Capital Structure and Taxes: What Happens When You (Also) Subsidize Equity?

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Abstract. This paper shows that capital structure significantly responds to changing tax incentives. To identify the effect of taxes, we exploit the introduction of a novel tax provision (the notional interest deduction, or NID) as an arguably exogenous source of variation to the cost of using equity financing. The NID, introduced in Belgium in 2006, drastically reduces the tax-driven distortions that favor the use of debt financing by allowing firms to deduct from their taxable income a notional interest charge that is a function of equity. Our main findings are four. First, the NID led to a significant increase in the share of equity in the capital structure. Second, both incumbent and new firms increase their equity ratios after the NID is introduced. Third, the largest responses to these changing tax incentives are found among large and new firms. Fourth, the increase in equity ratios is explained by higher equity levels and not by a reduction in other liabilities. The results are robust to using data from neighboring countries as a control group, as well as, relying on a battery of tests aimed at isolating the effect of other potential confounding variables. Overall, the evidence demonstrates that tax policies designed to encourage the use of equity financing are likely to lead to more capitalized firms.

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Do changing tax rates affect capital structure decisions? In the absence of the traditional tax rules that favor debt financing, what would be the observed leverage ratios of firms? If firms respond to time-varying tax incentives, which firms and financial policies would be most sensitive to these changes? While the answers to these questions are central to corporate finance research, to this date, we know surprisingly little about them.

Following Modigliani and Miller (1958, 1963), optimal financing decisions maximize the after-tax value of the firms' total cash-flows. While there is near-universal agreement that taxes must be relevant for corporate financing decisions, to this date, the empirical evidence linking corporate income tax rates and capital structure has been weak at best.[1] This issue is not new. In 1984, Myers wrote: "I know of no study clearly demonstrating that a firm's tax status has predictable, material effects on its debt policy." Moreover, the empirical relevance of taxes for financing decisions has been the subject of a renewed and heated debate in light of the recent financial crisis and the high levels of leverage used by many firms. Yet, to this date, "there is no known study that documents tax-related time series effects in debt usage" (Graham, 2008).

To investigate the effect of taxes on capital structure, we exploit the introduction of the notional interest deduction (NID) in Belgium as an arguably exogenous source of variation to the cost of using equity financing. The NID is an explicit equity deduction introduced in 2006 with the objective of reducing the tax-driven distortions that favor the use of debt financing. The NID allows firms to deduct from their taxable income a notional charge equal to the product of the book value of equity times a benchmark interest rate based on historical long-term government bonds. As a result, and in sharp contrast to traditional tax incentives, firms' marginal financing decisions are provided with a significant tax deduction regardless of their source of financing.

Using data from the National Bank of Belgium (NBB), we show that the introduction of the NID was correlated with a significant increase in the share of equity used by Belgian firms. We document that the aggregate value of equity, relative to total non-equity liabilities increased, and that both the mean and median share of equity to assets at the firm level increased right after the introduction of the notional interest deduction.

[1] For a mainstream exposition of the effect of corporate income taxes on capital structure, see Berk and DeMarzo (2010) or Brealey, Myers, and Allen (2010). See Graham (2008) for an excellent survey on the impact of taxes on corporate finance.

To further identify the effect of the NID on capital structure decisions, we use firm-level data from Belgium's neighboring countries as a credible counterfactual. Firms in France, Germany, Luxembourg, and the Netherlands are geographically close, economically integrated, and share the same currency as Belgian firms. As such, they are likely to be exposed to common industry and aggregate shocks. Yet, these countries did not introduce equity deductions, such as the NID, or major tax reforms right around 2006. We obtain firm data from these control countries from Bureau Van Dijk (BvD)'s AMADEUS database for the 2001 to 2009 period, and verify that during the sample period, aggregate trends in gross domestic product, and total sales for the sample firms, are remarkably comparable between Belgian and control firms.

Using this empirical strategy, our main findings are five:

First, the introduction of an equity-based interest deduction led to higher capitalization rates in Belgium. We document large increases in equity ratios within two years after the reform was enacted. Moreover, we rule out the effect of other confounding variables using a battery of tests. For example, controlling for firm, industry, and country characteristics including other tax variables, does not affect the findings. Similarly, time-varying industry effects do not affect the results. We show that limiting the analysis to control firms located within 100 kilometers of the Belgian border, or to those sharing a common language, leaves the results unchanged. Also, using a subsample of matched firms based on pre-reform observable characteristics (Heckman, Ichimura and Todd, 1997), we replicate the results. We also show that using data from all European firms in AMADEUS as an alternative control, does not affect the findings. To bolster the causal interpretation of the results, we provide several placebo tests that show that the NID effects are unlikely to be spurious. Lastly, we verify that the impact of the NID on capital structure is robust to clustering the standard errors at the country level, the key source of variation in the analysis (Bertrand, Duflo, and Mullainathan, 2003).

Second, both incumbent and new Belgian firms significantly increase their equity ratios. Using fixed effects specifications, we show that incumbent firms rebalance their capital structure as the cost of equity financing declines after 2006. Similarly, we show that new firms entering Belgium after the NID was enacted rely more heavily on equity relative to firms incorporated prior to 2006, or to new firms in the control countries.

Third, the largest responses to these changing tax incentives are found among large and new firms. This evidence is consistent with the idea that small firms may face significant refinancing costs, or that they may not rebalance their capital structure until they deviate substantially from their long term target (Leary and Roberts, 2005; Strebulaev, 2007). In fact, in several specifications, the post-2006 leverage behavior of small firms is indistinguishable from the capital structure decisions of the control firms.

Fourth, the increase in equity ratios of Belgian firms is explained by an economically large and statistically significant increase in the levels of equity, and it is not driven by a reduction in the value of non-equity liabilities. Moreover, we show that the higher values of equity cannot be exclusively explained by retentions of the notional interest deduction after 2006 or by lower dividends, and are therefore partially explained by active equity issuance policies.

Lastly, we show that the effects of the NID on financing are important for large standalone firms, and not only for subsidiaries of multinational corporations (MNCs). To document these effects, we rely on both direct and indirect measures of MNC or group affiliation; we show these results by focusing on the entire sample, or by restricting the analysis to the subsample of firms with negligible financial income, a key potential tool to minimize taxes in this setting. In other words, while group firms or subsidiaries of multinational firms are uniquely situated to benefit from the NID, these firms do not explain the results of this paper.

Overall, our results demonstrate that tax policies designed to encourage the use of equity financing are likely to lead to more capitalized firms. Relative to the existing literature, the results we present are unique for at least four reasons.

First, they reflect the consequences of introducing a novel tax tool explicitly aimed at reducing the debt bias of corporate taxation. Most existing evidence relies on relatively small changes in corporate tax rates whose effects on financing are arguably less salient for economic agents, relative to a direct equity deduction.

Second, the NID tax reform alleviates concerns that changing macroeconomic or fiscal conditions affect the estimates of the impact of taxes on capital structure. The introduction of the NID followed an independent ruling by the European Union directed to ending an advantageous

tax regime favoring the treasury centers of multinational corporations; [2] it was not enacted to address changing macroeconomic conditions or a domestic fiscal challenge. By examining the impact of a tax reform whose timing was triggered by non-domestic fiscal forces, we present arguably cleaner variation on the effect of taxes on capital structure decisions.

Third, the magnitude in the time-series variation in the tax treatment of equity relative to debt is significantly larger, and arguably cleaner from the tax perspective, than previously analyzed tax reforms. An important challenge in the literature is finding settings where the relative taxation of debt changes substantially while other tax margins are left unaffected. Unfortunately, most significant tax reforms also affect the corporate tax base, which introduces biases in the estimated coefficients (Kawano and Slemrod, 2012). Alternatively, relatively minor tax reforms may not trigger substantial financing responses, even when these effects are important in practice. Given that the NID drastically changes the tax financing incentives, and its introduction did not coincide with significant variation in other tax provisions, the tax reform that we analyze overcomes these challenges.

Fourth, we provide the first estimates to date of the impact of a major tax reform on the financing decisions of a sample of firms that is representative of an entire economy. Previous studies have mostly concentrated in analyzing the effect of taxes on the financing decisions of publicly traded firms. To the extent that taxes have heterogeneous effects on firms, as we show in this paper, extending the analysis to the broader set of firms, allows us to sharpen our understanding of the impact of taxes on capital structure decisions.

The rest of the paper is organized as follows. Section I describes the NID program and places both the reform and the paper in the context of the existing literature. Sections II and III introduce the empirical strategy and describe the data, respectively. Section IV presents the results linking the NID to higher capitalization ratios. Section V concludes.

I. The Notional Interest Deduction Reform

I. A. What Triggered the Introduction of the NID?

In 1982, Belgium introduced an advantageous tax legislation designed to attract the investment of multinational corporations (MNCs). This so-called "coordination centers" (CCs)

[2] EC decision on the special tax schemes in Belgium, the Netherlands, and Ireland, February 18, 2003.

regime sought to attract subsidiaries whose sole purpose was to provide financial, accounting, and administrative services to their parent companies.

The taxable income of coordination centers was based on a fixed percent (4% to 10%) of expenses less financial and salary costs; it was not based on profits. As such, profitable treasury centers with minor cost structures faced low effective tax rates. CCs also received preferential dividend and interest income taxation. Not surprisingly, CCs became popular tax destinations for a significant number of multinational firms (Meyers and Verhaeghe, 1991).

In 2003, however, the European Commission (EC) ruled that coordination centers were contrary to the European Union's rules on state aid. CCs provided favorable tax advantages to multinationals that were not available to all Belgian firms. As a direct consequence of this ruling, no new CCs were permitted and existing CCs were progressively phased out.[3] The end of this advantageous tax regime implied the potential loss of these treasury centers.

Facing this potential threat, the tax authorities and the business community, designed a notional interest deduction plan aimed at eliminating financing distortions. The NID allows firms to deduct from their taxable profit, a notional charge equal to the product of the firms' equity times the average rate on the 10-year government bond.[4] Hence, the reform implies that firms whose rate of return on equity is below or equal to the NID rate face a zero corporate tax rate, while those with higher rates of return are only taxed on the extent to which these returns exceed this threshold. The NID became effective starting in 2006. Since then, its basic features have remained in place, with limited changes in two recent tax reforms in 2010 and 2012.

I. B. The Notional Interest Deduction in Practice

The NID is applicable to all firms incorporated in Belgium as well as foreign branches of companies incorporated in Belgium, with the exception of a limited number of firms already benefiting from other advantageous tax regimes.[5]

Some important features of the NID include:

[3] Following several legal disputes, coordination centers were allowed to continue their activity until 2010.
[4] For example, if the 10-year government bond was 4%, a firm with €100,000 in equity would benefit from a €4,000 reduction in taxable income. See http://www.presscenter.org/fr/pressrelease/20041223/conseil-des-ministres-du-23-d%C3%A9cembre-2004-0, for the press release outlining the main elements of the NID, and http://minfin.fgov.be for a current description of the program.
[5] Previously recognized coordination centers are not eligible to use the NID. Multinational firms, however, are not prohibited from creating new subsidiaries to benefit from the NID program.

a. Adjustments. The equity qualifying for the NID deduction is composed of statutory equity and retained earnings, adjusted to limit tax abuses. Participation in companies other than portfolio investments, holdings of shares of investments firms, own shares held on the balance sheet, as well as the value of foreign establishments and real estate are excluded from qualifying equity.[6] Tax-exempt unrealized reevaluation gains are also excluded. Additionally, explicit government subsidies in the form of equity investments are excluded from the NID base.

b. Within year changes in equity. Reductions or increases in equity during a given year result in a NID deduction that is proportional to the time that the relevant equity base was in place. In contrast, profits generated during the fiscal year and that are incorporated into equity at the end of the year are not eligible for the concurrent tax year.

c. Investment or reserve requirements. There are no investment requirements, i.e., firms can claim the NID even if they do not invest at all. Similarly, there are no minimum reserve requirements that a firm needs to meet in order to be eligible to claim these deductions.

d. Carry-forwards. If the NID exceeds the value of taxable profits, the surplus does not generate a refundable credit. However, this surplus can be carried forward for up to 7 years.[7]

e. Rates. The notional interest rate was 3.442% for the 2006 accounting year, and 3.781%, 4.307%, 4.473%, 3.80%, and 3.485 %, respectively, for years 2007 to 2011.[8] The limits to the NID were recently revised. Starting in 2012, the interest rate deduction is capped at 3%.

The introduction of the NID coincided with the elimination of a 0.5% tax on new equity issuance. The abolition of this one-time charge made equity even more attractive after 2006. Yet, the importance of this latter change is minor relative to the recurrent tax benefits from the NID.

I. C. Special Measures Affecting Small Firms and Compensating Tax Measures

The NID included a number of provisions that treat small firms differentially. For example, the new regime provides an additional 0.5% interest deduction for small firms.[9] Yet,

[6] In 2012, the European Commission requested Belgium to repeal the exclusion of foreign establishments and real estate holdings from the NID formula. See: http://europa.eu/rapid/press-release_IP-12-61_en.htm.
[7] The deferred tax benefit from carry-forward provisions is not recorded on the firm's balance sheet. Hence, the existence of deferred NID balances does not mechanically affect the composition of the firms' capital structure.
[8] Faced with the budgetary consequences of the financial crisis, the Belgian government capped the NID rate at 3.8% for both 2010 and 2011. If the initial NID formula had been applied, the 2011 NID rate would have been 4.1%.
[9] Small firms are defined as organizations with fewer than 100 employees that do not exceed more than one of the following thresholds: (a) revenue of €7.3 million, (b) total assets of €3.65 million, or (c) 50 employees.

despite having a higher statutory rate available for deduction, the net effect of the NID reform on small firms' financing incentives is relatively more intricate than for other firms.

A number of concurrent compensating measures aimed at offsetting the estimated budgetary costs of the NID program made increasing equity less attractive for small firms relative to others. These measures included: (a) the elimination of a tax incentive that favored the use of equity financing before the NID was introduced, and (b) the requirement that NID users could no longer rely on the preexisting "untaxed investment reserve" (UIR) program.

The former measure granted a one-time tax credit to firms that before 2006 increased their equity base beyond the highest level in the preceding three years. The credit received was 7.5% of the equity increase, capped at €19,850. This nominal limit made equity more attractive for smaller firms, making the incremental effect of the NID arguably less powerful for them.

The UIR program allowed firms to deduct from taxable income a share of their investments as long as they were funded with retained earnings. The maximum yearly deduction allowed was €18,750. Hence, firms with large equity bases benefited by adopting the NID. In contrast, small firms under the UIR program with little or no tax obligations faced weaker incentives, if any, to tilt their capital structure towards equity financing after 2006.

Taken together, these measures indicate that the NID provided stronger incentives to use equity financing for larger corporations, an issue we will explore in the empirical tests.[10]

I. D. Previous Empirical Evidence

The NID constitutes the broadest implementation to date of an "allowance for corporate equity" (ACE) system (Boadway and Bruce, 1984; Bond and Devereux, 1995), which seeks to achieve tax neutrality in financing decisions. Tax advocacy groups, such as the Institute for Fiscal Studies (IFS, 1991 and 2011), have long stressed the benefits of ACE systems.

Before Belgium, Austria, Brazil, Croatia, and Italy experimented with tax reforms that include features of an ACE. Analyzing the impact of these reforms has, however, been difficult

[10] The combined limit of these two deductions was €38,600. Assuming a 3% NIR rate, firms with equity values of at least €1.3 million would gain by increasing their equity ratios under the NID (€3.9 million in assets using the sample mean equity ratio). In the analysis, we use a size threshold of €5 million to make sure that we capture firms that benefit from using the NID. Using alternative size thresholds to identify large firms does not affect the results.

due to several challenges.[11] All countries, except Brazil, abandoned their ACE a short period after it was enacted. The benefit of the ACE was very restricted (Italy), limited to new equity (Austria), or conditioned on payouts to shareholders (Brazil). Additionally, the evaluation of these reforms suffered from the lack of large datasets, frequent and concurrent changes in other taxes (e.g., Italy), and the absence of control groups to credibly establish the tax effects.

The evidence to date using the passage of the Belgian NID points to mixed results. Using a sample of 614 small firms, Van Campenhout and Van Caneghem (2012) show that the NID did not affect their financing decisions. Conversely, Kestens, et al. (2012) use a non-random sample of 13,130 firms and cross-sectional specifications to show that the NID significantly affected the leverage decisions of small firms. Given the previously discussed tax incentives, the mixed evidence on the effects of the NID on small Belgian firms is hardly surprising. In concurrent and independent work, Princen (2012) uses a subset of Belgian firms, and argues empirically that the NID led Belgian firms to reduce their leverage ratios, relative to firms in France. An important concern, however, is that the NID effects reported in her analysis are driven by a combination of (a) an unusual increase in leverage in her sample of French firms of nearly 4 percentage points in 2006 alone, and (b) a secular trend towards lower leverage of Belgian firms that starts in 2001 and which is not shared by France; both are difficult to rationalize if French and Belgian firms in her sample are comparable absent the NID reform.[12]

Besides the important controversy on whether the NID led to a causal effect on financing, to this date, we know little about whether the potential NID effects are driven by tax avoidance strategies of multinationals,[13] by changing leverage ratios of incumbent or new firms, by changes in equity and/or liabilities or are simply the result of differential industry trends in Belgium.

Beyond this specific setting, there is a large literature examining the effect of taxes on financing decisions (Graham 2008). Yet, although taxes are central to corporate finance analyses, showing that tax rates affect capital structure decisions has been difficult for at least two reasons:

[11] See Klemm (2006) for a review of these experiences and the related literature.
[12] See Figure 1, pp. 8 in Princen (2012). These trends are not present in the universe of firms (our sample), which suggest that they are driven by sampling, survivorship biases, or changes in coverage in her data.
[13] Numerous tax avoidance schemes by large multinationals have been documented by the Belgian media. See, for example, http://www.lalibre.be/actu/belgique/article/760015/bernard-arnault-beneficie-des-largesses-fiscales-belges-depuis-4-ans.html

First, the majority of preexisting studies employ purely cross-sectional (and non-statutory) variation in tax rates or cross-country tax rates, to estimate the effect of taxes.[14] A common shortcoming of such empirical tests is that omitted variables that are difficult to control for at the firm or country level, and not taxes, may explain the results in those papers.

Second, studies that rely on changing tax rates typically face two challenges: (a) finding tax reforms that generate substantial variation in tax incentives, and (b) controlling for time trends.[15] Most tax-based empirical tests to date have found insignificant effects on capital structure. For example, Graham (1999) finds no evidence that changing tax rates affects firms' financing decisions. More recently, Faccio and Xu (2012) find that changing tax rates affect leverage ratios but only for firms located in OECD countries with low rates of tax evasion.

In concurrent work, Heider and Ljungqvist (2012) seek to overcome these challenges by exploiting changes in corporate tax rates across U.S. states. Their empirical test uses variation in state tax rates and relies on non-reform states to control for concurrent trends. They find that tax increases (decreases) lead to higher (unchanged) leverage ratios.

In sum, the introduction of the NID allows us to build on and extend this literature in several unique dimensions. First, by examining the impact of a tax reform that was triggered by non-domestic fiscal conditions (i.e. the European Commission's ruling) we present arguably cleaner variation in tax incentives. Second, by focusing on a tax reform that generated stark changes in tax incentives, we can assess whether the previously shown insignificant results are explained by noisy tax incentives or demonstrate that taxes are indeed irrelevant for financing decisions. Moreover, by exploiting a novel subsidy that is targeted to equity, we can investigate to what extent capital structure would change if firms faced similar tax incentives for debt and equity financing independently of changes in the corporate tax rate. This margin is thus far unexplored in the empirical literature. Third, by relying on a number of clear and economically

[14] For example, Mackie-Mason (1990) finds significant tax effects when focusing on firms' incremental financing decisions as a function of non-interest tax shields. Graham (1996) shows a positive correlation between cross-sectional tax rates and changes in debt ratios. Rajan and Zingales (1995) and Desai, et al. (2004), find that cross-country variation in tax rates has predictive power in explaining financing decisions, among many others.

[15] For example, the Tax Reform Act (TRA) of 1986 coincided with the leverage buyout (LBO) wave of the 1980s. While the TRA led to optimally lower leverage ratios from the tax perspective, it is plausible that the LBO wave led to higher target leverage ratios, making the net effect undetermined. More generally, tax reforms are typically triggered by changing macroeconomic conditions, complicating inference.

compelling control groups, we can greatly overcome the concern that aggregate trends affect our tax estimates. Fourth, our empirical setting allow us to disentangle the tax responses that result from international tax avoidance strategies by multinationals from the direct capital structure responses of standalone firms. Fifth, we provide the first estimates to date of the impact of changing tax incentives on the financing decisions of the universe of firms of an entire economy. Previous studies have mostly concentrated in analyzing the effect of taxes on the capital structure decisions of publicly traded firms. Lastly, we can also relax the assumption that firm-level observations are independent within tax reform. A major concern with tax-based "natural experiment" studies is that the standard errors are understated because the source of variation used is at the tax jurisdiction level, not at the firm level, as it is implicitly assumed in most papers in the literature. In the next section, we describe our empirical strategy designed to identify the arguably causal effect of the NID on financing decisions.

II. Empirical Strategy

As discussed in the preceding section, a common approach to examining the effect of corporate taxes on capital structure is to use cross-sectional specifications that compare leverage ratios (book or market leverage) as a function of tax-related variables. For example:

$$y_{it} = \alpha + \beta CIT_{it} + \psi_{\chi} X_{it} + \varepsilon_{it} \qquad (1)$$

where y_{it} is firm value, CIT_{it} is a variable that captures the tax-driven incentives to use leverage, and X_{it} captures a series of firm or industry variables that shape financing decisions. If leverage responds to the provisions of the tax code, we would expect β to be positive and significant. (1) above provides consistent estimates of the effect of taxes on leverage decisions whenever cross-sectional variation in tax characteristics is uncorrelated with other unobservable determinants of capital structure, such as firm profitability, asset tangibility, etc.

Unfortunately, such an assumption is unlikely to hold empirically. For example, cross-sectional differences in CIT_{it} may result from differences in tax loss carry-forwards (TLCF). TLCF are determined by firms' historical operating performance: firms with weaker (stronger) operating profitability are more (less) likely to possess substantial non-interest tax shields than other firms, which translate into lower (higher) CIT rates. The challenge is that profitability is

likely to affect leverage through other channels. As a result, β would capture the joint effect of profitability and taxes. More generally, whenever differential corporate tax rates are endogenously determined, β is prone to identification challenges.

In this paper, we exploit plausibly exogenous time-series variation in the tax rules affecting capital structure resulting from the NID. If tax provisions meaningfully affect financing decisions, we would expect that the introduction of the NID after 2006 would lead to an increase in the share of equity in the capital structure. Formally:

$$y_{it} = \alpha + \gamma NID_{it} + \psi_{\chi} X_{it} + \varepsilon_{it}. \quad (2)$$

If NID_t captures the new tax provision favoring equity financing, we expect γ to be positive (negative) and significant if y_{it} is the equity (leverage) ratio of firm i at time t. Given the tax incentives discussed in Section I, we expect γ to be economically and statistically significant.[16]

In terms of inference, γ captures both the within-firm and the cross-sectional variation in leverage decisions that result from firms' entry and exit decisions. We further disentangle these two effects by investigating whether: (a) incumbent firms actively rebalance their capital structure using fixed effects specifications, and (b) new firms rely more heavily on equity after 2006. An added advantage of introducing firm fixed-effects in (a) is that they allow us to rule out the confounding effect of time-invariant firm traits.

An important challenge to previously described empirical strategy is that while the NID reform is plausibly exogenous, other concurrent aggregate events can potentially complicate inference. To the extent that aggregate characteristics or investment opportunities vary around the introduction of the NID, γ in (2) would also be biased.

We address this concern in six different ways:

First, we examine the capital structure of Belgian firms relative to those firms located in Belgium's neighboring countries. Using these geographically close and economically integrated firms as controls is attractive because they are exposed to industry and aggregate shocks similar

[16] Given the complexities of the tax incentives for smaller firms, we expect γ to be economically and statistically significant for large firms. In our empirical tests, we use small firms as a within Belgium control group for the effect of the NID on capital structure. This test is attractive because it allows us to difference out the effect of within Belgium time trends. The disadvantage is that it is difficult to argue that large and small firms are exposed to similar investment opportunities. We address this concern by using firms from Belgium's neighboring countries as controls.

to those experienced by the Belgian firms.[17] Formally, we estimate the effect of the NID using a differences-in-differences (DiD) methodology, using the following specification:

$$y_{ikt} = \alpha + \theta NID_{kt} + d_t + d_k + \psi_\chi X_{ikt} + \varepsilon_{ikt} \quad (3)$$

where *i* indexes firms, *k* indexes countries, and *t* indexes time. Country categorical variables (d_k) allow us to control for fixed differences across countries, and time dummies (d_t) control for aggregate trends. The NID dummy variable is a time and country interaction equal to one for Belgian firms after 2006, zero otherwise. We expect θ to be positive and significant. Furthermore, we establish the credibility of the identifying assumption of this test by estimating placebo treatment effects for several years prior to the NID reform, which allow us to establish whether Belgian firms' leverage ratio tracked that of their neighbors before the reform.

Second, we provide a tighter test of (3), above, by limiting the analysis to firms located within 100, 250 and 500 kilometers of the Belgian border.[18] Intuitively, the closer the firms are to the Belgian border, the more likely that the Belgian and control firms are comparable. Alternatively, to address the concern that the results may capture the result of an economic or policy shock in one of the control countries, we examine whether the results change whenever we remove from the control group firms from one of the neighboring countries at a time.

Third, we solely compare the capital structure decisions of Belgian firms with those that share a common cultural heritage (Guiso, et al. 2009). Belgium is multilingual and is located in the intersection of German and Latin cultures.[19] Hence, we assess the effects of the NID using separate specifications for firms located in French and non-French speaking regions.

Fourth, to assess whether specific industries exhibit differential time trends that would otherwise be captured by the DiD estimates, we expand (3) above to include separate year effects for each industry.[20] These tests are important because the Belgian and control countries do not necessarily specialize in the same industries. Hence, showing the robustness of the results to

[17] As part of the European Union, Belgium abolished all trade tariffs and controls at its borders. In 2009, the top three destinations of Belgian exports were Germany (20%), France (18%), and the Netherlands (12%). Luxembourg ranked among Belgium's top 10 trading partners. Source: Belgian Agency for Foreign Trade (www.abh-ace.be).

[18] We use the firms' business addresses to approximate their locations, and rely on Vincenty (1975) for computing geodesic distances to the Belgian border.

[19] http://www.belgium.be/en/about_belgium/government/federale_staat/.

[20] Two-digit Standard Industrial Classification (SIC) codes. The results are robust to using the European NACE industry classification system, as well as, allowing for more disaggregated levels of industry-year controls.

these added controls would reject the idea that the NID effects are explained by a potential composition bias from industry specific shocks.

Fifth, to address the concern that Belgian and control firms may not be identical in terms of observable traits, and that these differences can explain different trends over time, we implement a matching DiD strategy (Heckman, *et al*., 1997). To this end, we replicate the DiD tests on a subsample of matched firms based on pre-NID characteristics.[21]

Sixth, to address the concern that the standard errors in tax reform studies are understated, in some specifications we cluster them at the country level. This correction allows us to relax the assumption that firm observations are independent within each country.[22]

Beyond these tests, a potential concern is whether any tax effects reported may only capture the responses of multinational firms. To test whether the NID effects are widespread to standalone firms, we use direct and indirect proxies for multinational or group firm status.

III. Data Description

III. A. Firm Data

We obtain yearly financial data for the universe of limited liability firms in Belgium from 1996 to 2009 from the Central Balance Sheet Office at the National Bank of Belgium (NBB). All firms, public and privately-owned, are required to file annual financial information to the NBB.[23] The quality of the Belgian data is likely to be high.[24]

In terms of disclosure, large firms are required to file detailed financial statements, while small firms only report selected financial information.[25] All firms report the value of total assets,

[21] See Appendix A2 for a detailed description of the matching procedure.
[22] Given that clustered standard errors only converge to the true standard errors as the number of clusters increase, in Table A1 in the Appendix we also show DiD specifications using data from all European firms included in Amadeus (38 control countries), and report standard errors clustered at the country and industry level (286 clusters).
[23] The majority of firms are private. The number of Belgian non-financial, non-utility firms with common stock in the NYSE Euronext market is small (89 firms). Source: https://europeanequities.nyx.com/, consulted 10/10/2012.
[24] Failing to file and misreporting financial statements results in significant fines levied by the NBB, as well as potential penalties under civil law. Moreover, failure to report as well as misreporting is a criminal offense. In addition, the vast majority of filing is done electronically, and the NBB performs automatic checks aimed at assuring the integrity and quality of the data. Lastly, large firms are required to appoint a statutory auditor and submit audited financial statements to the NBB. See www.nbb.be/pub/home.htm for a description of the data and of Belgian legal requirements. The financial reports are freely available at the NBB website.
[25] See http://www.nbb.be/DOC/BA/Models/ENT/2011_C_20111215.pdf for the questionnaire applicable to large firms and http://www.nbb.be/DOC/BA/Models/ENT/2011_A_20111215.pdf for the small firms' format.

equity, and non-equity liabilities, as well as operating and net income. Beyond basic financial data, the NBB also report a number of variables that are designed to track the transactions of firms that are directly controlled, or linked to other businesses through shareholdings or investments. These ownership variables allow us to test for the differential effect of the NID reform on the capital structure of standalone firms.

We obtain firm-level information for firms in France, Germany, Luxembourg, and the Netherlands, from Bureau Van Dijk (BvD)'s AMADEUS database. AMADEUS provides selected balance sheet and income statement information for over 19 million European firms.[26] We extract the financial accounts available for these countries from 2001 to 2009. Given that AMADEUS eliminates from its files firms that cease to operate for three or more years, we rely on historical disks to generate a sample free from survivorship biases.

The coverage and consistency of AMADEUS depends on each country's financial reporting requirements, and on the date at which BvD started assembling its local database. For example, the coverage of the French data is high, as all firms file standardized financials to the authorities, and BvD's coverage is comprehensive even in the early years of the sample. As a result, France has the largest number of firm-years from the four control countries. In contrast, Germany, Luxembourg, and the Netherlands do not have standardized filing forms or systematic disclosure requirements for all private firms. Hence, the coverage of German firms, for example, is less comprehensive, and the number of firms changes drastically during the sample period.

Beyond financial data, we use AMADEUS to construct measures of firms' independence, so that we can classify firms as subsidiaries or as standalone firms. Lastly, we use the firms' postal codes to approximate the distance between each firm location and the closest Belgian border, using geodesic distances (Vincenty 1975).

III. B. Sample Selection

To facilitate the comparison of financial information across years and countries, and to minimize sample selection problems, we focus on the post-2000 period. AMADEUS's coverage

[26] AMADEUS also provides data for Belgian firms. However, we rely on the NBB data for two reasons. First, the NBB data is the primary source of the Belgian AMADEUS data. As a result, the two sources are unsurprisingly overwhelmingly consistent. Second, the NBB dataset includes variables that are not available through AMADEUS.

prior to 2001 is limited relative to subsequent years. Additionally, and as is common in the literature, we omit agricultural, financial and utility firms because they are subject to substantial government regulations.[27] We also exclude firms with missing assets, equity, or profit data.

A concern when analyzing European data is that many firms are extremely small. As a result, their capital structure choices may not be representative of the decisions of larger organizations. To address this concern, we require that the sample firms have at least one year of data with total assets of €1 million or more. In addition, to ensure that the results are not driven by outliers, all ratios are winsorized at the most extreme 1% in either tail of the distribution.

To address the potential bias introduced by the differential changes in coverage across countries, we omit firms that first appear in the data after 2002, but that were not incorporated in their first reporting or prior year. In other words, we retain all newly incorporated firms, but omit from the analysis older organizations that BvD started covering during the sample period.

After applying these selection criteria, we arrive at a sample of 1,988,723 firm-year observations from 314,228 unique firms. On average, we have over six observations per firm.

III. C. Summary Statistics

Table I presents summary statistics for all firms (Column I), and for Belgian and non-Belgian (Columns II and III, respectively) businesses. Data from France, Germany, Luxembourg, and the Netherlands are further shown in Columns IV, V, VI, and VII, respectively.

The average value of assets is €13.4 million, and €12 and 14 million for Belgian and non-Belgian firms, respectively. Looking at capital structure variables, Table I shows that mean equity and net leverage to assets ratios are 31.8% and 51.2%, respectively. Both measures indicate that Belgian firms are slightly less levered than others: equity to assets and net leverage ratios are 33% and 49%, respectively. Belgian firms pay slightly less income tax as a fraction of income than their neighboring firms: average income taxes are 19.4% in Belgium and 20.7% in other countries. In the sections below, we will investigate whether these differences are relative to the introduction of the NID.

[27] Two-digit SIC codes 1 to 9, 60 to 69 and 40 to 49. These industry filters are introduced to prevent changes in local regulations from affecting the estimates. None of the sample selection criteria affect the main results of this paper.

In Table I, we also report the share of firms that are classified as subsidiaries. Subsidiaries are firms that are reported as such by businesses with revenues of at least $1 billion USD in BvD's OSIRIS 2007 or 2010 disks. The highest subsidiary ratios are reported in Luxembourg (14%), the Netherlands (11%), and Germany (10%) and the lowest in Belgium (4%) and France (5%). We also report group firm, a dummy variable equal to one for firms that report related transactions, or indicate that they are part of a group for consolidation purposes.[28] This measure is only available for Belgium. 37% of Belgian firms are reported as group firms.

Table I stresses the low average distance between firms in the control countries and the Belgian border: 344 kilometers or 214 miles, which is comparable to the typical driving distance between Boston and New York City. Such short distances, combined with the common currency and economic policies shared within the European Union, make a compelling case for the close economic integration between Belgian firms and those located in neighboring countries.

Table I highlights the differential coverage of the AMADEUS database in different countries. While we identify 1,213,198 observations from France, we only capture 147,330 observations from Germany, the largest economy in Europe. Moreover, German firms are larger: €30.7 million in assets, while the mean French firm only has €9.5 million. Similarly, 58% (26%) of German (French) firms have assets values that exceed €5 million.

The summary statistics reported in Table I point to several significant cross-sectional differences between Belgian (treated) and non-Belgian (control) firms. These differences motivate the long list of robustness tests described in the empirical strategy section. For our DiD strategy to be valid, however, we only require that the treatment and control firms are comparable around the introduction of the NID.

In Figure 1, we provide striking suggestive evidence that Belgian and control firms are subject to similar economic shocks. Figure 1, Panel A plots the growth in gross domestic product (GDP) for the 2002 to 2009 period for the five countries. Consistent with the idea that these economies are tightly linked, the correlation of GDP growth in Belgium and the control countries is 0.98 for France, 0.92 for Germany, 0.94 for Luxembourg, and 0.93 for the Netherlands. Similarly, Figure 1, Panel B shows the growth in aggregate revenue in the five countries.

[28] In Belgium, this group classification encompasses majority-owned firms, as well as other organizations that are linked to other firms through a substantial equity participation, which includes any stake above the 10% threshold.

Aggregate numbers are computed using a balanced panel between 2001 and 2009. Consistent with the high co-movement in GDP growth, the correlation between revenue growth in Belgium and revenue growth in France, Germany, Luxembourg, and the Netherlands is 0.97, 0.98, 0.83, and 0.83, respectively. These correlations make a compelling case for the use of the neighboring countries as credible controls for time varying business opportunities affecting Belgian firms.

III.D. Corporate and Personal Tax Information

Table II displays the top statutory tax rates on corporate income, dividends, capital gains, and interest income per country. We also report Miller's (1977) measure of the relative tax advantage of debt relative to equity using, alternatively, the dividend income (Column V) and the capital gains tax rate (Column VI) as proxies for the relevant tax on equity.[29]

Table II highlights three issues. First, during the sample period, all countries used corporate income taxes, with rates ranging between 26% and 40%. Second, the tax differences in the incentive to use leverage across countries are largely determined by personal taxation. Third, while no country experienced a drastic overhaul of its tax system, there is a non-negligible amount of variation in corporate and personal tax rates between 2001 and 2009.

To the extent that corporate and personal tax rates affect financing decisions, we expect higher corporate tax rates and Miller ratios to be associated with increases in leverage ratios. In our empirical tests, we include controls for these variables and assess which of them are related to changes in capital structure around the NID introduction.

IV. Equity Subsidies and Capital Structure

This section formally tests for the effect of the NID on capital structure. We proceed in four steps. First, we show the aggregate data and provide univariate tests. Second, we test whether the NID affected the capital structure of firms using a battery of specifications, control groups, and subsamples. Third, we assess whether incumbent or new firms drive the results. Lastly, we investigate whether equity or non-equity liabilities respond to the NID incentives.

[29] In every country, we assume that the highest statutory tax rate is applicable for each source of income.

IV.A. Aggregate Leverage, Differences of Means, Medians, and Differences-in-Differences

As an initial test of the impact of the NID, in Figure 2, Panel A, we plot the aggregate value of equity and non-equity liabilities in Belgium. Aggregate numbers are obtained by adding the values of equity and liabilities of all Belgian firms each year. Similarly, Figure 2, Panel B, shows the corresponding ratio of aggregate equity to liabilities. These figures stress two points. First, equity and non-equity liabilities move in lockstep between 2001 and 2005: the equity ratio stays between 73 and 79% of liabilities each year before 2005. Second, the value of equity suddenly and drastically rises in 2006 and remains at a higher level thereafter. The aggregate value of equity increases by 31% between 2005 and 2006, while liabilities only increase by 9%. In consequence, the equity ratio is 87% in 2006, and exceeds 90% thereafter. In words, Figure 2 shows that the introduction of the NID coincided with a lower leverage ratio for Belgian firms.

In Table III we investigate whether the patterns shown in Figure 2 can be attributable to confounding time-series variables; we do this by comparing the capital structure of Belgian firms to the leverage ratio of businesses in the control countries. Among other variables, changing product or capital market conditions, and not taxes, may have influenced these leverage ratios.

Table III, Panel A, Columns II, IV, and VI show equity to asset ratios for all, Belgian, and control firms, respectively. Before 2006, Belgian firms had equity to assets ratios that did not exceed 33%, but these ratios sharply increased thereafter. Average equity ratios increased by a full percentage point in 2006 alone, rising to 33.8%, and reached 34.5%, 35.1%, and 35.9% in 2007, 2008, and 2009, respectively. In contrast, the equity ratios of the control firms hardly moved (0.1% increase) between 2005 and 2006. The last three years of data, however, show that control firms exhibit a relatively milder increase in equity ratios. This increase is sharper between 2008 and 2009, but it is likely to be driven by attrition, as between 2008 and 2009, the number of reporting firms dropped by 7% (0.8%) in the control (Belgium) countries.

To provide a sharper test of the NID reform, Table III, Panel B collapses the data for the two years immediately before and after it was introduced. Consistent with Figure 1, the equity ratio of Belgian firms significantly increased from 32.6% in 2004 and 2005, to 34.2% in the two subsequent years. More relevantly, the DiD tests shows that the bulk of this increase is not explained by common trends or by a sudden increase in leverage among control firms. Relative

to the control group, Belgian firms observed an increase of 1.2 percentage points in their equity shares, significant at the 1% level. The last row in Panel B shows that the DiD estimates are robust to clustering the standard errors at the country level, which relaxes the assumption that all Belgian observations are independent from each other.

Lastly, in Table III, Panel C, we explore the differences in medians for both Belgian and control firms around 2006. The results confirm that the leverage ratio of Belgian firms declined after 2006, and, notably, that the results are unlikely to be driven by outliers. The median equity to assets ratio of Belgian firms increased by 1.7 percentage points after the NID was introduced. The corresponding DiD estimate is 1.4 percentage points, significant at the 1% level.

Table IV provides a first glimpse at the determinants of the sensitivity of the equity ratios to changing tax incentives. In particular, we assess whether firms of different sizes, ownership characteristics, or ages responded differentially to the NID. We report post-2006 minus pre-2006 differences, difference-in-differences ratios, and DiD ratios using firm fixed effect models, whenever such specifications can be implemented.

In Table IV, Panel A, we classify firms as medium or large whenever total assets exceed €5 (medium) and 25 (large) million, respectively, for at least one year in the sample, and as small otherwise. Table IV shows that across the size distribution, firms increased their reliance on equity capital. The equity share increased by 1.4, 2.5, and 3.6 percentage points, respectively, for small, medium, and large firms, suggesting that the capital structure of large firms responded more aggressively, an issue we investigate further in subsequent sections. In all cases, the increase in equity is significant at the 1% level. As before, the DiD specifications show that these increases are robust to using non-Belgian firms as controls for concurrent time trends.

In Table IV, Panel A, we also present results from firm fixed effects DiD specifications. These tests allow us to assess whether the equity increases are the result of changes in the capital structure of incumbent firms. Interestingly, these estimates show significant across-the-board increases in equity, and confirm the relatively bigger responses of larger firms.

In Table IV, Panels B and C, we show differences of means when we split firms based on ownership characteristics. Panel B (C) shows separate tests for firms grouped by subsidiary (non-subsidiary) status for small (Columns I and III) and medium and large (Columns III and IV)

firms. These tests stress two issues. First, the equity ratios of medium and large firms significantly increased after 2006, irrespective of ownership characteristics. Second, economically, the smallest effects of the NID reform are found for small standalone firms.

In Table IV, Panel D, we focus on new firms, i.e., firms for which the year of their first financials coincide with their incorporation or subsequent year. The DiD estimates highlight two issues. First, equity ratios rise across-the-board and the gains are concentrated in larger firms. Second, the magnitude of the effects is drastically larger: the DiD estimates point to equity ratio increases of at least 20 percentage points for medium and large firms.

Figure 3 provides a graphical illustration of the empirical strategy of this paper focused on the subsample of medium and large firms and plots the estimated coefficient of the interaction between a dummy variable for each of the 2002 to 2009 years, and a dummy variable equal to one for Belgian firms. It shows that large Belgian firms suddenly and significantly increased their equity ratios as the NID was introduced. Figure 3 shows that Belgian firms and year interactions are indistinguishable from zero before 2006, and only become significant thereafter, as the NID became effective. The magnitude of the equity increase is in 3 percentage points range, or 10% relative to pre-2006 equity ratio levels within two years of the reform.

Taken together, the evidence from Figures 2 and 3, and from Tables III and IV, provides compelling evidence that capital structure responds to changing tax incentives. At the aggregate level, equity increases sharply; at the firm level, median equity ratios increase, providing evidence that the effects are widespread. Moreover, we observe larger increases in equity for firms that face relatively lower capital structure rebalancing costs, such as large or new firms, and that size and not ownership characteristics is the most relevant factor for explaining the NID effects. Lastly, the sharp equity increases right around 2006, provides supporting evidence to the idea that the NID had a significant causal effect on capital structure.

IV.B. Pooled Multivariate Specifications

Table V presents pooled multivariate results. In Columns I to III we start by focusing on Belgian firms only and introducing control variables for firm size, profitability, and asset tangibility, as well as industry effects. The results show that the NID led to higher and increasing

equity use after 2005. We also separately report specifications for medium and large (Column II) and small (Column III) firms. As before, we document an across-the-board increase in equity ratios, and larger equity gains for large firms. In each and every year after 2006, the estimated equity increase in small firms is less than 40% of the estimated response of larger corporations.

In Table V, Column IV, we introduce data from the control countries. This permits us to use country and year dummies, tax variables as controls, as well as to report standard errors that are clustered at the country level. To allow small firms to respond differentially to the NID, we estimate separate interaction effects for small firms, small firms and year fixed effects, small Belgian firms, and for small firms in Belgium for each year in the post-2006 period. Hence, the interaction of the post-2006 and Belgium dummy variables captures the response of medium and large firms to the NID.

The results show that after 2006, large Belgian firms significantly increased their equity shares relative to non-Belgian firms and small Belgian businesses. Equity ratios increased by 1.8 to 3.5 percentage points. In terms of other controls, profitability is robustly linked to lower leverage. The impact of size and asset tangibility is not robust. Lastly, the effect of corporate income taxes on leverage is indistinguishable from zero, consistent with preexisting studies.

Table V, Column V further tests for tax effects by adding controls for the yearly values of dividend, and interest tax rates.[30] Interestingly, the results show that higher dividend income taxes are correlated with significantly lower equity ratios. The point estimates indicate that a reduction in dividend tax rates of 10 percentage points is likely to lead to a 1.7 percentage point decline in leverage. The effect of the other taxes is insignificant.

To investigate whether the changes in capital structure due to the NID are widespread, in Table V, we separately investigate the effects of the NID on the subsidiary (Column VI) and non-subsidiary (Column VII) subsamples. The results show that large firms in Belgium, irrespective of their ownership characteristics, reduced their leverage after 2006. The estimated coefficients, however, do indicate that subsidiaries responded more aggressively to the NID: the magnitude of the effect for non-subsidiaries is 35-55% of the subsidiaries' estimates.

[30] Using Miller ratios as control variables instead of the separate corporate, interest, dividend or capital gains tax rates, does not affect the results.

In a similar spirit, in Table V, Columns VIII and IX, we investigate whether an alternative classification of standalone and group firms, which is only available for Belgian firms (group firm variable), affects the results. The results confirm the idea that with the NID, large firms increased their equity ratios irrespective of ownership characteristics.

Lastly, in Table V, Column X, we explore whether allowing for different year effects for different two-digit SIC industries affects the results. Interestingly, the estimates are unaffected. This latter test is attractive because it allows us to rule out the possibility that industry specific shocks that would have affected industries that are over-represented in Belgium drive the results.

Overall, the estimates from Table V show that the capital structure of Belgian firms shifts towards equity after 2006. The estimates indicate equity ratio increases of 3 percentage points within two years of reform. Evaluated at the mean, these effects translate to higher equity ratios of around 10%. Given that the decline in corporate income tax rates that results from the NID is proportional to the ratio of the NID rate to the expected return on equity, and assuming reasonable estimates for the average firm, the results of Table V correspond to an elasticity of equity ratios to corporate income tax rates of 0.25.[31]

IV.C. Robustness Tests

Having shown that capital structure responds to tax incentives, we now provide a battery of robustness tests using different subsamples and specifications.

To further isolate the impact of the NID on financing, in Table VI, we examine whether limiting the set of firms in the control group to those that are likely to be the most comparable to the treated firms, affects the results. In particular, we examine the sensitivity of the results to moving from the entire sample of control firms (Column I), to only firms that are within 500, 250, and 100 kilometers of the Belgian border (Columns II, III, and IV, respectively). We show results for the Belgium and year interactions starting in 2004 for medium and large firms only, and rely on a specification that controls for firm, size, industry and year, country variables, and size and Belgium interactions, as in Table V, Column X.

[31] Assuming that the risk-free and NID rates are identical at 4%, and that the market risk premium is 6%, then the NID deduction is equivalent to a reduction in corporate income tax rates of 40% for a firm with beta equity of one.

Columns I to IV of Table VI demonstrate that large Belgian firms significantly increased their equity ratios after 2006. The estimated increases in equity are in the 1.2 to 3.7 percentage point range, which correspond to increases in equity of 4% to 11%, significant at conventional levels. Furthermore, given the geographic proximity of control and treated firms and the stability of the estimated coefficients across specifications, it is unlikely that the NID estimates are capturing the effect of aggregate economic shocks.

Table VI, Columns V and VI provide alternative counterfactuals using firms that share common cultural roots with those of the main Belgian regions. Column V limits the analysis to firms headquartered in French-speaking locations, while Column VI presents data for firms operating in Germanic (Dutch and German) speaking regions. While the standard errors in Column VI are significantly larger than those in Column V, the results show Belgian firms, irrespective of cultural heritages, reduced their leverage ratios after 2006.

In Table VI, Columns VII to X, we examine the robustness of the results to omitting firm-level observations from one country at a time from the control group: France, Germany, Luxembourg, and the Netherlands (Columns VII, VIII IX, and X, respectively). While the reduction in the number of clusters and observations sometimes reduces the statistical significance of the results, the point estimates are remarkably robust to the choice of control countries. In other words, the results are unlikely to be driven by the control countries.

Arguably the most remarkable result from Table VI is the lack of significance of *any* of the interaction terms between the year and the Belgium dummies before 2006. Moreover, the estimated coefficients of the pre-2006 interactions are, in every case, lower than 1 percentage point in absolute value. Economically, there is no evidence that Belgian firms behaved differentially prior to 2006. In contrast, the interaction of the 2007 year dummy and the Belgium indicator variable is economically large and significant in each of the 10 specifications shown in Table VI. The estimated coefficient is in the 2.4 to 4 percentage points range. These falsification tests bolster the case for the causal interpretation of the NID effects on capital structure.

In Table A1 in the Appendix, we provide a battery of robustness tests using different subsamples and specifications. In every case, we focus on medium and large firms only. As a benchmark for comparison, Column I shows pooled estimates for this subsample, which stresses

the impact of the NID on capital structure. In Columns II and III, we report results for firms for which financial income is a small share of their total income (5 and 1% maximum thresholds, respectively). These results reinforce the idea that tax arbitrage does not explain the results. Columns IV and V, replicate the analysis using a matching DiD estimator (Heckman, *et al*., 1997) for all matched firms, and for the closest 25% of matches. These latter specifications indicate that the results are unlikely to be explained by time-varying heterogeneity due to differential observable characteristics between treatment and control firms. Column VI shows that using all firms in AMADEUS as controls (38 control countries) does not affect the results. Column VII shows that clustering the standard errors at the country and industry level (286 clusters), leaves the results unchanged. The evidence in Columns VI and VII addresses the concern that the significance of the results is explained by potentially understated standard errors due to the number of clusters in the preceding tables. Lastly, Column VIII shows that the results are robust to including an interaction term between each country indicator variable and the year variable to control for potential country-specific time trends.

In Table VII, we investigate the effects of the NID using two alternative outcome variables: (a) net leverage ratios (total non-equity liabilities minus cash and equivalents over assets), and (b) income tax liabilities to earnings ratios. The focus on net leverage is justified because, from a tax perspective, cash has the opposite consequences to leverage: it generates interest income that increases firms' tax obligations. Net leverage captures the net financial gain from the tax perspective. The focus on income tax liabilities is also intuitive: to the extent that the NID materially affected firms, we expect tax liabilities to decline after 2006. If, in contrast, other confounding effects have bolstered the equity ratios, such as higher profits, we would expect Belgian firms to report unchanged or even increased tax liabilities.

The results demonstrate that the net leverage of Belgian firms declined after the NID was introduced. Table VII, Column I reports lower and decreasing leverage ratios starting in 2006; beginning with 2.2 percentage points lower ratios in 2006 and reaching 6.6 percentage points in 2009. Consistent with prior findings that large firms responded more aggressively to the NID, Column II (III) shows that large (small) firms report lower leverage ratios, in the 3.1 to 8.7 (1.7 to 5.3) percentage point range. The DiD estimates (Column IV) reinforce the finding that large

Belgian firms significantly decreased their leverage ratios after 2006. Although the magnitude of the point estimates reported in Table VII is larger than those reported in Table V, the economic magnitude of the effects is similar; they indicate lower leverage ratios in the 5-10% range.

Table VII, Columns V to VIII, reports income tax payment results using specifications analogous to those described for net leverage. The results demonstrate that the NID led to lower tax payments. Column V reports lower tax to earnings ratios for Belgian firms, in the 3.7 to 6.3 percentage points range. Columns II to IV report consistently larger effects in absolute value for larger firms. Column IV shows that these effects were not observed in the control firms. The DiD estimates show that the magnitude of the NID's effects on Belgian firms was -2.2 percentage points in 2006 and reached -6.4 percentage points in 2009. This last estimate implies a drastic decline of 28% in the average tax to earnings ratios of large firms.

Overall, the evidence presented in Tables V to VII demonstrates that the introduction of a tax provision designed to reduce the tax disadvantage of equity relative to debt, led to economically and statistically significant increases in the share of equity in the capital structure. Such increases are robust to the inclusion of a long array of variables that control for firm, industry, time, and country characteristics. We now investigate whether these increases were driven by incumbent or new firms.

IV.D. Disentangling the Capital Structure Responses: Within-firm and New Firm Analysis

In Table VIII, we focus on investigating the determinants of changes in capital structure decisions for incumbent firms. To this end, we rely on firm fixed effects specifications, which isolate within-firm variation in leverage. These specifications are also attractive because they allow us to rule out the confounding effect of time-invariant firm characteristics. To facilitate the comparison with the preceding results, in each column in Table VIII, we report results for specifications identical to those shown in Table V except for the addition of firm fixed effects.

The within-firm analysis stresses five main results. First, Belgian firms report large and significant increases in equity after 2006. Second, larger firms had greater responses to the NID. Third, the DiD estimates reported in Columns IV and V are virtually identical to those reported in Table V. Fourth, while there is evidence that subsidiaries respond aggressively to the NID, there is consistent evidence that large standalone firms also report substantial equity gains after

2006. In other words, large firms irrespective of ownership consistently increased their equity ratios after 2006. Lastly, industry and time specific dummies do not affect the results.

Table VIII also reports a robust and economically strong correlation between profitability and equity ratios. Most specifications show a positive correlation between asset tangibility and leverage: higher fixed asset ratios lead to lower equity ratios. As before, the effect of corporate income taxes on leverage is insignificant at conventional levels and the effect of changing dividend income taxes is negative and significant as predicted from theory.

Table IX focuses on new firms. The results provide evidence that the capital structure of new firms is strongly affected by the tax rules at inception.[32] The evidence stresses four results. First, the share of equity used by new Belgian firms increased significantly after 2006. Second, the responses to the NID are economically larger for new firms, irrespective of size, than for established organizations. Even small new Belgian firms increase their equity shares. Three, the capital structure of new large firms responded more aggressively to the NID incentives than the financing structure of smaller organizations. The increase in the equity to assets ratio is at least 10 percentage points. These effects correspond to increases in the equity share of at least 35%. Fourth, subsidiaries or group firms do not entirely explain the intensity with which new large firms respond to the new tax incentives. Large standalone firms also increase their equity ratios.

Table IX also provides evidence that the incentives from corporate and personal tax rates affect the capital structure decisions of new firms. More generally, the large estimated effects reported for new firms are consistent with the idea that tax effects are more easily identifiable on the subset of firms where active financing decisions have to be made (Mackie-Mason, 1990).

IV.E. Explaining the Increase in Equity Ratios

We now turn to investigate the source of the decrease in leverage ratios. In particular, we analyze whether the higher equity ratios are the result of an increase in equity or a reduction in non-equity liabilities. We also assess whether the increases in equity can be solely explained by higher retention ratios or they alternatively reflect active equity issuance decisions.

Table X presents results for the natural logarithm of equity (Columns I to III), non-equity liabilities (Columns IV to VI) and total assets (VII and VIII). To facilitate inference, Columns I,

[32] In Table IX and due to the lower sample size of new firms, we control for industry effects using 1-digit SIC codes.

II, IV, V, VII and VIII present specifications that do not control for the level of assets, while Columns III and VI do. Columns II, IV, and VIII also include dummies for each industry and year. All specifications include controls for profitability, tangibility, country, time, industry, size, and size and year effects. In the interest of space, we only report the interaction of the post-2006 year and the Belgium indicator variables for medium and large firms.

The results in Table X, Column I show that large Belgian firms exhibit equity levels that exceed control firms by 14.7% in 2006, 20.2% in 2007, 26.5% in 2008, and 27.1% in 2009, all significant at the 1% level.[33] These increases are economically larger than those shown in the preceding sections. Moreover, the estimates allow us to rule out the possibility that the equity gains are entirely driven by the mechanical effect of the NID on profits. Namely, if the NID deduction in 2006 was 3.4% of equity, and firms proceeded to fully retain this additional windfall, we would expect higher equity levels of 3.4% and not 14.7% in 2006, as reported. Column II shows that time-varying industry effects do not affect the estimates. Interestingly, Column III shows that including the natural logarithm of assets as a control, roughly halves the post-2006 estimates. In other words, the NID not only changed the capital structure choices of Belgian firms but also induced these firms to increase their asset base.

Columns IV and V in Table X examine the level of total non-equity liabilities around the introduction of the NID. Remarkably, the estimated coefficients show no evidence that total non-equity liabilities increased after 2006. Each and every one of the year and Belgium post-2006 interactions are insignificant. As expected given our previous results, Column VI shows that the estimated coefficient becomes negative when we include the value of assets as a control. The fact that the total value of assets held by large Belgian firms increased after 2006 is highlighted by the results shown in Table X, Columns VII and VIII. The estimated coefficients indicate effects in the 8 to 11% range for 2006-2007, and in the 12-16% range between 2008 and 2009. Overall, these results show that the higher equity ratios that we document are the result of an increase in the level of equity and not a reduction in non-equity liabilities.

To rule out the possibility that the equity results shown in the preceding analysis are explained by the higher profits generated by the NID, in Table X, Columns IX and X, we present

[33] Table X, Columns I to III, and IX and X report fewer observations whenever the relevant measure is negative.

results using an alternative equity value that is free from the mechanical effect of the NID on equity. Specifically, for each of the years in the post-2006 period we compute an alternative equity value by subtracting the value of net income of the concurrent and any preceding year in the post-2006 period. For example, to compute this modified equity value for 2008, we take the reported equity value at the end of 2008 and subtract the net income values in 2006, 2007 and 2008. We compute this alternative equity value for both treatment and control firms. The results confirm that large Belgian firms increased their equity ratios after 2006. The magnitude of the effects is in the 15% to 28% range, allowing us to rule out that the NID effects are hardwired.

These increases, however, may be explained by either a decrease in payout policies or by active equity issuance decisions. While the data does not allow us to identify dividends or new stock issues, we can reject the null that firms did not issue new equity by showing that profit retention cannot by itself explain the equity gains of Belgian firms after 2006. To this end, in Table X, Columns XI and XII, present a DiD test using the following dependent variable:

$$\frac{\max\left(0, Equity_{i,t} - Equity_{i,t-1} - netincome_{i,t}\right)}{Equity_{i,2005}} \qquad (4)$$

where the numerator is a measure of the increase in equity that cannot be solely explained by retentions, and in consequence, reflects the active new issuance decisions. To report annual percentage increases in equity relative to the pre-NID period, we scale this variable by the level of equity in 2005 for both treatment and control firms. Columns XI and XII show that there was a significant increase in new equity issuance in each year after 2006.

In sum, Table X highlights five results. First, the introduction of the NID is correlated with significant increases in the levels of equity financing. Second, the nominal value of non-equity liabilities remained unchanged. Third, leverage ratios declined as both equity and total assets increased. Fourth, the equity increases exceed the value of the mechanical windfall coming from nominal interest deduction. Hence, the increases in equity values after 2006 must be explained by active changes in financial policies, either dividend payouts or active equity issuance. Fifth, the post-2006 increase in equity was at least partially the result of active equity issuance, and was not solely explained by lower dividend payouts.

V. F. Interpretation

The evidence presented stresses the role that tax policy plays in shaping firms' capital structure. The sharp and significant tax effects we report are at odds with the bulk of the existing empirical studies, which fail to document significant consequences from changing tax incentives on firms' financing decisions (Myers, 1984; Graham, 2008).

In terms of inference, the Belgian NID is unique relative to other important tax reforms in the past, such as the Tax Reform Act of 1986, in that it drastically affected the tax rules governing capital structure *without* introducing the long range of other confounding reforms that commonly preclude econometricians from capturing such effects empirically. Furthermore, the fact that the timing of the NID reform was triggered by a ruling by the European Commission, and was not initiated by challenging macroeconomic or fiscal conditions in Belgium or in the control countries, bolsters the case for the plausibility of the NID as an exogenous source of variation. Moreover, it alleviates concerns that other concurrent trends may explain the findings.

An additional feature of the NID reform that may explain why we report both fast-appearing and substantial financing effects is its simplicity. The tax incentives to rely on equity financing imbedded in the NID are arguably clearer and more salient to owners and managers alike. Intuitively, the higher the equity base, the lower the tax bill. In contrast, to exploit the traditional tax rules favoring debt financing, firms need to borrow money, and commit to making interest payments. As generations of academics and students have learned over the years, the intuition behind Modigliani and Miller's (1958) results may not be easily grasped by non-financial economists.

Lastly, the evidence demonstrates that reducing the tax-driven distortions that favor the use of debt financing leads to more capitalized firms. Advocates of tax neutrality frequently make the case for eliminating the tax deductibility of interest payments as the only viable alternative to eliminate the debt bias in the existing tax systems. Yet, getting rid of this deduction is likely to face substantial opposition by interest groups. Moreover, such proposal is challenging because competing tax jurisdictions offer similar deductions, which reduces the relative attractiveness of those countries or states that eliminate them. The evidence in this paper suggests that a notional interest deduction may be an alternative plan to address these challenges.

V. Concluding Remarks

A central idea in corporate finance is that optimal capital structure should be strategically arranged with the objective of maximizing the after-tax value of cash flows. Despite this, there is scant evidence linking time series variation in tax provisions with changing financing decisions (Myers, 1984; Graham, 2008).

In this paper, we exploit the introduction of the Notional Interest Deduction (NID) in Belgium to identify the effect of taxes on financing decisions. Traditional tax systems allow firms to deduct the value of interest payments but do not permit a similar charge for equity distributions. The objective of the NID reform was to level the financing playing field faced by firms. Since 2006, the NID has allowed Belgian firms to also deduct an interest charge for equity. As a result, and in sharp contrast to traditional tax incentives, firms' marginal financing decisions are provided with a significant tax deduction regardless of their source of financing.

Using the plausibly exogenous variation in the tax treatment of equity relative to debt that results from the NID, and firm level data from Belgium and Belgium's neighboring countries, we demonstrate that capital structure responds drastically to changing tax incentives. We show that both incumbent and new firms increase their equity ratios, and that large existing and new firms are particularly aggressive in responding to the NID incentives. Lastly, we show that these increases in equity are explained by higher equity levels and not by a reduction in non-equity liabilities.

More broadly, the evidence highlights the potential role of fiscal policy in changing the allocation of risk between different firms' stakeholders. By inducing firms to use equity financing, government policies can affect the likelihood that bondholders are repaid in bad states of the economy. To the extent that firm default is associated with significant financial distress or social costs, there is a potential role for fiscal policy to change private incentives at the firm level. Conversely, government interventions that distort financing policies away from debt financing may entail substantial efficiency costs. The recent financial crisis has emphasized the need to understand the importance of both of these economic forces. Our paper contributes to the debate in the literature by demonstrating that tax policy can substantially affect firms' capital structure choices, an issue that to this date has been subject to debate.

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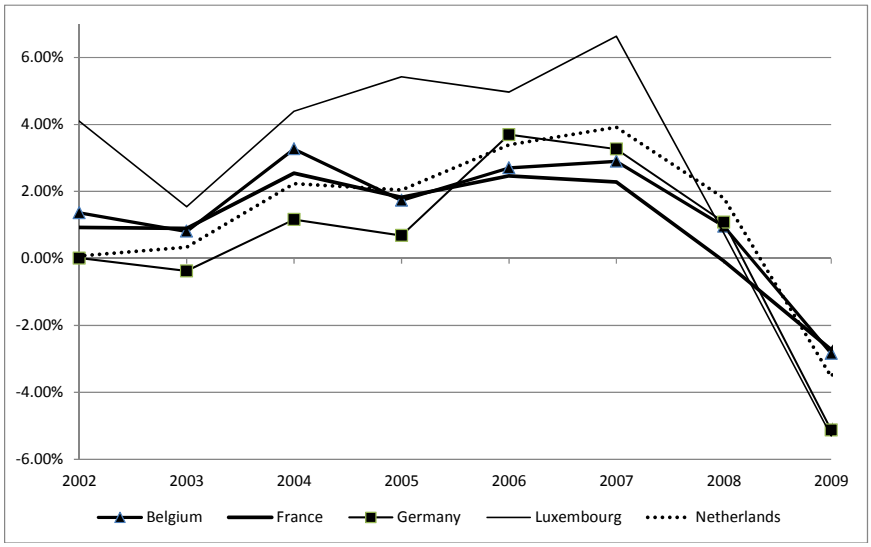
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FIGURE 1.
COMMON TRENDS: BELGIUM, GERMANY, FRANCE, LUXEMBOURG, AND THE NETHERLANDS

These charts stress the tight economic links between Belgium and its four neighboring countries. Panel A shows the rate of growth in gross domestic product (GDP) for Belgium, Germany, France, Luxembourg, and the Netherlands. Data are from the European Commission's Eurostat database (ec.europa.eu/eurostat). Between 2002 and 2009, the correlation coefficient between GDP growth in Belgium and in France, Germany, Luxembourg, and the Netherlands is 0.98, 0.92, 0.94, and 0.93, respectively. Panel B plots the rate of growth in revenue aggregated at the country level for firms in Belgium, Germany, France, Luxembourg, and the Netherlands. The aggregate numbers in Panel B are from a balanced panel of firms with non-missing revenue information for each year between 2001 and 2009. Source: author's calculations based on data from the National Bank of Belgium and Bureau van Dijk's AMADEUS database. Between 2002 and 2009, the correlation coefficient between revenue growth in Belgium and in France, Germany, Luxembourg, and the Netherlands is 0.97, 0.98, 0.83, and 0.83, respectively.

Panel A. GDP Growth



Panel B. Revenue Growth

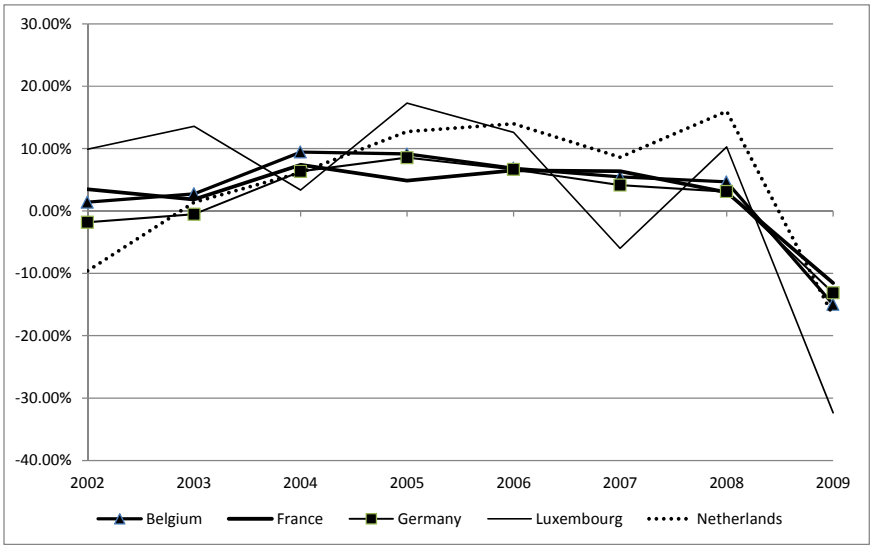
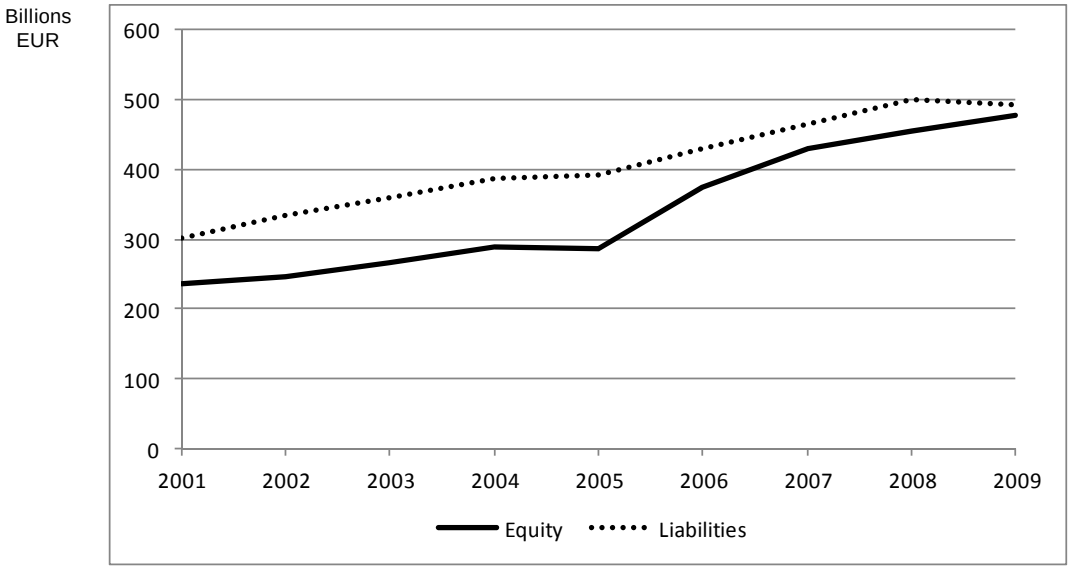


FIGURE 2.
AGGREGATE VALUES OF EQUITY AND TOTAL LIABILITIES IN BELGIUM

This figure plots the annual aggregate value of equity and total liabilities for the sample used in this paper, of Belgium firms between 2001 and 2009. Data are from the National Bank of Belgium's Central Balance Sheet Office's database, which includes selected financial information from all limited liability firms in Belgium. Equity is the book value of shareholders' equity (*capitaux propres*, code 10/15) and total liabilities is the book value of short term and long term liabilities (dettes, code 17/49). Panel A plots nominal values and Panel B the total equity to total liabilities ratio in percent.

A. Nominal Values



B. Aggregate Equity Ratio

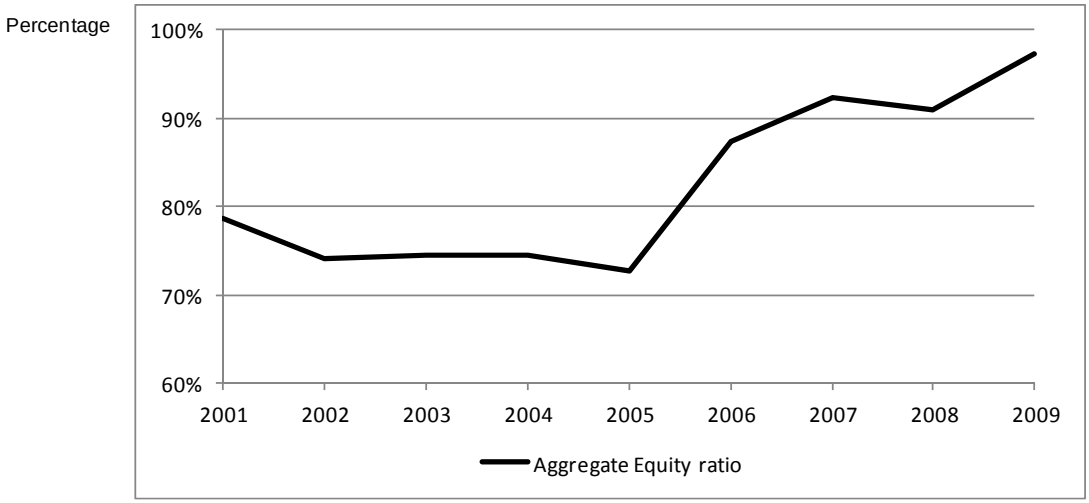
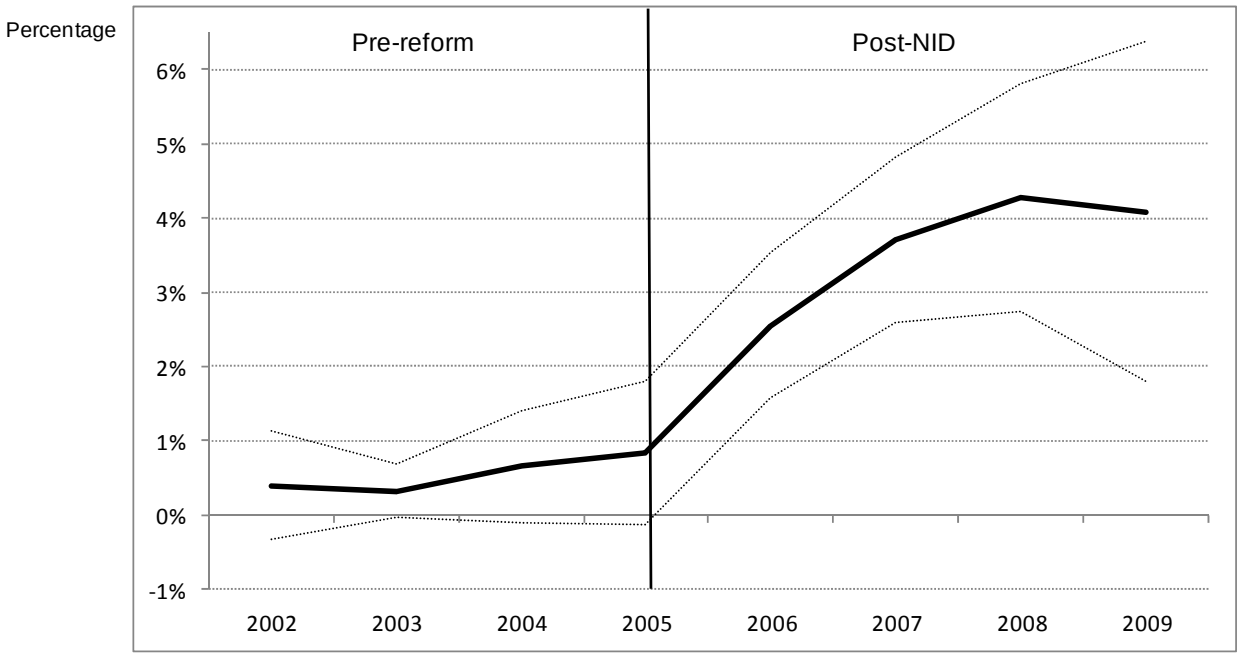


FIGURE 3. IDENTIFICATION STRATEGY

This figure plots the evolution of the average equity to asset ratio of Belgian firms relative to its neighboring countries around the introduction of the NID. The bold line plots the estimated coefficient of the interaction between a dummy variable for each of the years between 2002 and 2009, and a dummy variable equal to one for Belgian firms. The analysis focuses on the sample of firms that had total assets of at least €5 million for at least one year during the sample period, from 2001 to 2009. The estimated coefficients are shown in bold, and the 95% upper and lower standard error bands are plotted using dotted lines. The estimates shown in this figure are obtained using a specification that includes a dummy for each country, to control for time invariant country characteristics, and a dummy for each year, to control for time-varying effects. Standard errors clustered at the country level.



3

TABLE I. SUMMARY STATISTICS

This table shows summary statistics for non-financial, non-utility firms from Belgium, France, Germany, Luxembourg, and the Netherlands from 2001 to 2009. Firm data from Belgium are from the National Bank of Belgium. Firm data from France, Germany, Luxembourg, and the Netherlands are from Bureau van Dijk's (BvD) AMADEUS database. Total assets are in thousands of euros (€). *Equity to assets* is the ratio of the book value of total shareholders' equity to total assets (in percent). *Net leverage* is defined as the value of total (non-equity) liabilities minus cash and cash equivalents over total assets (in percent). *Tax income/EBT* is the ratio of income taxes to pre-tax earnings (in percent). *OROA* is the ratio of operating income (EBIT) to total assets (in percent). *Tangibility* is the ratio of fixed to total assets (in percent). *Subsidiary* is an indicator variable equal to one whenever the sample firm is reported as a subsidiary of a firm with $1b or more in revenue in 2007 and/or 2010, zero otherwise, based on BvD's subsidiary information. *Group firm* is an indicator variable equal to one whenever a Belgian firm reports positive values of receivables or direct and indirect investments with related firms (*entreprises liées*); it is zero otherwise. *Group firm* is not available for non-Belgian firms. *Distance to Belgium* is the geodesic distance (in kilometers) between the firms' postal codes and the geographically closest Belgian postal code. *Assets €5m* (assets €25m) is an indicator variable equal to one for firms with total assets of €5m (€25m) or more for at least one year during the sample period; it is zero otherwise. *New firm* is an indicator variable equal to one for firm-year observations where the year of the first financial statement reported in the data corresponds to the firms' year of incorporation or the subsequent year.

Variables	All	Belgium	Non-Belgium	France	Germany	Luxembourg	Netherlands
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Total assets	13,430	12,007	14,010	9,487	30,701	92,083	70,217
	(489.6)	*(899.2)*	*(583.6)*	*(334.0)*	*(2,039.6)*	*(41,301.9)*	*(13,088.9)*
Equity to assets	31.80	33.26	31.20	32.13	24.87	28.51	27.33
	(0.05)	*(0.12)*	*(0.06)*	*(0.07)*	*(0.16)*	*(0.93)*	*(0.33)*
Net leverage	51.20	49.38	51.95	50.34	62.89	55.01	58.65
	(0.07)	*(0.15)*	*(0.08)*	*(0.09)*	*(0.19)*	*(1.13)*	*(0.39)*
Tax income/EBT	20.31	19.46	20.65	20.48	21.54	16.92	22.77
	(0.03)	*(0.07)*	*(0.04)*	*(0.04)*	*(0.12)*	*(0.56)*	*(0.16)*
OROA	6.45	5.39	6.88	6.77	7.34	6.36	8.31
	(0.02)	*(0.04)*	*(0.03)*	*(0.03)*	*(0.07)*	*(0.35)*	*(0.14)*
Tangibility	30.50	39.57	26.84	26.45	30.77	27.63	24.44
	(0.05)	*(0.11)*	*(0.05)*	*(0.06)*	*(0.15)*	*(0.84)*	*(0.27)*
Subsidiary	0.053	0.040	0.058	0.050	0.100	0.144	0.105
	(0.0004)	*(0.001)*	*(0.001)*	*(0.001)*	*(0.002)*	*(0.013)*	*(0.004)*
Group firm		0.365					
		(0.002)					
Distance to Belgium			343.87	361.37	301.31	20.58	60.17
			(0.50)	*(0.56)*	*(0.95)*	*(0.28)*	*(0.52)*
Assets €5m	0.289	0.235	0.311	0.259	0.584	0.553	0.757
	(0.001)	*(0.002)*	*(0.001)*	*(0.001)*	*(0.003)*	*(0.016)*	*(0.004)*
Assets €25m	0.072	0.058	0.078	0.057	0.202	0.223	0.217
	(0.001)	*(0.001)*	*(0.001)*	*(0.001)*	*(0.003)*	*(0.015)*	*(0.005)*
New firms	0.034	0.029	0.037	0.035	0.049	0.052	0.037
	(0.0001)	*(0.0002)*	*(0.0002)*	*(0.0002)*	*(0.001)*	*(0.003)*	*(0.001)*
Number firm-year obs.	1,988,723	576,050	1,412,673	1,213,198	147,330	4,426	47,719
Number of firms	314,228	78,649	235,579	185,091	38,364	1,192	10,932

TABLE II. CORPORATE AND PERSONAL INCOME TAX RATES

This table shows the maximum statutory corporate and personal income tax rates in Belgium (A), France (B), Germany (C), Luxembourg (D), and the Netherlands (E). Corporate income tax (CIT) rates are shown in Column I. We report the maximum statutory tax rates on dividend income (Column II), interest income (Column III), and capital gains (Column IV). In Columns V, VI, and VII, we report three ratios that seek to capture the Miller (1977) gain from leverage expression:

$$G_L = \left[1 - \frac{(1-\tau_C)(1-\tau_{PS})}{(1-\tau_{PB})}\right]$$

Where τ_C, τ_{PS}, and τ_{PB} are the corporate income tax and personal income tax applicable to income from common stock and bonds, respectively. Miller's ratio 1 (2) assumes that τ_{PS} is the dividend income (capital gains) tax rate. Data are from the OECD (oecd.org/ctp/taxdatabase) and from the tax authorities of the individual countries. When applicable, we show the tax rate applicable to substantial shareholdings.

Country	Year	CIT	Div. Inc.	Int. Inc.	Capital G.	M. Ratio 1	M. Ratio 2
		(I)	(II)	(III)	(IV)	(V)	(VI)
A. Belgium	2001	40.2%	15.0%	15.0%	0.0%	40.2%	29.6%
	2002	40.2%	15.0%	15.0%	0.0%	40.2%	29.6%
	2003	34.0%	15.0%	15.0%	0.0%	34.0%	22.3%
	2004	34.0%	15.0%	15.0%	0.0%	34.0%	22.3%
	2005	34.0%	15.0%	15.0%	0.0%	34.0%	22.3%
	2006	34.0%	15.0%	15.0%	0.0%	34.0%	22.3%
	2007	34.0%	15.0%	15.0%	0.0%	34.0%	22.3%
	2008	34.0%	15.0%	15.0%	0.0%	34.0%	22.3%
	2009	34.0%	15.0%	15.0%	0.0%	34.0%	22.3%
B. France	2001	36.4%	40.1%	25.0%	25.0%	49.2%	36.4%
	2002	35.4%	35.6%	25.0%	25.0%	44.5%	35.4%
	2003	35.4%	33.5%	25.0%	25.0%	42.7%	35.4%
	2004	35.4%	33.9%	26.5%	26.5%	41.9%	35.4%
	2005	34.9%	32.3%	27.0%	27.0%	39.6%	34.9%
	2006	34.4%	32.7%	27.0%	27.0%	39.5%	34.4%
	2007	34.4%	32.7%	27.0%	27.0%	39.5%	34.4%
	2008	34.4%	32.7%	29.0%	29.0%	37.8%	34.4%
	2009	34.4%	32.7%	30.7%	30.7%	36.3%	34.4%
C. Germany	2001	38.9%	25.6%	51.2%	25.6%	6.8%	6.8%
	2002	38.9%	25.6%	51.2%	25.6%	6.8%	6.8%
	2003	40.2%	25.6%	51.2%	25.6%	8.8%	8.8%
	2004	38.9%	23.7%	47.5%	23.7%	11.2%	11.2%
	2005	38.9%	22.2%	44.3%	22.2%	14.7%	14.7%
	2006	38.9%	22.2%	44.3%	22.2%	14.7%	14.7%
	2007	38.9%	23.7%	47.5%	23.7%	11.2%	11.2%
	2008	30.2%	26.4%	47.5%	23.7%	2.1%	-1.5%
	2009	30.2%	26.4%	26.4%	26.4%	30.2%	30.2%
D. Luxembourg	2001	37.5%	21.5%	43.1%	21.5%	13.9%	13.9%
	2002	30.4%	19.5%	39.6%	19.8%	7.2%	7.6%
	2003	30.4%	19.5%	39.6%	19.8%	7.2%	7.6%
	2004	30.4%	19.5%	38.9%	19.5%	8.2%	8.2%
	2005	30.4%	19.5%	38.9%	19.5%	8.2%	8.2%
	2006	30.4%	19.5%	10.0%	19.5%	37.7%	37.7%
	2007	30.4%	19.5%	10.0%	19.5%	37.7%	37.7%
	2008	30.4%	19.5%	10.0%	19.5%	37.7%	37.7%
	2009	28.6%	19.5%	10.0%	19.5%	36.1%	36.1%
E. Netherlands	2001	35.0%	25.0%	30.0%	25.0%	30.4%	30.4%
	2002	34.5%	25.0%	30.0%	25.0%	29.8%	29.8%
	2003	34.5%	25.0%	30.0%	25.0%	29.8%	29.8%
	2004	34.5%	25.0%	30.0%	25.0%	29.8%	29.8%
	2005	31.5%	25.0%	30.0%	25.0%	26.6%	26.6%
	2006	29.6%	25.0%	30.0%	25.0%	24.6%	24.6%
	2007	25.5%	22.0%	30.0%	25.0%	17.0%	20.2%
	2008	25.5%	25.0%	30.0%	25.0%	20.2%	20.2%
	2009	25.5%	25.0%	30.0%	25.0%	20.2%	20.2%

TABLE III. EQUITY SUBSIDIES AND CAPITAL STRUCTURE: MEAN AND MEDIAN ANALYSIS

This table examines the impact of the introduction of the notional interest deduction (NID) tax provision on the capital structure decisions of firms in Belgium using a difference-in-differences (DiD) methodology. Capital structure ratios are computed using the book value of equity to total assets ratio (in percent). The NID became effective in 2006. The capital structure of firms in Belgium (Column IV) is compared to the financing decisions of firms in France, Germany, Luxembourg, and the Netherlands (Column VI, control firms). The number of observations is shown in Columns I (all firms), III (Belgian firms), and V (control firms). Panel A reports average equity to assets ratios. Panel B (C) shows average (median) capital structure ratios for two subsamples: (i) the 2004 to 2005, and (b) the 2006 to 2007 periods, as well as the difference of means (medians) across subsamples. Standard errors are shown in parentheses. Panels A and B report standard errors clustered by firm. The last row in Panel B also reports standard errors for the DiD estimate that are clustered at the country level.

Year	N. Obs.	All Firms	N. Obs.	Belgium	N. Obs.	Control Firms	Difference
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
A. Averages							
All years	1,988,723	31.795	576,050	33.259	1,412,673	31.199	2.061 ***
		(0.054)		*(0.119)*		*(0.059)*	*(0.133)*
2001	156,896	30.924	58,762	31.417	98,134	30.629	0.788 ***
		(0.077)		*(0.142)*		*(0.089)*	*(0.168)*
2002	220,069	30.356	61,086	31.137	158,983	30.056	1.081 ***
		(0.067)		*(0.144)*		*(0.074)*	*(0.162)*
2003	222,180	30.812	62,319	31.816	159,861	30.420	1.396 ***
		(0.068)		*(0.145)*		*(0.076)*	*(0.164)*
2004	225,767	31.247	63,386	32.335	162,381	30.823	1.512 ***
		(0.068)		*(0.145)*		*(0.076)*	*(0.164)*
2005	232,569	31.371	64,374	32.772	168,195	30.834	1.937 ***
		(0.068)		*(0.144)*		*(0.076)*	*(0.163)*
2006	236,872	31.736	66,026	33.759	170,846	30.954	2.805 ***
		(0.068)		*(0.144)*		*(0.075)*	*(0.163)*
2007	236,955	32.338	66,727	34.543	170,228	31.473	3.069 ***
		(0.068)		*(0.144)*		*(0.075)*	*(0.163)*
2008	235,339	32.847	66,953	35.132	168,386	31.939	3.193 ***
		(0.069)		*(0.147)*		*(0.077)*	*(0.166)*
2009	222,076	34.194	66,417	35.875	155,659	33.477	2.398 ***
		(0.074)		*(0.151)*		*(0.083)*	*(0.172)*
B. Before and After Analysis: Means							
2004 to 2005	458,336	31.310	127,760	32.555	330,576	30.829	1.726 ***
(i)		*(0.064)*		*(0.138)*		*(0.071)*	*(0.155)*
2006 to 2007	473,827	32.037	132,753	34.153	341,074	31.213	2.940 ***
(ii)		*(0.064)*		*(0.138)*		*(0.070)*	*(0.155)*
Difference and DiD		0.727 ***		1.598 ***		0.384 ***	1.214 ***
Clustered (firm) standard errors		*(0.046)*		*(0.091)*		*(0.053)*	*(0.105)*
Differences-in-Differences (DiD)							1.214 ***
Clustered (country) standard errors							*(0.151)*
C. Before and After Analysis: Medians							
2004 to 2005	458,336	30.198	127,760	29.982	330,576	30.272	-0.290 **
(i)		*(0.054)*		*(0.107)*		*(0.058)*	*(0.114)*
2006 to 2007	473,827	30.819	132,753	31.664	341,074	30.536	1.129 ***
(ii)		*(0.053)*		*(0.107)*		*(0.057)*	*(0.113)*
Difference and DiD		0.621 ***		1.682 ***		0.263 ***	1.419 ***
		(0.075)		*(0.156)*		*(0.080)*	*(0.160)*

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

TABLE IV. DIFFERENCE-IN-DIFFERENCES: SIZE, OWNERSHIP, AND NEW FIRMS

This table examines the impact of the introduction of the notional interest deduction (NID) tax provision on the capital structure decisions (book value of equity to total assets) of firms in Belgium. The table compares equity to capital ratios in the two years immediately before the reform was approved (2004 and 2005), to the same ratios in the two subsequent years (2006 and 2007). Panel A reports: (a) *Difference*, post-2006 minus pre-2006 differences in the equity ratios of Belgian firms; (b) *DiD Estimates*, difference-in-differences estimates of these ratios using concurrent data from firms in France, Germany, Luxembourg, and the Netherlands as controls; and (c) *DiD Fixed Effects Estimates*, difference-in-differences estimates using the same control group as in (b) and a fixed-effects (firm) specification. Panel B reports: (a) *DiD Estimates,* and (b) *DiD Fixed Effects Estimates*. Panel C reports: (a) *Difference*, and (b) *DiD Fixed Effects Estimates*. Panel D reports: (a) *Difference*, and (b) *DiD Estimates*. In Panel A, sample firms are classified as small (Column I), medium (Column II), and large (Column III), respectively. Firms are classified as medium or large in terms of size whenever total assets exceeded €5m and €25m, respectively, in at least one year in the 2001 to 2009 period; otherwise, they are classified as small. In Panel B, firms are classified as subsidiaries, whenever the sample firm was reported as a subsidiary of a firm with $1b or more in revenue, non-subsidiaries otherwise. In Panel C, firms are classified as group firms whenever a Belgian firm reports transactions with related firms or indicates that it publishes consolidated accounts, non-group otherwise. Group information is not available for non-Belgian firms. In Panel D, a firm is identified as new whenever the year of their first financial statement corresponds to their year of incorporation or the subsequent year. Standard errors (clustered by firm) are shown in parentheses, and the number of firm-years is reported in squared brackets.

	(I)	(II)	(III)	(IV)
Panel A. By Size	**Small**	**Medium**	**Large**	
Difference	1.244 ***	2.491 ***	3.586 ***	
	(0.104)	*(0.212)*	*(0.383)*	
	[199,653]	[45,918]	[14,942]	
DiD Estimates	0.693 ***	2.508 ***	3.288 ***	
	(0.122)	*(0.240)*	*(0.432)*	
	[662,412]	[202,187]	[67,564]	
DiD Fixed Effects Estimates	0.311 ***	1.854 ***	2.974 ***	
	(0.120)	*(0.245)*	*(0.453)*	
	[662,412]	[202,187]	[67,564]	
Panel B. By Subsidiary Status	**Subsidiary**		**Non-Subsidiary**	
	Small	**Med-Large**	**Small**	**Med-Large**
DiD Estimates	4.770 ***	3.802 ***	0.636 ***	2.536 ***
	(1.623)	*(0.604)*	*(0.122)*	*(0.223)*
	[11,562]	[38,137]	[650,850]	[231,614]
DiD Fixed Effects Estimates	2.426	3.805 ***	0.286 **	1.876 ***
	(1.690)	*(0.650)*	*(0.119)*	*(0.228)*
	[11,562]	[38,137]	[650,850]	[231,614]
Panel C. By Group Status	**Group**		**Non-Group**	
	Small	**Med-Large**	**Small**	**Med-Large**
Difference	1.841 ***	2.641 ***	1.012 ***	3.112 ***
	(0.247)	*(0.226)*	*(0.112)*	*(0.362)*
	[51,563]	[42,714]	[148,090]	[18,146]
Difference Fixed Effects Estimates	1.849 ***	2.739 ***	1.449 ***	2.397 ***
	(0.243)	*(0.230)*	*(0.110)*	*(0.366)*
	[51,563]	[42,714]	[148,090]	[18,146]
Panel D. New Firms Only	**Small**	**Medium**	**Large**	
Difference	1.078	17.985 ***	19.212 ***	
	(0.788)	*(2.769)*	*(4.946)*	
	[6,533]	[665]	[245]	
DiD Estimates	2.415 ***	20.471 ***	24.569 ***	
	(0.905)	*(2.983)*	*(5.326)*	
	[27,656]	[3,408]	[1,240]	

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

TABLE V. EQUITY SUBSIDIES AND CAPITAL STRUCTURE: MULTIVARIATE ANALYSIS

This table examines the impact of the introduction of the notional interest deduction (NID) tax provision on the capital structure decisions (book value of equity to total assets) of firms in Belgium. The NID became effective in 2006. Columns I to III and VIII to IX show data from Belgian firms. Columns IV to VII and Column X use firms in France, Germany, Luxembourg, and the Netherlands as controls. All specifications include the following controls: (a) 2-digit SIC code industry dummies (not shown); (b) firms controls: (i) the natural logarithm of total assets as a proxy for firm size, (ii) the ratio of operating income to assets (OROA) as a proxy for firm profitability, and (iii) the ratio of fixed to total assets as a proxy for the tangibility of assets; (c) the interaction between a dummy variable for each of the years from 2006 to 2009 and a dummy variable equal to one for Belgian firms. Columns IV to VII and Column X also include the following controls: (a) a dummy for each country (not shown); (b) *small*, an indicator variable equal to one for firms whose assets were below €5 million in every year of the sample; (c) *small* Belgium*, an interaction of the *small* and *Belgium* dummies; (d) a dummy for each year; (e) an interaction between *small* and a dummy for each year; (f) the interaction between *small*Belgium* and a dummy variable for each of the years from 2006 to 2009; (f) corporate income tax rates: the prevalent rates for each country-year. Columns V to X also include controls for the maximum prevalent dividend and interest income tax rates in each country. In Columns VI and VII, firms are classified as subsidiaries, whenever the sample firm was reported as a subsidiary of a firm with $1b or more in revenue, non-subsidiaries otherwise. In Columns VIII and IX, firms are classified as group firms whenever a Belgian firm reports transactions with related firms or indicates that it publishes consolidated accounts, non-group otherwise. Group information is not available for non-Belgian firms. Column X includes separate dummy variables for each industry and year pairing. Standard errors clustered at the firm (country) level are shown in parentheses in Columns I to III and VIII to IX (Columns II to VIII).

	Dependent Variable: Equity to Assets (%)									
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
*Belgium * 2006*	0.983***	2.017***	0.306***	1.796***	2.053***	4.604***	1.637***	2.027***	0.728*	1.952***
	(0.099)	*(0.205)*	*(0.118)*	*(0.253)*	*(0.278)*	*(0.408)*	*(0.271)*	*(0.302)*	*(0.404)*	*(0.215)*
*Belgium * 2007*	1.396***	2.998***	0.374***	3.060***	3.339***	5.921***	2.910***	2.792***	1.658***	3.217***
	(0.115)	*(0.239)*	*(0.139)*	*(0.314)*	*(0.293)*	*(0.303)*	*(0.291)*	*(0.333)*	*(0.461)*	*(0.218)*
*Belgium * 2008*	2.368***	4.307***	1.083***	3.514***	3.869***	7.162***	3.325***	4.051***	3.291***	3.736***
	(0.128)	*(0.265)*	*(0.155)*	*(0.640)*	*(0.591)*	*(0.701)*	*(0.551)*	*(0.358)*	*(0.508)*	*(0.437)*
*Belgium * 2009*	3.856***	6.184***	2.361***	2.860**	3.147**	8.124***	2.351*	6.136***	4.790***	3.124**
	(0.136)	*(0.280)*	*(0.166)*	*(0.911)*	*(1.009)*	*(0.656)*	*(1.033)*	*(0.374)*	*(0.533)*	*(0.872)*
Ln assets	2.440***	1.896***	4.521***	1.794	1.793	-0.269	2.217*	3.144***	4.065***	1.792
	(0.098)	*(0.189)*	*(0.195)*	*(0.986)*	*(0.986)*	*(1.148)*	*(0.918)*	*(0.203)*	*(0.214)*	*(0.988)*
OROA	69.566***	69.963***	68.475***	72.647***	72.657***	76.588***	72.140***	72.397***	66.561***	72.780***
	(0.868)	*(1.978)*	*(0.950)*	*(5.282)*	*(5.276)*	*(13.496)*	*(4.600)*	*(1.444)*	*(1.123)*	*(5.278)*
Tangibility	1.663***	12.883***	-2.769***	7.263	7.262	22.195***	6.308	11.593***	-5.408***	7.330
	(0.379)	*(0.778)*	*(0.432)*	*(3.479)*	*(3.479)*	*(3.061)*	*(3.315)*	*(0.650)*	*(0.480)*	*(3.538)*
Corporate income taxes				5.628	-3.902	-19.624	-2.189			-2.524
				(6.838)	*(7.571)*	*(18.000)*	*(6.718)*			*(7.278)*
Dividend income taxes					-17.104**	-7.210	-16.238**			-14.547**
					(3.890)	*(16.726)*	*(4.144)*			*(4.480)*
Interest income taxes					1.829	-0.248	1.860			3.143
					(2.135)	*(2.318)*	*(2.163)*			*(1.939)*
Small firm				2.560	2.554	-3.256	2.963*	5.216***	5.704***	2.496
				(1.307)	*(1.302)*	*(2.292)*	*(1.162)*	*(0.570)*	*(0.588)*	*(1.318)*
*Small * Belgian firm*				0.609	0.615	4.379***	0.465			0.660
				(1.086)	*(1.075)*	*(0.229)*	*(1.031)*			*(1.101)*
*Belgium * 2006 * small*				-1.613**	-1.605**	-0.272	-1.267**	-0.657*	-0.415	-1.680***
				(0.396)	*(0.419)*	*(1.283)*	*(0.367)*	*(0.350)*	*(0.395)*	*(0.357)*
*Belgium * 2007 * small*				-2.666***	-2.683***	-0.758	-2.331***	-1.135***	-1.328***	-2.803***
				(0.482)	*(0.498)*	*(0.710)*	*(0.487)*	*(0.405)*	*(0.454)*	*(0.457)*
*Belgium * 2008 * small*				-3.290**	-3.329**	-0.064	-2.906**	-1.123**	-2.287***	-3.475**
				(0.963)	*(0.944)*	*(1.201)*	*(0.892)*	*(0.450)*	*(0.503)*	*(0.911)*
*Belgium * 2009 * small*				-4.107**	-4.072**	1.896	-3.449*	-1.507***	-2.786***	-4.228**
				(1.187)	*(1.309)*	*(1.620)*	*(1.335)*	*(0.483)*	*(0.531)*	*(1.293)*
Country controls	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes
Year controls	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year dummies	No	No	No	No	No	No	No	No	No	Yes
Standard errors (cluster)	Firm	Firm	Firm	Country	Country	Country	Country	Firm	Firm	Country
Observations	570,147	135,096	435,051	1,982,778	1,982,778	104,214	1,878,564	206,240	340,962	1,982,778
Subsample	Belgium All	Belgium Med-Large	Belgium Small	All	All	Subsidiaries All	Non-Subs. All	Group Belgium	Non-Group Belgium	All

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

TABLE VI. CAPITAL STRUCTURE AND TAX INCENTIVES: CHANGING CONTROL GROUPS

This table examines the impact of the notional interest deduction (NID) tax provision on the capital structure decisions of Belgian firms. The NID became effective in 2006. The objective of the analysis is to examine the robustness of the post-2006 increase in the equity ratios of Belgian firms to changing the set of firms that are used as controls. Firms in France, Germany, Luxembourg, and the Netherlands are used as controls. All specifications report results for firms that between 2001 and 2009 had assets of €5m or more for at least one of the sample years. Data are from the National Bank of Belgium (Belgium), and from BvD's AMADEUS (control firms). Column I reports results for all firms. Columns II to IV show results for all firms in Belgium and those in the control countries that are within 500 (Column II), 250 (Column III), and 500 (Column IV) kilometers of the Belgian border. Columns V and VI limit the analysis to firms in Belgium and in the control countries that are located in regions that speak French (Column V), and Dutch or German (Columns VI). Firms located in multilingual cities such as Brussels are included in both groups. Columns VII to X show results that exclude observations from one of the control countries at a time: France (Column VII), Germany (Column VIII), Luxembourg (Column IX), and the Netherlands (Column X). We report estimated coefficients for the interaction between a dummy variable for each of the years from 2004 to 2009 and a dummy variable equal to one for Belgian firms. All specifications include the following controls (estimated coefficients are not shown): (a) the natural logarithm of total assets as a proxy for firm size, (b) the ratio of operating income to assets (OROA) as a proxy for firm profitability, (c) the ratio of fixed to total assets as a proxy for the tangibility of assets; (d) a dummy for each country to control for time invariant country characteristics, (e) a dummy for each year, (f) a dummy for each year and industry pair, and (g) separate controls for each of the following tax rates in each country and year: (i) corporate, (ii) dividend, and (iii) interest income, (h) *small*, an indicator variable equal to one for firms whose assets were below €5 million in every year of the sample; (i) *small* Belgium*, an interaction of the *small* and *Belgium* dummies; (j) a dummy for each year; (k) an interaction between *small* and a dummy for each year; (l) the interaction between *small*Belgium* and a dummy variable for each of the years from 2006 to 2009. Standard errors clustered at the country level are shown in parentheses.

		By Distance to the Belgian Border			By Language Family		Omitting Observations from the Following Countries:			
	All firms	**< 500 kms**	**< 250 kms**	**< 100 kms**	**Romance**	**Germanic**	**France**	**Germany**	**Luxembourg**	**Netherlands**
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
*Belgium * 2004*	-0.245	-0.212	-0.391	-0.525	-0.044	-0.236	-0.238	-0.774	0.028	-0.261
	(0.388)	*(0.395)*	*(0.429)*	*(0.446)*	*(0.070)*	*(0.238)*	*(0.377)*	*(0.572)*	*(0.204)*	*(0.402)*
*Belgium * 2005*	-0.087	-0.048	-0.252	-0.737	0.085	0.144	0.224	-0.647	0.136	-0.116
	(0.410)	*(0.393)*	*(0.408)*	*(0.480)*	*(0.100)*	*(0.379)*	*(0.662)*	*(0.529)*	*(0.335)*	*(0.422)*
Belgium * 2006	**1.859** ***	**1.813** ***	**1.682** **	**1.253** *	**2.112** ***	**2.347** *	**2.359**	**1.619** **	**2.133** ***	**1.821** **
	(0.331)	***(0.362)***	***(0.426)***	***(0.494)***	***(0.107)***	***(0.676)***	***(1.004)***	***(0.490)***	***(0.183)***	***(0.344)***
Belgium * 2007	**3.130** ***	**3.081** ***	**2.892** ***	**2.357** **	**3.083** ***	**3.951** ***	**3.618** **	**2.884** ***	**3.393** ***	**3.096** ***
	(0.318)	***(0.345)***	***(0.380)***	***(0.545)***	***(0.101)***	***(0.355)***	***(0.661)***	***(0.402)***	***(0.194)***	***(0.329)***
Belgium * 2008	**3.677** ***	**3.671** ***	**3.591** ***	**2.360** **	**3.494** ***	**3.677** *	**2.721** *	**3.376** **	**3.884** ***	**3.661** ***
	(0.400)	***(0.480)***	***(0.623)***	***(0.832)***	***(0.065)***	***(0.956)***	***(1.036)***	***(0.750)***	***(0.361)***	***(0.405)***
Belgium * 2009	**3.057** **	**2.996** **	**3.098** **	**1.194**	**2.827** ***	**0.740**	**0.080**	**2.860** *	**3.445** **	**3.033** **
	(0.819)	***(0.942)***	***(1.081)***	***(1.551)***	***(0.103)***	***(0.504)***	***(1.126)***	***(1.079)***	***(0.635)***	***(0.847)***
Observations	1,982,778	1,619,570	1,246,887	730,096	1,413,274	569,504	769,580	1,835,490	1,935,059	1,978,352

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

TABLE VII. NET LEVERAGE AND TAX LIABILITIES

This table examines the impact of the introduction of the notional interest deduction (NID) tax provision on the capital structure and tax obligations of Belgian firms. The dependent variables are: (1) net leverage to total assets: the value of total liabilities minus cash and cash equivalents over total assets (Columns I to IV), and (2) Income taxes/EBT: the ratio of income taxes to pre-tax earnings (Columns V to VIII). Columns I to III and V to VII show results for firms from Belgium only. Columns IV and VIII also include firms located in France, Germany, Luxembourg, and the Netherlands, which are used as controls for concurrent time trends. Columns I, IV, V, and VIII report results for all sample firms. Columns II and VI show results for firms whose assets exceed €5 million in at least one year of the sample, while Columns III and VI limit the analysis to firms whose assets were below €5 million in every year of the sample. All specifications include the following controls: (a) 2-digit SIC code industry dummies; (b) firms controls: (i) the natural logarithm of total assets as a proxy for firm size, (ii) the ratio of operating income to assets (OROA) as a proxy for firm profitability, and (iii) the ratio of fixed to total assets as a proxy for tangibility of assets; (c) the interaction between a dummy variable for each of the years from 2006 to 2009 and a dummy variable equal to one for Belgian firms; (d) a dummy for each year. Columns IV and VIII also include the following controls: (a) a dummy for each country; (b) *small*, an indicator variable equal to one for firms whose assets were below €5 million in every year of the sample; (c) *small* Belgium*, an interaction of the *small* and *Belgium* dummies; (d) an interaction between *small* and a dummy for each year; (e) the interaction between *small*Belgium* and a dummy variable for each of the years from 2006 to 2009; (f) separate controls for each of the following tax rates in each country and year: (i) corporate income, (ii) dividend income, and (iii) interest income; and (f) separate dummy variables for each industry and year pairing. We report the following estimated coefficients (all others are not shown): (1) the interaction between a dummy variable for each of the years from 2006 to 2009 and a dummy variable equal to one for Belgian firms, (2) the estimated coefficients for each of the tax variables, and (3) the interaction of the *Belgium* dummy, the *small* dummy, and a dummy variable for each of the years from 2006 to 2009. Standard errors clustered at the firm (country) level are shown in parentheses in Columns I to III and V to VII (Columns IV to VIII).

	Dependent Variables							
	Net-leverage				**Income Taxes to Earnings Before Taxes**			
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
*Belgium * 2006*	-2.257 ***	-3.146 ***	-1.685 ***	-2.948 ***	-3.688 ***	-3.993 ***	-3.735 ***	-2.206 *
	(0.122)	*(0.250)*	*(0.145)*	*(0.295)*	*(0.136)*	*(0.271)*	*(0.157)*	*(0.828)*
*Belgium * 2007*	-3.036 ***	-4.479 ***	-2.150 ***	-4.745 ***	-4.707 ***	-5.937 ***	-4.538 ***	-4.230 ***
	(0.141)	*(0.291)*	*(0.170)*	*(0.305)*	*(0.135)*	*(0.263)*	*(0.157)*	*(0.345)*
*Belgium * 2008*	-4.189 ***	-5.785 ***	-3.122 ***	-5.330 ***	-5.325 ***	-7.192 ***	-5.029 ***	-5.586 ***
	(0.156)	*(0.319)*	*(0.190)*	*(0.650)*	*(0.142)*	*(0.277)*	*(0.166)*	*(0.211)*
*Belgium * 2009*	-6.629 ***	-8.715 ***	-5.332 ***	-4.269 **	-6.302 ***	-8.307 ***	-6.012 ***	-6.434 ***
	(0.167)	*(0.336)*	*(0.203)*	*(1.164)*	*(0.142)*	*(0.273)*	*(0.166)*	*(0.199)*
Corporate income taxes				-0.852				54.323 ***
				(4.445)				*(6.320)*
Dividend income taxes				8.326				27.282 ***
				(9.625)				*(5.795)*
Interest income taxes				-4.635 *				-2.227 *
				(2.053)				*(0.996)*
*Belgium * 2006 * small*				1.927 **				0.330
				(0.600)				*(0.488)*
*Belgium * 2007 * small*				3.239 ***				1.542 ***
				(0.611)				*(0.067)*
*Belgium * 2008 * small*				3.748 **				2.586 ***
				(1.227)				*(0.296)*
*Belgium * 2009 * small*				4.771 **				2.501 ***
				(1.620)				*(0.475)*
Country controls	No	No	No	Yes	No	No	No	Yes
Year controls	No	No	No	Yes	No	No	No	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year dummies	No	No	No	No	No	No	No	No
Standard errors (cluster)	Firm	Firm	Firm	Country	Firm	Firm	Firm	Country
Observations	570,147	135,096	435,051	1,982,778	560,808	132,691	428,117	1,965,575
Subsample	Belgium All	Belgium Med-Large	Belgium Small	All	Belgium All	Belgium Med-Large	Belgium Small	All

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

TABLE VIII. WITHIN-FIRM VARIATION IN CAPITAL STRUCTURE DECISIONS

This table examines the impact of the introduction of the notional interest deduction (NID) tax provision on the capital structure decisions (book value of equity to total assets) of firms in Belgium using fixed effects (firm) specifications. The NID became effective in 2006. Columns I to III and VIII to IX show data from Belgian firms. Columns IV to VII and Column X use firms in France, Germany, Luxembourg, and the Netherlands as controls. All specifications include the following controls: (a) firms variables: (i) the natural logarithm of total assets as a proxy for firm size, (ii) the ratio of operating income to assets (OROA) as a proxy for firm profitability, and (iii) the ratio of fixed to total assets as a proxy for the tangibility of assets; (b) the interaction between a dummy variable for each of the years from 2006 to 2009 and a dummy variable equal to one for Belgian firms. Columns IV to VII and Column X also include the following controls: (a) *small*, an indicator variable equal to one for firms whose assets were below €5 million in every year of the sample; (b) the interaction between *small*Belgium* and a dummy variable for each of the years from 2006 to 2009; (c) corporate income tax rates: the prevalent rates for each country-year; (d) a dummy for each year; (e) an interaction between *small* and a dummy for each year; (f) *small* Belgium*, an interaction of the *small* and *Belgium* dummies. Columns V to X also include controls for the maximum prevalent dividend and interest income tax rates in each country. In Columns VI and VII, firms are classified as subsidiaries whenever the sample firm was reported as a subsidiary of a firm with $1b or more in revenue, non-subsidiaries otherwise. In Columns VIII and IX, firms are classified as group firms whenever a Belgian firm reports transactions with related firms, non-group otherwise. Group information is not available for non-Belgian firms. Column X includes separate dummy variables for each industry and year pairing. Standard errors clustered at the firm (country) level are shown in parentheses in Columns I to III and VIII to IX (Columns II to VIII).

	Dependent variable: Equity to Assets (%)									
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
*Belgium * 2006*	2.178 ***	2.705 ***	1.998 ***	1.765 ***	2.063 ***	3.992 ***	1.709 ***	3.386 ***	4.170 ***	1.903 ***
	(0.097)	*(0.199)*	*(0.111)*	*(0.297)*	*(0.322)*	*(0.235)*	*(0.331)*	*(0.285)*	*(0.376)*	*(0.319)*
*Belgium * 2007*	3.076 ***	3.921 ***	2.799 ***	2.774 ***	3.040 ***	5.640 ***	2.592 ***	4.479 ***	5.315 ***	2.793 ***
	(0.119)	*(0.241)*	*(0.137)*	*(0.423)*	*(0.480)*	*(0.322)*	*(0.494)*	*(0.320)*	*(0.430)*	*(0.448)*
*Belgium * 2008*	4.154 ***	5.138 ***	3.836 ***	3.265 ***	3.451 ***	7.195 ***	2.861 **	5.715 ***	6.642 ***	3.192 ***
	(0.137)	*(0.273)*	*(0.158)*	*(0.544)*	*(0.612)*	*(0.263)*	*(0.627)*	*(0.351)*	*(0.468)*	*(0.535)*
*Belgium * 2009*	5.451 ***	6.841 ***	5.006 ***	2.919 **	3.243 ***	7.906 ***	2.500 **	7.581 ***	7.917 ***	3.060 ***
	(0.147)	*(0.288)*	*(0.171)*	*(0.731)*	*(0.646)*	*(0.411)*	*(0.642)*	*(0.368)*	*(0.490)*	*(0.543)*
Ln assets	0.266	-0.028	0.376 *	-1.312	-1.314	-2.734	-1.176	1.207 ***	-0.260	-1.346
	(0.184)	*(0.323)*	*(0.224)*	*(0.802)*	*(0.802)*	*(1.610)*	*(0.699)*	*(0.312)*	*(0.255)*	*(0.800)*
OROA	40.576 ***	47.036 ***	39.009 ***	46.292 ***	46.293 ***	62.020 ***	45.218 ***	44.977 ***	37.648 ***	46.442 ***
	(0.629)	*(1.554)*	*(0.688)*	*(3.695)*	*(3.698)*	*(11.130)*	*(3.205)*	*(1.047)*	*(0.836)*	*(3.686)*
Tangibility	-11.231 ***	-6.816 ***	-12.734 ***	-6.248 *	-6.250 *	0.357	-6.691 *	-7.272 ***	-13.779 ***	-6.222 *
	(0.478)	*(0.955)*	*(0.552)*	*(2.792)*	*(2.792)*	*(2.986)*	*(2.738)*	*(0.816)*	*(0.611)*	*(2.734)*
Corporate income taxes				-1.735	-8.104	-26.619	-6.275			-7.400
				(6.625)	*(5.304)*	*(16.538)*	*(4.267)*			*(5.286)*
Dividend income taxes					-18.026 **	-3.180	-18.790 **			-17.283 **
					(5.880)	*(10.336)*	*(5.745)*			*(6.004)*
Interest income taxes					-3.723 *	1.306	-4.408 **			-3.526 *
					(1.473)	*(2.896)*	*(1.256)*			*(1.338)*
*Belgium * 2006 * small*				-1.817 ***	-1.850 ***	-1.949 ***	-1.504 ***	-0.320	-0.598 *	-1.937 ***
				(0.238)	*(0.228)*	*(0.163)*	*(0.238)*	*(0.308)*	*(0.356)*	*(0.206)*
*Belgium * 2007 * small*				-2.762 ***	-2.777 ***	-2.596 ***	-2.349 ***	-0.709 *	-0.857 **	-2.846 ***
				(0.390)	*(0.393)*	*(0.303)*	*(0.409)*	*(0.364)*	*(0.407)*	*(0.371)*
*Belgium * 2008 * small*				-3.520 ***	-3.529 ***	-3.202 ***	-2.997 ***	-0.791 *	-1.102 **	-3.605 ***
				(0.524)	*(0.543)*	*(0.301)*	*(0.551)*	*(0.407)*	*(0.443)*	*(0.496)*
*Belgium * 2009 * small*				-4.256 ***	-4.422 ***	0.541	-3.811 ***	-1.223 ***	-1.260 ***	-4.510 ***
				(0.693)	*(0.624)*	*(0.561)*	*(0.614)*	*(0.438)*	*(0.470)*	*(0.552)*
Year controls	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes
Industry-year dummies	No	No	No	No	No	No	No	No	No	Yes
Standard errors (cluster)	Firm	Firm	Firm	Country	Country	Country	Country	Firm	Firm	Country
Observations	570,147	135,096	435,051	1,982,778	1,982,778	104,214	1,878,564	206,240	340,962	1,982,778
Subsample	Belgium All	Belgium Med-Large	Belgium Small	All	All	Subsidiaries All	Non-Subs. All	Group Belgium	Non-Group Belgium	All

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

TABLE IX. EQUITY SUBSIDIES AND THE CAPITAL STRUCTURE OF NEW FIRMS

This table examines the impact of the introduction of the notional interest deduction (NID) tax provision on the capital structure decisions (book value of equity to total assets) of new firms in Belgium. The NID became effective in 2006. A firm is identified as new whenever the year of their first financial statement corresponds to their year of incorporation or the subsequent year. Columns I to III and VIII to IX show data from Belgian firms. Columns IV to VII and Column X use firms in France, Germany, Luxembourg, and the Netherlands as controls. All specifications include the following controls: (a) 1-digit SIC code industry dummies (not shown); (b) firms controls: (i) the natural logarithm of total assets as a proxy for firm size, (ii) the ratio of operating income to assets (OROA) as a proxy for firm profitability, and (iii) the ratio of fixed to total assets as a proxy for the tangibility of assets; (c) the interaction between a dummy variable for each of the years from 2006 to 2009 and a dummy variable equal to one for Belgian firms. Columns IV to VII and Column X also include the following controls: (a) a dummy for each country (not shown); (b) *small*, an indicator variable equal to one for firms whose assets were below €5 million in every year of the sample; (c) *small* Belgium*, an interaction of the *small* and *Belgium* dummies; (d) the interaction between *small*Belgium* and a dummy variable for each of the years from 2006 to 2009; (e) corporate income tax rates: the prevalent rates for each country-year; (f) a dummy for each year; (g) an interaction between *small* and a dummy for each year. Columns V to X also include controls for the maximum prevalent dividend and interest income tax rates in each country. In Columns VI and VII, firms are classified as subsidiaries whenever the sample firm was reported as a subsidiary of a firm with $1b or more in revenue, and as non-subsidiaries otherwise. In Columns VIII and IX, firms are classified as group firms whenever a Belgian firm reports transactions with related firms, and as non-group otherwise. Group information is not available for non-Belgian firms. Column X includes separate dummy variables for each industry and year pairing. Standard errors clustered at the firm (country) level are shown in parentheses in Columns I to III and VIII to IX (Columns II to VIII).

	Dependent Variable: Equity to Assets (%)									
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
*Belgium * 2006*	2.850 ***	7.035 ***	2.992 ***	14.252 ***	15.076 ***	9.179 ***	15.546 ***	2.254	13.262 ***	14.296 ***
	(0.803)	*(2.718)*	*(0.804)*	*(0.880)*	*(0.953)*	*(1.668)*	*(0.858)*	*(4.627)*	*(2.518)*	*(1.134)*
*Belgium * 2007*	4.083 ***	11.155 ***	3.432 ***	19.044 ***	19.991 ***	12.259 **	20.610 ***	11.350 ***	15.718 ***	18.108 ***
	(0.861)	*(2.234)*	*(0.877)*	*(1.785)*	*(1.531)*	*(3.025)*	*(1.659)*	*(3.992)*	*(2.466)*	*(1.984)*
*Belgium * 2008*	2.103 **	7.864 ***	2.960 ***	16.842 ***	18.324 ***	16.920 **	18.383 ***	13.155 ***	15.518 ***	16.857 ***
	(0.909)	*(2.682)*	*(0.906)*	*(1.209)*	*(1.312)*	*(3.840)*	*(1.172)*	*(4.404)*	*(2.850)*	*(1.545)*
*Belgium * 2009*	1.582	5.812 **	4.703 ***	10.948 ***	11.582 ***	36.960 **	9.796 ***	10.421	12.365 ***	9.948 ***
	(1.128)	*(2.914)*	*(1.189)*	*(1.726)*	*(2.193)*	*(10.428)*	*(1.778)*	*(7.294)*	*(3.366)*	*(1.836)*
Ln assets	-0.297	6.226 ***	-4.324 ***	-5.020 **	-5.022 **	-7.009 **	-5.005 ***	-0.182	-3.400 ***	-5.048 **
	(0.234)	*(0.715)*	*(0.302)*	*(1.094)*	*(1.093)*	*(2.048)*	*(0.939)*	*(0.715)*	*(0.298)*	*(1.102)*
OROA	49.553 ***	30.894 ***	52.160 ***	57.210 ***	57.214 ***	82.598 **	56.945 ***	74.197 ***	48.914 ***	57.313 ***
	(1.862)	*(9.212)*	*(1.880)*	*(4.653)*	*(4.646)*	*(21.000)*	*(4.155)*	*(5.757)*	*(1.895)*	*(4.655)*
Tangibility	3.857 ***	18.643 ***	3.568 ***	5.866 ***	5.856 ***	19.343 **	5.788 ***	17.042 ***	4.106 ***	5.951 ***
	(0.760)	*(2.303)*	*(0.775)*	*(0.789)*	*(0.777)*	*(4.223)*	*(0.692)*	*(2.371)*	*(0.792)*	*(0.696)*
Corporate income taxes				13.413	-19.131	1.578	-17.664			-11.062
				(22.045)	*(23.366)*	*(46.340)*	*(21.286)*			*(19.412)*
Dividend income taxes					-51.553 *	-70.661	-50.037 *			-47.246
					(21.690)	*(67.862)*	*(20.204)*			*(22.355)*
Interest income taxes					11.531 *	61.497	8.257 *			12.906 **
					(4.741)	*(30.224)*	*(3.273)*			*(4.354)*
Small firm				-18.161 ***	-18.170 ***	-20.407 **	-16.587 ***	-12.678 ***	-9.589 ***	-18.257 ***
				(1.773)	*(1.772)*	*(4.544)*	*(1.354)*	*(2.556)*	*(1.067)*	*(1.758)*
*Small * Belgian firm*				1.807 *	1.860 *	-0.525	1.871 *			1.910 *
				(0.821)	*(0.769)*	*(1.004)*	*(0.815)*			*(0.843)*
*Belgium * 2006 * small*				-11.374 ***	-11.302 ***	-3.592	-11.858 ***	-5.750	-12.088 ***	-11.160 ***
				(0.623)	*(0.567)*	*(2.610)*	*(0.360)*	*(5.672)*	*(2.586)*	*(0.621)*
*Belgium * 2007 * small*				-16.722 ***	-16.757 ***	-17.978 **	-17.399 ***	-12.207 **	-14.538 ***	-16.351 ***
				(0.948)	*(0.690)*	*(4.284)*	*(0.736)*	*(4.924)*	*(2.551)*	*(0.821)*
*Belgium * 2008 * small*				-15.024 ***	-15.259 ***	6.874 **	-15.680 ***	-14.112 **	-14.591 ***	-15.677 ***
				(0.379)	*(0.360)*	*(2.315)*	*(0.380)*	*(5.897)*	*(2.924)*	*(0.339)*
*Belgium * 2009 * small*				-7.453 **	-6.903 *	-13.869	-5.386 *	-5.033	-9.973 ***	-6.896 *
				(2.127)	*(2.635)*	*(23.262)*	*(2.270)*	*(8.464)*	*(3.503)*	*(2.858)*
Country controls	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes
Year controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year dummies	No	No	No	No	No	No	No	No	No	Yes
Standard errors (cluster)	Firm	Firm	Firm	Country	Country	Country	Country	Firm	Firm	Country
Observations	16,518	1,898	14,620	68,141	68,141	2,868	65,273	2,140	14,378	68,141
Subsample	Belgium All	Belgium Med-Large	Belgium Small	All	All	Subsidiaries All	Non-Subs. All	Group Belgium	Non-Group Belgium	All

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

TABLE X. EXPLAINING THE INCREASE IN EQUITY RATIOS

This table examines the separate contribution of equity, total liabilities, and total assets in explaining the decline in equity to assets ratios of large Belgian firms after 2006. The dependent variables are: (a) *Ln Equity*, the natural logarithm of the book value of shareholders equity (Columns I to III), (b) *Ln Total Liabilities*, the natural logarithm of the nominal value of total liabilities (Columns IV to VI), (c) *Ln Total Assets*, the natural logarithm of the nominal value of total assets (Columns VII and VIII), (d) *Ln Alternative Equity*, the natural logarithm of the book value of an alternative measure of shareholders equity (Columns IX and X). Alternative equity excludes the effect of net income after 2006 on the total value of equity. Hence, alternative equity is equal to equity from 2001 to 2005; equity minus net income for 2006; equity minus net income for 2007 and 2006 for 2007, etc. The idea behind this alternative measure is to exclude the direct contribution of the notional interest deduction on net income and equity and focus on changes in equity that are not driven by retained earnings. (e) *Outside Equity*, which is a lower bound of the annual amount of equity from raised externally (Columns XI and XII). Outside equity is computed using the following formula: max(0,year-on-year change in equity - net income for the year) divided by the level of equity in 2005. To report annual percentage increases in equity relative to the pre-NID period, we scale this variable by the level of equity in 2005 for both treatment and control firms. The analysis includes firms from Belgium (treatment), France, Germany, Luxembourg, and the Netherlands (controls). We report estimated coefficients for the interaction between a dummy variable for each of the years from 2006 to 2009, and a dummy variable equal to one for Belgian firms. Additionally, all specifications include the following controls (estimated coefficients are not shown): (a) the ratio of operating income to assets (OROA) as a proxy for firm profitability, (b) the ratio of fixed to total assets as a proxy for the tangibility of assets; (c) a dummy for each country to control for time invariant country characteristics, (d) a dummy for each year, (e) small, an indicator variable equal to one for firms whose assets were below €5 million in every year of the sample, (f) small* Belgium, an interaction of the small and Belgium dummies, (g) the interaction between small*Belgium and a dummy variable for each of the years from 2006 to 2009, and (h) separate controls for each of the following tax rates in each country and year: (i) corporate, (ii) dividend, and (iii) interest income. Columns I, IV, and VII also include industry (2-digit SIC) controls, and Columns II, III, V, VI, VIII, IX, and X, include separate year effects for each industry. The reported estimated coefficients correspond to large Belgian firms in the post-2006 period. Large firms are firms that between 2001 and 2009 had assets of €5m or more for at least one of the sample years. Clustered (country) standard errors are shown in parentheses.

	Dependent Variable											
	Ln Equity			***Ln Total Liabilities***			***Ln Total Assets***		***Ln Alternative Equity***		***Outside Equity***	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)	(XI)	(XII)
Belgium * 2006	**0.147** ***	**0.146** **	**0.073** **	**-0.007**	**-0.004**	**-0.083** ***	**0.078** *	**0.080** *	**0.261** ***	**0.193** **	**0.045** ***	**0.045** ***
	(0.030)	***(0.032)***	***(0.022)***	***(0.034)***	***(0.033)***	***(0.005)***	***(0.030)***	***(0.029)***	***(0.027)***	***(0.049)***	***(0.0029)***	***(0.0028)***
Belgium * 2007	**0.202** ***	**0.196** ***	**0.097** **	**-0.040**	**-0.040**	**-0.143** ***	**0.102** **	**0.109** **	**0.223** ***	**0.153** **	**0.021** ***	**0.020** ***
	(0.036)	***(0.039)***	***(0.021)***	***(0.027)***	***(0.026)***	***(0.007)***	***(0.030)***	***(0.028)***	***(0.025)***	***(0.049)***	***(0.0035)***	***(0.0035)***
Belgium * 2008	**0.265** ***	**0.253** ***	**0.129** ***	**-0.056**	**-0.060**	**-0.184** ***	**0.123** *	**0.135** **	**0.267** ***	**0.170** **	**0.012** **	**0.011** *
	(0.052)	***(0.054)***	***(0.018)***	***(0.053)***	***(0.052)***	***(0.008)***	***(0.048)***	***(0.047)***	***(0.021)***	***(0.038)***	***(0.0036)***	***(0.0040)***
Belgium * 2009	**0.271** ***	**0.259** ***	**0.115** **	**-0.047**	**-0.055**	**-0.198** ***	**0.143** ***	**0.157** ***	**0.282** ***	**0.157** ***	**0.017** ***	**0.016** ***
	(0.024)	***(0.024)***	***(0.031)***	***(0.030)***	***(0.030)***	***(0.013)***	***(0.022)***	***(0.020)***	***(0.023)***	***(0.014)***	***(0.0024)***	***(0.0024)***
Ln assets as control	No	No	Yes	No	No	Yes	No	No	No	Yes	No	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	-	-	Yes	-	-	Yes	-	Yes	Yes	Yes	Yes
Industry-year dummies	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
Standard errors (cluster)	Country	Country	Country	Country	Country	Country	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,835,150	1,835,150	1,835,150	1,982,701	1,982,701	1,982,701	1,982,778	1,982,778	1,697,669	1,697,669	1,486,907	1,486,907

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

APPENDIX A1. ALTERNATIVE ROBUSTNESS TESTS

This table examines the impact of the introduction of the notional interest deduction (NID) tax provision on the capital structure decisions (book value of equity to total assets) of firms in Belgium using alternative subsamples and estimation techniques. The NID became effective in 2006. All the specifications in this table are estimated on the subsample of firms with total assets of €5m or more for at least one year during the sample period. Column I show the benchmark results from a multivariate-pooled OLS specification. Columns II and III restrict the analysis to firms with financial to total revenue shares that during the sample period are lower than 5% and 1%, respectively. Financial to total revenue shares are computed as the ratio of: (i) the sum of financial revenue for all years in the sample, to (ii) the sum of operating revenue (sales) and financial revenue during the same period. Column IV shows the result from a matching difference-in-differences estimator as explained in Appendix A2. Column V reports results from the same matching estimator as in Column IV but limits the analysis to the closest 25% of the observations in the treatment and control countries in terms of the matching distance. Column VI applies the same specification as Column I but uses data from all 39 countries in the AMADEUS database. Column VII reports the same estimated coefficients as those in Column I, but presents country and industry (two-digit SIC) level clustered standard errors (286 clusters). Column VIII is similar to Column I but adds an interaction between a dummy for each country and the year variable to control for country-specific time trends. Except in Column IV and V, all specifications include the following controls: (a) an interaction between a year fixed effect and the 2-digit SIC code industry dummies; (b) firms controls: (i) the natural logarithm of total assets as a proxy for firm size, (ii) the ratio of operating income to assets (OROA) as a proxy for firm profitability, and (iii) the ratio of fixed to total assets as a proxy for the tangibility of assets; (c) the interaction between a dummy variable for each of the years from 2006 to 2009 and a dummy variable equal to one for Belgian firms (the only reported coefficients), (f) corporate income, dividend and interest income tax rates: the prevalent rates for each country-year. Standard errors in Columns I to III, VI and VIII are clustered at the country level. Standard errors in Columns IV and V are clustered at the control firm level, while those reported in Column VII are clustered at the country and industry (two-digit SIC) level. Standard errors are shown in parentheses.

	Benchmark Specification	**Fin. Share < 5%**	**Fin. Share < 1%**	**Matching Estimator**	**Matching Close Match**	**All Countries Europe**	**Country-SIC2 Clusters**	**Country Trend**
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
*Belgium * 2006*	2.069 ***	1.888 ***	2.057 ***	1.813 ***	1.851 ***	2.750 ***	2.069 ***	2.135 ***
	(0.319)	*(0.441)*	*(0.466)*	*(0.374)*	*(0.548)*	*(0.323)*	*(0.268)*	*(0.382)*
*Belgium * 2007*	3.380 ***	2.760 ***	2.858 ***	2.633 ***	2.968 ***	3.987 ***	3.380 ***	3.367 ***
	(0.257)	*(0.659)*	*(0.723)*	*(0.425)*	*(0.635)*	*(0.335)*	*(0.396)*	*(0.605)*
*Belgium * 2008*	4.268 ***	3.497 ***	3.695 ***	2.677 ***	3.153 ***	4.278 ***	4.268 ***	3.994 ***
	(0.337)	*(0.761)*	*(0.838)*	*(0.474)*	*(0.715)*	*(0.323)*	*(0.430)*	*(0.775)*
*Belgium * 2009*	3.667 ***	3.118 ***	3.621 ***	2.467 ***	2.622 ***	4.184 ***	3.667 ***	3.664 ***
	(0.479)	*(0.982)*	*(1.063)*	*(0.522)*	*(0.821)*	*(0.308)*	*(0.529)*	*(0.968)*
Observations	573,848	428,769	352,248	76,859	19,887	1,862,880	573,848	573,848
R-squared	0.142	0.150	0.153	0.003	0.006	0.105	0.142	0.143

***, **, and * denote significance at the 1, 5, and 10% level, respectively.

APPENDIX A2. MATCHING BELGIAN AND CONTROL FIRMS

The objective of this appendix is to describe the matching difference-in-differences procedure used in the robustness tests reported in table A1. Following Heckman, Ichimura and Todd (1997), we identify firms in the control countries (France, Germany, Luxembourg and the Netherlands) that are comparable to those in Belgium (treated firms) and that are likely to be exposed to similar investment opportunities. We proceed in three steps.

First, to assure that both treatment and control firms are exposed to similar economic shocks, we only search for valid matching firms within each firms' industry (two-digit SIC codes) group.

Second, to identify comparables firms based on observable characteristics, we rely on three control variables that have been shown to affect financing decisions, and that are used as controls throughout the paper. Namely, (i) the natural logarithm of total assets, which proxies for firm size, (ii) OROA, the ratio of operating return on assets, that proxies for firm profitability, and (iii) tangibility, the ratio of fixed to total assets, which proxies for the ease at which assets can be repossessed and redeployed to other uses outside the relevant firm. To make these variables comparable, and to avoid scaling challenges, we normalize each variable to be mean zero and unit variance before matching. More specifically, we match each Belgian firm *i* in our sample with the control firm *j* in the same two-digit industry that minimizes the following distance metric ("*nearest-neighbor matching*"):

$$\left|\overline{\ln(assets)}_j^{01-03} - \overline{\ln(assets)}_i^{01-03}\right| + \left|\overline{OROA}_j^{01-03} - \overline{OROA}_i^{01-03}\right| + \left|\overline{Tang}_j^{01-03} - \overline{Tang}_i^{01-03}\right|$$

where $|\cdot|$ is the absolute value operator and $\overline{\ln(assets)}_k^{01-03}$, $\overline{OROA}_k^{01-03}$ and $\overline{Tang}_k^{01-03}$ are respectively the 2001-2003 normalized average value of the natural logarithm of total assets, the ratio of operating revenue to total assets and the ratio of fixed assets to total assets for firm k. The use of the 2001-2003 average values of the covariates reduces the potential bias caused by temporary idiosyncratic shocks and measurement error. In order to improve the quality of the match, we allow firms in the control country to be matched with more than one Belgian firm (i.e. we match *with* replacement).

Third, the average treatment effect is computed by comparing each Belgian firm *i* with and only with its foreign match j. Specifically, we first estimate the treatment effect $\hat{\theta}_{i,t}$ for each Belgian firm *i* at time *t* by using the following difference-in-differences estimator:

$$\hat{\theta}_{i,t} = \left(y_{i,t} - y_{i,2003}\right) - \left(y_{j,t} - y_{j,2003}\right).$$

where $y_{i,t}$ is the equity ratio of Belgian firm i in year t and $y_{j,t}$ is the leverage ratio in year t of the control firm that was matched with firm i. A consistent estimator of the average treatment effect at time *t* is obtained by taking the sample mean of the individually estimated effects for all Belgian companies: $\hat{\theta}_t = \frac{1}{N}\sum_{i=1}^{i=N} \theta_{i,t}$. Since each firm in the control countries can be matched with more than one Belgian firm, we cluster the standard errors at the control firm level.

The results are robust to modifying the matching procedure to increasing the set of matching covariates (e.g. including firm's age as a control for the firm's life-cycle), varying the matching period (e.g. by only relying in one or multiple years of data in the pre-2006 period), using alternative distance metrics (e.g. squared rather than absolute distances) or matching procedures (i.e. without replacement) to identify the matching firms, using different industry or more disaggregated classification systems (NACE, three digit SIC, etc). Rather than compare each Belgian firm with and only with its matched control, we have also performed multivariate OLS specifications similar to those used in the rest of the paper, on the restricted set of matched companies. The results were unaffected by this change.