



# Taxes and bank capital structure<sup>☆</sup>

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## ABSTRACT

This paper shows that a reduction in tax discrimination between debt and equity funding leads to better capitalized financial institutions. The paper exploits exogenous variation in the tax treatment of debt and equity created by the introduction of a tax shield for equity. The results demonstrate that a more equal treatment of debt and equity increases bank capital ratios, driven by an increase in common equity. The change also leads to a significant reduction in risk taking for ex-ante low capitalized banks. Overall, the findings suggest that tax shields could be a valuable and innovative policy tool for bank regulators.

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## 1. Introduction

This paper investigates whether reducing the relative tax benefit of debt can be a valuable addition to existing bank capital regulation. The 2008–2009 financial crisis spurred both regulators and politicians around the world to rethink bank capital regulation. Ensuring that regulation contributes to proper risk-taking incentives and sufficient loss-absorbing capacity for financial institutions, however, remains a difficult task. This paper focuses on an often

overlooked factor in the regulatory debate on bank capital: tax deductibility of interest expenses on debt. Following up on the seminal work of Modigliani and Miller (1958), both Stiglitz (1973) and King (1974) show theoretically that tax shields have an impact on corporate capital structures and thus ultimately on financial stability. Hence, reducing the unequal tax treatment of debt and equity could be an excellent addition to current capital regulation (Poole, 2009). Studying the direct impact of tax shields on bank capital structure, however, is a complicated task. Corporate tax shields tend to be relatively constant over time and changes to tax rates are more often than not part of a broader tax reform package, which makes it difficult to tease out the direct impact of tax shields. As a consequence, empirical evidence on the relation between tax shields and capital structure is mixed for non-financial corporations<sup>1</sup> and very limited for financial institutions.

To better understand the impact of tax shields on the capital structure decisions of financial institutions, I exploit

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<sup>1</sup> See Graham and Leary (2011) for an excellent overview of the existing capital structure literature.

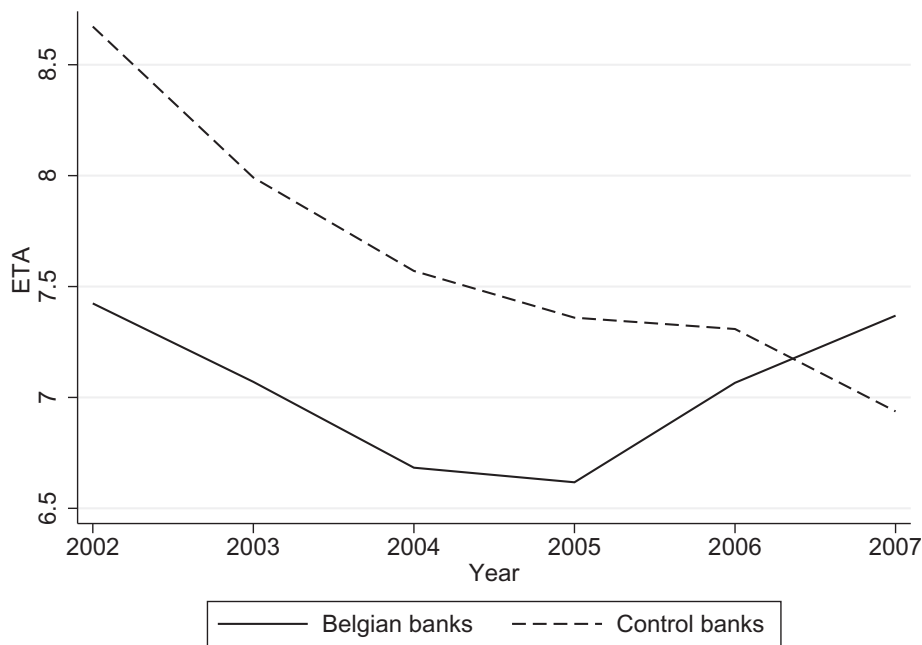


Fig. 1. Evolution of the equity ratio for the Belgian banks and the control group of banks.

an exogenous change in tax legislation in Belgium in 2006 that reduced the relative tax advantage of debt funding by creating a tax shield for equity, called the notional interest deduction (NID). The exogenous variation created by this change allows to identify the direct impact of the unequal tax treatment of debt and equity on bank capital levels, the implications for bank risk-taking behavior, and, ultimately, how changes to tax shields can contribute to better bank capital regulation.

The first main finding of this paper is that tax shields have a significant impact on bank capital structure decisions. The empirical identification of this finding relies on a difference-in-differences (DiD) approach that compares the evolution of the capital buffers of Belgian banks that were subject to the change in tax legislation with a group of matched banks in other European countries that did not experience such a change. Using this setup, I show that reducing the tax discrimination of equity funding vis-à-vis debt funding increases the equity ratio of the average treated bank in the baseline setup with 0.94 percentage points, which corresponds with an increase of more than 13%. This finding is depicted in Fig. 1, which shows the evolution of the average equity ratio for the Belgian banks and the final control group of European banks between 2002 and 2007. Both groups have a very similar trend in their equity ratio during the pre-treatment period, while there is a strong increase in the average equity ratio of the Belgian banks in 2006 and 2007. The explanation for this finding can be found in the trade-off theory of capital structure, as creating a tax shield for equity decreases the marginal benefit of debt.

Next, I investigate which factors are driving the change in equity ratios. Banks can increase their equity ratios either by increasing their equity, by decreasing their assets, or by a combination of both actions. The results in this paper indicate that the impact of the change in

tax treatment is driven by an increase in bank equity and not by a reduction of activities. This result is crucial for at least four reasons. First, it confirms that the observed increase in equity ratios is most likely the consequence of the surge in the (relative) tax benefit for equity. Second, when considering tax shields as a regulatory policy tool, a bank regulator is interested in the channels through which the impact on equity ratios is realized. Due to the fragile economic recovery after the 2008–2009 financial crisis, a large part of the recent regulatory discussion on higher capital requirements focuses on whether they could harm the real economy through a reduction in bank lending. At the same time, a reduction in lending could be beneficial during periods of excessive lending or liquidity creation by banks (Acharya and Naqvi, 2012; Berger and Bouwman, 2014). Hence, it is vital to know where the change in equity ratios is coming from. Third, it indicates that the observed changes in equity ratios are unlikely to be driven by a reduction in loan demand due to the fact that the tax change also holds for non-financial firms. Fourth, this finding makes it highly unlikely that a heterogeneous pass-through of a contemporaneous increase in European Central Bank (ECB) policy rates during the treatment period is driving the main results.<sup>2</sup> Additional robustness tests (see Section 4) confirm this finding.

Besides focusing on the direct impact of taxes on bank capital structure, this paper addresses two important additional concerns that a regulator could have when contemplating the use of tax shields as an incentive mechanism to increase bank capital buffers: (i) whether both ex-ante low and high capitalized banks react to the change in tax

<sup>2</sup> See, e.g., Van Leuvensteijn, Kok, Bikker, and Van Rixtel (2013), Kok and Werner (2006), and De Graeve, De Jonghe, and Vander Vennet (2007) for evidence on the heterogeneous pass-through of monetary policy in the eurozone.

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