓		✓	✓	✓	✓
Sector-year fixed effects			✓			✓	✓	✓
Baseline controls			✓			✓	✓	✓
Observations	479,454	1,154,355	1,087,177	22,772	205,890	181,699	1,087,086	181,672

Note: This table presents results for the impact of the NID on firm leverage, from the perspective of debt ratios. The dependent variable in columns 1 to 6 is the short-term debt to total assets ratio and in columns 7 and 8 it is the ratio of long-term debt to total assets. Post and Large are indicator variables for the post-NID period and for having greater than €4 million in pre-NID total assets (the cutoff above which Belgian firms would have benefited from the NID). Baseline controls consist of the pre-NID levels and growth rates of the firm's profitability, tangibility and liquidity ratios, the pre-NID growth rate of the equity ratio itself, as well as country-level controls for GDP and statutory corporate tax rates (top federal-level rate). Standard errors, clustered at the firm level, are reported in parentheses below each coefficient estimate. *** $p < 0.001$, ** $p < 0.05$, * $p < 0.10$.

are similar; the coefficient on $BEL * Post$ indicates a positive impact of the NID on equity ratios that ranges from 2.09 to 3.16 percentage points, with each coefficient again statistically significant at the 1% level.

In Table 2, I repeat the analysis using the debt ratio as the dependent variable. Results provide reassurance about the quality of the balance sheet data; estimated impacts on net debt (the sum of effects on short-term and long-term debt) are of similar magnitude (and opposite sign) to those on equity ratios, confirming that the post-NID period was associated with a lower leverage ratio for Belgian firms. Moreover, there is evidence of a more nuanced effect on debt ratios, when investigating separately the impact on short- and long-term debt. Specifically, there is strong evidence of the NID leading to lower short-term debt ratios, with mixed evidence of a small positive impact on the long-term debt ratio (suggesting some substitution from short-term to long-term debt). In columns 1 to 3, where small firms are included, and the number of controls are gradually increased, the coefficient on $BEL * Post * Large$ ranges from −4.32 to −5.57, with all coefficients significant at the 1% level. Columns 4 to 6 repeat the analysis without the within-country control for small firms, and find a similar impact, with the coefficient on $BEL * Post$ ranging from −3.06 to −3.78, with all coefficients again significant at the 1% level. This is in contrast to the results in columns 7 and 8, which present the same specification (with the full set of controls) but using the long-term debt ratio as the dependent variable, and alternatively using the sample with and without small firms. In column 7, the coefficient on $BEL * Post * Large$ is actually *positive*, with a coefficient of +3.58 percentage points; however, the coefficient on $BEL * Post$ in column 8 is insignificantly different from zero.

In Table 3, the analysis from Tables 1 and 2 is replicated using a matched set of comparison firms. The findings are consistent with the previous results; there is a relatively large and statistically significant positive impact of the NID on the equity ratios of Belgian firms. Further, there is an even larger (in absolute magnitude) decrease in short-term debt ratios, with some mixed evidence of a partial offset with greater long-term debt.

5. Robustness and further analysis

In the Appendix, I present results using several alternative specifications as further robustness checks for the main results. First, in Appendix Table A.4, I demonstrate that results are robust to collapsing the dataset to a two-period panel (pooling the pre- and post-NID periods). This follows the recommendation of Bertrand, Duflo, and Mullainathan (2004) to address concerns about serial correlation in DiD estimations (especially when the dependent variable is positively serially correlated), which may lead to an underestimation of standard errors. Second, I mitigate potential concerns about survivorship bias stemming from the use of a balanced panel, by repeating all the analysis with the full (unbalanced) panel. Results in Tables A.5 and A.6 demonstrate robustness of the earlier findings, with the magnitudes of the estimated coefficients increasing in many of the specifications. Third, in Table A.7, I demonstrate robustness of the results to systematically adding France, Germany, Luxembourg, and the Netherlands as the control group (compared to Tables 1, 2, and 3, where all countries are included at once).

Table 3
Estimation with matched sample.

	(1) Equity	(2) S/T debt	(3) L/T debt	(4) Equity	(5) S/T debt	(6) L/T debt
Belgium * Post * Large	2.10***	−4.54***	2.99***			
	(0.410)	(0.463)	(0.368)			
Belgium * Post	0.21	−0.22	−3.86***	1.82***	−3.57***	−0.59*
	(0.168)	(0.174)	(0.148)	(0.315)	(0.383)	(0.307)
Belgium * Large	−3.45***	7.44***	−3.46***			
	(0.665)	(0.648)	(0.446)			
Post * Large	−1.44***	3.88***	−2.72***			
	(0.349)	(0.410)	(0.336)			
Belgium	−0.34	−3.39***	8.23***	−3.03***	4.09***	4.34***
	(0.277)	(0.253)	(0.176)	(0.606)	(0.624)	(0.381)
Large	1.94***	−4.32***	1.94***			
	(0.671)	(0.634)	(0.447)			
Post	−0.16	−0.56***	1.63***	−1.08***	0.29	0.88***
	(0.155)	(0.194)	(0.168)	(0.289)	(0.387)	(0.306)
Dependent variable mean	39.40	42.09	14.16	39.40	42.09	14.16
Small firms	✓	✓	✓			
Group/subsidiary firms	✓	✓	✓	✓	✓	✓
Sector-year fixed effects	✓	✓	✓	✓	✓	✓
Baseline controls	✓	✓	✓	✓	✓	✓
Observations	481,575	481,525	481,519	78,045	78,033	78,028

Note: This table replicates the main analysis from Tables 1 and 2, using a matched sample of firms from surrounding countries to increase comparability with the Belgian sample. Matching is performed using baseline (pre-NID) profitability ratios, tangibility ratios, equity ratios, and business sector. A nearest neighbour propensity score matching procedure (with replacement) is implemented, enforcing common support and calipers of 0.01. Each specification also contains the same set of baseline control variables as in Tables 1 and 2. Standard errors, clustered at the firm level, are reported in parentheses below each coefficient estimate. *** $p < 0.001$, ** $p < 0.05$, * $p < 0.10$.

In Tables A.8 and A.9, I explore whether the NID had heterogeneous impacts on firms in the most risk-exposed sectors, for whom the performance-continent nature of equity payments may be particularly beneficial. Using several specifications and sample selection criteria, I find that firms in the most risk-exposed sectors (captured by the sector-level coefficient of variation of revenue in the pre-NID period) experienced the greatest increase in equity ratios as a result of the NID. Tables A.10 and A.11 reveal a similar pattern when using the sector-level standard deviation of revenue as the measure of risk exposure. Finally, in Table A.12, I show that these sectors also happen to be those that created the most jobs across the EU between 2000 and 2014.

6. Conclusion

Debt finance serves many critical functions in the economy, allowing cash-constrained firms to borrow against future profits, without diluting ownership and control. However, systematically discriminating against equity can lead to excessive leverage. This can increase financial system fragility, which may be an especially important concern during recoveries from economic and financial crises. For example, in response to COVID-19, governments across the world implemented over 1600 measures directly aimed at supporting firms, with a large share of those involving debt finance (Cirera et al., 2021). Equity-like financing can provide firms with a flexible form of capital that spreads risk more effectively; payments to equity-holders can be reduced in times of financial stress, and equity does not need to be re-financed. There has been much discussion about the need to encourage greater capital buffers for firms, especially following the 2008 global financial crisis and subsequent European debt crisis. Yet, there is a tension in the conflicting policy of asking banks to hold more equity through capital requirements while simultaneously encouraging them to hold more debt through the tax system, which significantly complicates and distorts the functioning of the financial system (Mayer et al., 2018).

In this paper, I find that a policy to level the playing field between debt and equity was successful in reducing leverage for firms, leading to higher equity ratios and some suggestion of a shift from short-term debt towards longer-term debt. While this highlights the exciting potential of ACE-type models, there is a need to carefully consider the possible exploitation of such policies, for example through intra-group tax arbitrage strategies by multinationals (Hebous and Ruf, 2017). Nonetheless, ACE-like models provide one plausible tool to answer the increasing calls for policymakers to take an active role in dealing with high firm leverage, especially for SMEs, who were disproportionately affected by the COVID-19 crisis and may find it harder to issue conventional equity through capital markets (and/or may be more averse to ownership dilution). Other novel proposals include linking loan repayments to business returns, as well as more radical suggestions such as a pan-European Pandemic Equity Fund that allows all European citizens to participate in a risk- and reward-sharing mechanism for firms (Boot et al., 2020; IMF, 2020; OECD, 2020; Revoltella et al., 2020; Sandbu, 2020). This is undoubtedly an exciting and important time for further empirical and theoretical work in this area.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.euroecorev.2022.104305.

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