Eliminating the tax shield through allowance for corporate equity: Cross-border credit supply effects

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Introduction

- Regulatory bank capital requirements can be socially expensive as it may lower liquidity creation by banks.
- An alternative way to achieve higher levels of capitalization would be to reduce the tax benefit of debt.
- The ACE makes capital relatively more attractive to debt; evidence suggests that it leads to the desired effect of higher levels of bank capitalization (Schepens, 2016).
- What are the asset-side effects? Is liquidity creation affected? Do banks adjust their portfolios in response to the ACE?

Allowance for Corporate Equity (the Belgian ACE)

- Belgian legislation passed a bill on 30th June, 2005: firms (both banks and corporates) can deduct a notional interest rate on equity from their tax liabilities.
- The legislation effectively reduces the difference of tax benefit between debt and equity and makes equity relatively more attractive.
- The deduction equals the average of the observed 10-year Belgian government bond rate from the two years before the actual fiscal year.

Preview

- We study the impact of the Belgian ACE on the cross-border lending by Belgian banks.
- Belgian banks increased their contribution to the syndicates relative to the non-Belgian banks, following the implementation of the ACE.
- The increase is larger in safer borrowers, i.e., borrowers with higher Z-Scores.
- We have additional evidence on the heterogeneous effects of ACE on credit supply in different countries.
- Number of loans extended in a borrower country-industry suggest that Belgian banks increased loan provisioning at the extensive margin as well.

Preview

- Belgian banks increased loan provisioning to Belgian borrowers even more than to foreign borrowers, when compared to non- Belgian lenders.
- We find that borrowers obtained loans with lower spreads after the Belgian tax reform if the loan syndicate contained at least one Belgian bank as a lead arranger.
- This corroborates the hypothesis that Belgian lenders' supply curve shifted outward after the introduction of ACE.
- There is no effect on spreads in syndicates which contain a Belgian participant, but not a lead.

Literature

- Cross-border spillovers (balance sheet shocks or regulatory shocks): Peek and Rosengren, 1997, 2000; De Haas and Van Horen, 2013, Houston et al., 2012, Ongena et al., 2013.
- Taxes and lending: Buch et al., 2016, Devereux et al., 2013, Horvath, 2013.
- Celerier, Kick and Ongena: German credit registry, multiple shocks. We focus on the Belgian ACE, have borrowers from many countries, have results on contract terms.
- Tax incidence: Barrios et al., 2012, Kogler, 2017, and syndication process: Bruche et al., 2017.

Hypothesis: Overall effect

- The ACE had two related effects on banks.
- First, it reduced the relative tax advantage of debt financing, motivating higher levels of bank capitalization.
- Second, it lowered the bank's overall cost of funding, by lowering its tax liabilities.
- Both of these effects are expected to induce banks to increase the total supply of credit.

Hypothesis: Risk-taking

- The expected effect of the ACE on bank risk-taking is ambiguous.
- Reduced risk-taking: higher levels of capital reduces banks incentives to take risk through the skin-in-the-game effect (Holmstrom and Tirole, 1997) and through mitigating asset substitution problems (Jensen and Meckling, 1976).
- Increased risk-taking: lower funding costs and higher bank capitalization make regulatory constraints less binding, and reduce the expected cost of bankruptcy. Banks adjust their portfolios by increasing their level of riskiness (e.g., Allen et al., 2015).

Hypothesis: Borrower country heterogeneity

- Several papers find evidence that in response to negative shocks, banks reallocate their portfolios towards more captive borrowers (Dell'Ariccia and Marquez, 2004, De Haas and Van Horen, 2012, Giannetti and Laeven, 2011, Giannetti and Saidi, 2018, De Jonghe et al., 2018).
- As ACE is a positive shock, we expect that banks would expand lending to borrowers in geographically distant markets.
- Regulation: A regulatory arbitrage argument (e.g., Houston et al., 2012, Ongena et al., 2013) suggests that Belgian banks would disproportionately expand lending to borrowers in countries with lax regulatory standards.
- Market power: Belgian banks would disproportionately expand lending to borrowers in countries with non-competitive banking sectors in order to access higher margins.

Data

- Sample: loan facilities issued to European (non-Belgian) firms between 2004 and 2007 in the syndicated loan market.
- Only consider cross-border lending. Exclude loans made to Belgian firms by banks in all countries.
- Final sample: 7035 loan facilities issued by 571 banks in 52 countries including 5 Belgian banks.
- Source: DealScan, WorldScope, World Bank databases.
- To match borrowers from DealScan to WorldScope: Ferreira and Matos (2012) provide the DealScan-WorldScope link file.

Matched sample

- To reduce the likelihood that our results are driven by unobserved bank heterogeneities, we also generate a matched sample using propensity score matching based on the following characteristics.
- Bank characteristics: the bank's level of cross-border syndicated lending in 2004-2005 and its growth rate during the same period, the average total assets and Z-Score of its borrowers in 2004-2005.
- Country characteristics: the GDP growth and inflation in 2005 in the country in which the bank is head-quartered.
- Matched sample: 4 Belgian banks (lose one due to lack of information on borrowers) and 20 non-Belgian banks.

Empirical Specification

- We identify the effect of ACE on banks' cross-border credit supply and risk taking using a difference-in-difference methodology. We estimate:

$$\begin{aligned} Volume_{i,j,k,l,t} = {} & \beta_1 Belgian_i * Post_t + \beta_2 Belgian_i * Post_t * Zscore_{l,t-1} \\ & + \beta_3 Belgian_t * Zscore_{l,t-1} + \beta_4 C_{i,t-1} \\ & + \beta_5 Relationship_{i,l,t-1} + \gamma_i + \delta_k + \epsilon_{i,j,k,l,t}, \end{aligned} \tag{1}$$

- *Volume* is the log of the USD amount of the contribution of lender i in the syndicate, k.

- *Belgian* $*$ *Post* indicate lending by Belgian banks in the post-treatment period (2006-2007). Its interaction with $Z - Score$ reflects changes in risk-taking, post legislation.

- We include loan fixed effects to control for loan-demand as in Khwaja-Mian, 2005 and bank fixed effects to control for time-invariant bank characteristics. In some specifications we include lender-year fixed effects. Standard errors are clustered at the bank-level.

Parallel Trends

Table: Loan characteristics between treated and control groups

Full sample	Belgian	non-Belgian	Difference	t-Statistic
Loan size	763.596	920.606	157.010	0.254
Loan spread	176.711	172.070	-4.641	-0.070
Maturity	73.771	75.681	1.909	0.117
Secured loans	0.117	0.170	0.053	0.453
Covenants	0.026	0.088	.062	0.584

Matched sample	Belgian	non-Belgian	Difference	t-Statistic
Loan size	763.596	1056.808	293.213	0.698
Loan spread	176.711	143.660	-33.051	-0.961
Maturity	73.771	79.830	6.058	0.366
Secured loans	0.117	0.118	0.001	0.028
Covenants	0.026	0.017	-0.009	-0.741

Overall effects

Table: The overall effect of ACE on cross-border syndicated loan supply

	Full sample				Matched sample			
Bel*Post	0.133***	0.164*	-0.009		0.077	0.563***	0.329*	
	(3.09)	(1.69)	(-0.11)		(0.99)	(4.29)	(1.77)	
Bel*Post*Z score			0.182***	0.264***			0.221**	0.358
			(3.01)	(2.93)			(2.15)	(1.25)
Bel*Z score			0.026	0.026			0.026	0.031
			(1.55)	(1.37)			(0.43)	(0.57)
Observations	7035	2264	2264	2185	783	289	289	282
adj. R^2	0.920	0.918	0.918	0.914	0.928	0.961	0.962	0.955
Bank FE	Yes	Yes	Yes	-	Yes	Yes	Yes	-
Bank*Year FE	No	No	No	Yes	No	No	No	Yes
Facility FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Placebo

Table: Placebo tests

	2004-05	2004-05	2004-05	2004-05	Dutch	Dutch
Belgian * Post	0.016 (0.35)	0.039 (0.39)	0.148 (0.80)	-0.019 (-0.08)		
Belgian * Post * Z score		0.016 (0.34)		0.062 (0.87)		
Belgian * Z score		0.014 (0.26)		-0.027 (-0.28)		
Dutch * Post					-0.069 (-1.11)	-0.083 (-0.65)
Dutch * Post * Z score						-0.002 (-0.06)
Dutch * Z score						-0.011 (-0.54)
Observations	9173	3879	1047	486	6446	2083
adj. R^2	0.928	0.907	0.944	0.950	0.908	0.891
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Facility FE	Yes	Yes	Yes	Yes	Yes	Yes

Borrower country heterogeneity

- The triple interaction with Z-Score in each regression remains positive and statistically significant. Belgian banks especially increased lending toward safer borrowers; and this source of heterogeneity was unrelated to other borrower country characteristics.
- We find no evidence that Belgian banks increase cross-border loan supply especially in more or less competitive markets (as measured by HHI or Lerner index).
- Belgian banks increased their credit supply especially in countries with fewer regulatory restrictions on bank activities.
- Some evidence that Belgian banks increased their supply of cross-border loans to borrowers situated in non-neighbouring countries.

The effect of ACE at the extensive margin

Table: The effect of ACE at the extensive margin

	Baseline	2004-2005	Dutch
Belgian * Post	0.096**	-0.111	
	(2.38)	(-0.41)	
Dutch * Post			-0.119
			(-1.22)
CPI	0.008	-0.024	-0.009
	(0.37)	(-1.08)	(-0.36)
GDP per capita	0.477	-0.343	0.973*
	(1.03)	(-0.60)	(1.90)
GDP growth	-0.022	-0.017	-0.025
	(-1.04)	(-0.28)	(-1.11)
Observations	4014	4026	3722
adj. R^2	0.560	0.519	0.567
Borrower country * Industry * Time FE	Yes	Yes	Yes
Borrower country * Industry * Bank FE	Yes	Yes	Yes

The effect of ACE on domestic credit supply

Table: The effect of ACE on domestic credit supply

	Full sample			Matched sample		
Belgian * Post	0.164***	0.120***	0.151***	0.096	0.041	0.114
	(5.37)	(3.15)	(3.38)	(1.35)	(0.52)	(0.94)
Belgian * Post * Domestic		0.258**	0.258**		0.962***	0.978**
		(2.11)	(2.14)		(2.85)	(2.32)
Belgian * Domestic		-0.138	-0.131		-0.485	-0.439
		(-0.85)	(-0.82)		(-1.71)	(-1.59)
Post * Domestic		-0.019	-0.023		-0.133	-0.133
		(-0.48)	(-0.59)		(-0.77)	(-0.79)
Domestic		0.261***	0.262***		0.392***	0.401***
		(8.19)	(8.35)		(4.19)	(4.24)
Belgian * Post * Relationship			-0.169			-0.289
			(-1.23)			(-1.04)
Belgian * Relationship			0.184**			0.190
			(2.40)			(1.56)
Post * Relationship			0.041			-0.011
			(0.66)			(-0.06)
Relationship	0.195***	0.169***	0.156***	0.218**	0.181**	0.163*
	(7.84)	(7.53)	(5.88)	(2.71)	(2.26)	(1.86)

Empirical Specification: Spread

- We estimate difference-in-difference regressions with loan spread as the dependent variable, and the level of observation is a facility:

$$\begin{aligned} Spread_{k,l,t} = \beta_1 * Belgian(lead)_k * Post_t + \beta_2 * C(avrg)_{k,t-1} \\ +\beta_3 * Borrower_{l,t-1} + \beta_4 * Loanterms_k \\ +Relationship(avrg)_{k,t-1} + \lambda_k + \epsilon_{i,j,k,l,t}, \end{aligned} \tag{2}$$

- *Belgian*(*lead*) indicates that at least one of the lead arrangers of the loan is a Belgian bank. We re-estimate the identical regression with *Belgian*(*participant*).

- We include a host of variables to control for loan characteristics as well as time varying borrower characteristics and country-level controls.

Empirical Specification: Spread

- We cannot include facility fixed effects, because all lenders in the facility receive the same interest.
- Thus, we cannot fully attribute any change in spreads to be supply-driven.
- In the loan origination process, lead banks negotiate terms and participating banks take these terms as given.
- We expect that the spreads of especially those loans is reduced in which Belgian banks act as lead banks, not when Belgian banks are participants only.

Spread regressions

Table: The effect of ACE on the spread of syndicated loans with Belgian (lead) banks

	Full	*Full*	*Full*	*Matched*	*Matched*	*Matched*
Belgian (lead) * Post	-19.660**	-15.320	-36.801*	-22.915**	-27.036**	-53.016**
	(-2.24)	(-1.59)	(-1.74)	(-2.35)	(-2.45)	(-2.57)
Belgian (lead)	-3.783	-8.531	17.973	5.688	3.695	29.403***
	(-0.41)	(-0.84)	(1.64)	(0.56)	(0.33)	(2.91)
Observations	5053	5044	743	3094	3084	552
Borrower Controls	No	No	Yes	No	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	No	Yes	Yes	No
Borrower Country * Year FE	No	Yes	Yes	No	Yes	Yes

Spread regressions

Table: The effect of ACE on the spread of syndicated loans with Belgian (participant) banks

	Full	*Full*	*Full*	*Matched*	*Matched*	*Matched*
Belgian (participant) * Post	5.985	1.372	25.851	18.502**	17.354*	19.026
	(0.67)	(0.14)	(1.60)	(1.97)	(1.78)	(1.14)
Belgian (participant)	-9.132	-7.331	12.986	-8.690	-6.809	22.130**
	(-1.39)	(-1.08)	(1.20)	(-1.34)	(-1.04)	(2.20)
Observations	5053	5044	743	3094	3084	552
Borrower Controls	No	No	Yes	No	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	No	Yes	Yes	No
Borrower Country * Year FE	No	Yes	Yes	No	Yes	Yes

Concluding Remarks

- Taxing leverage can be an effective form of inducing lower bank leverage without inducing an overall reduction of lending, or increasing bank risk-taking.
- In addition, the increased credit supply in non-neighbouring countries might enhance financial stability through better diversified banks.
- On the flip side: lending to less familiar borrowers might expose banks to new types of risks.
- Finally, Belgian banks engaging in regulatory arbitrage might undermine regulatory objectives and/or financial stability.