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ABSTRACT

We demonstrate that the European Monetary Union (EMU) increases cross-border depositing but not lending among EMU countries by 31%. While being a member of the European Union (EU) increases cross-border loans by 49%, cross-border deposit volumes are unaffected.

1. Introduction

The dramatic increase in cross-border banking is widely believed to lie at the heart of recent financial crises, with European banks playing an important role at both global and European levels (see e.g., Shin, 2011). What have been the contributions of European integration and common currency endeavors to this increase? We demonstrate that the euro has boosted intra-Euro-zone cross-border deposits by over 30%. To date, there has been no EMU-effect on cross-border lending. However, EU membership has increased lending by nearly 50%. The presence of these EMU and EU-specific effects signifies that European banks increased cross-border banking within Europe over and above the well-documented expansion to other countries, notably the widely debated expansions of US Dollar positions of European banks in the USA.[1] We build on influential papers by Rose (2000), Glick and Rose (2002) and Frankel and Rose (2002), who investigated the common currency effect. Our objective is to provide a rigorous proof of the potential endogeneity of banking market integration with respect to both a common currency and regional integration schemes in a gravity model-inspired setting.

2. Data

We employ confidential, bilateral data from the Bank for International Settlements' (BIS) locational statistics, which define banks and customers according to their country of residence. These data are disaggregated by (1) reporting (bank) country and *vis-à-vis* (customer) country, (2) customer type (non-bank customers) and (3) bank assets (loans) and liabilities (deposits). There is an emerging consensus that cross-border banking analyses should focus on gross instead of net stocks and flows (Borio and Disyatat, 2011; Shin, 2011). Thus, being able to differentiate between assets and liability is essential and distinguishes our study from the existing literature. Our sample covers 23 bank countries and 165 customer countries from 1995 to 2008. The BIS reports quarterly stocks as well as exchange rate-adjusted flows, which we use to calculate annual *exchange rate-adjusted stocks* that are free of exchange rate valuation effects.

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[1] Expansions towards non-Euro-zone or non-European Union countries are being controlled for partly by observable determinants (like GDP, trade, etc.) and partly by country-pair effects.

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Currency unions—EMU and other 'exchange rate arrangements with no separate legal tender'—and fixed exchange rate regime proxies—'de facto pegs' and 'de facto bands' of maximally ±2.25%'—are defined by utilizing the Reinhart and Rogoff (2004) *natural classification algorithm* in conjunction with Ilzetzki et al.'s (2008) updated classification of countries' exchange rate arrangements. To measure EU and other free trade agreement (FTA) memberships, we update and extend Rose's (2005) dataset.[2]

3. Methodology

We estimate an adapted empirical gravity model:[3]

$$\ln X_{ijt} = \alpha + \beta_1 \ln \mathrm{SIZE}_{ijt} + \sum_{k=2}^{K} \beta_k Y_{ij} + \sum_{l=K+1}^{L} \beta_l Z_{ijt} + \beta_{\mathrm{CU}} \mathrm{CU}_{ijt} + \beta_{\mathrm{FTA}} \mathrm{FTA}_{ijt} + u_{ijt}. \quad (1)$$

X_{ijt} are exchange rate-adjusted stocks of cross-border loans or deposits. Size is the product of the GDPs of any given pair of countries. Y_{ij} are time-invariant controls and proxies for trade cost, such as distance or the presence of a common border. Z_{ijt} are time-varying controls or trade costs. CU_{ijt} and FTA_{ijt} are dummies that take the value 1 if both countries are members of the same currency union or FTA in year t, respectively. As such, our analysis is of the differences-in-differences type. In line with Anderson and van Wincoop (2003) but closely following Baldwin and Taglioni (2006), we account for all bilateral transactional frictions in asset markets by using country pair effects (λ_{ij}) instead of separate bank and customer country dummies. To capture unobserved time effects, such as global business cycles or regulatory changes inside and outside the regional arrangements, we include time fixed effects τ_t. Thus, we assume the errors u_{ijt} to be independent but not necessarily identically distributed:

$$u_{ijt} = \lambda_{ij} + \tau_t + \varepsilon_{ijt}. \quad (2)$$

4. Results

Regression (1) in Panels A and B (see Table 1) considers currency unions and FTAs in general. Whereas exchange rate pegs do not matter for deposits or loans, adopting a common currency does. This effect is substantial for deposits, as a common currency raises cross-border deposit stocks by $100 * (\exp(0.25) - 1) = 28.4\%$. However, membership in the same FTA does not affect cross-border deposits. The situation is reversed for loans: A common currency increases cross-border loans by 27.1% (this effect is not significant at conventional levels), whereas FTA membership boosts cross-border loans by an impressive 47.7%. Regression (2) focuses in particular on the impact of the EU and EMU on deposits and loans. Three observations can be made. First, a general currency union effect can only be established for cross-border deposits: The EMU effect is 30.7%, while the impact of other currency unions is only slightly smaller (25.1%). For loans, the EMU impact closely misses the 10% significance level, and the point estimate is roughly comparable to the effect on deposits. In contrast, other currency unions may even have potentially negative effects. Second, while cross-border depositing in Europe is driven by the single currency and not by EU membership, the single European market increases cross-border loans by 49.0%. Third, cross-border deposits, but not loans, outside Europe seem to be driven by the existence of a joint FTA agreement. Overall, these findings suggest that the EU single banking market legislation has made a specific difference in cross-border banking when compared to regulations in other regional arrangements. Regressions (3)–(6) present robustness checks of this benchmark regression (2). Regression (3) estimates a random effects model that allows us to estimate the effects of time-invariant determinants, e.g., distance and border. The coefficients are significant and have the usual size. Our main results are thus confirmed. For deposits, however, there are slight changes in the coefficient size for non-EMU and non-EU dummies, though the Hausman test favors the fixed-effects model. Regression (4) shows that excluding bilateral trade would lead to an overestimation of the EMU effect, thus supporting our preferred specification. Regression (5) controls for de facto and de jure openness as measured by the KOF globalization index. For loans, we find that non-EMU currency union membership leads to less cross-border loans. However, this finding may be a sampling effect, as we only include a small number of non-EMU currency unions in our study; the results on non-EMU currency unions are very sensitive to sample selection and should thus be interpreted with care. Therefore, we maximize our sample size in regression (6) by excluding the insignificant interest rate differentials. Again, the main results hold but for an increased coefficient in non-EMU currency unions' deposits.

5. Conclusions

This paper presents new findings on the impact of currency unions and regional integration arrangements on cross-border retail banking. First, currency unions tend to promote cross-border depositing but not cross-border lending. While this result is not surprising given that credit markets are more exposed to information asymmetries, policy makers still face a challenge when trying to identify cross-border credit drivers. Second, as a partial answer to this challenge, we find that EU membership is a strong driver of cross-border lending. Third, because we also find that other regional arrangements fail to increase cross-border loans, we conclude that the European single banking market legislation could be playing a crucial role in the expansion of cross-border lending within Europe. This leads to questions that deserve further investigation: Why has EU membership been so important for loans but not for deposits? Why have other FTAs been so successful in increasing cross-border depositing but not cross-border loans? To answer these questions is beyond the scope and intention of this short paper, but these questions are of considerable interest to those who design regional integration schemes and those who are affected by them.

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[2] Details on the dataset, including details on all other control variables, are available upon request from the authors.

[3] See Lane and Milesi-Feretti (2008), Martin and Rey (2004), Portes and Rey (2005), Aviat and Coeurdacier (2007) and Heuchemer et al. (2009) for adaptations of gravity models to international finance.

Table 1
The determinants of cross-border retail banking.

	Panel A: cross-border deposits						Panel B: cross-border loans					
	(1) FE	(**2**) **FE**	(3) RE	(4) FE	(5) FE	(6) FE	(1) FE	(**2**) **FE**	(3) RE	(4) FE	(5) FE	(6) FE
Size	0.06*	**0.07****	0.24***	0.09***	0.10**	0.04**	0.36***	**0.36*****	0.40***	0.40***	0.52***	0.23***
	1.90	**1.98**	10.16	2.79	2.15	1.97	6.57	**6.56**	14.81	7.04	7.41	6.02
Distance			−0.77***						−0.67***			
			−12.10						−10.08			
Common border$_D$			0.77**						0.70**			
			1.96						2.20			
Fixed exchange rate$_D$	0.02	**0.04**	−0.02	0.03	0.03	0.04	0.08	**0.08**	0.05	0.08	0.05	0.06
	0.26	**0.43**	−0.19	0.42	0.33	0.42	0.67	**0.70**	0.44	0.70	0.43	0.57
Currency union$_D$	0.25**						0.24					
	2.35						1.56					
Currency union$_{D,\text{EMU}}$		**0.27****	0.23**	0.32***	0.26**	0.26**		**0.25**	0.20	0.32**	0.23	0.22
		2.42	2.24	2.91	2.33	2.28		**1.62**	1.41	2.10	1.44	1.49
Currency union$_{D,\text{non-EMU}}$		**0.22*****	0.42**	0.23***	0.25***	0.60**		**−0.35**	0.08	−0.33	−0.55***	0.40
		8.95	2.02	9.57	7.69	2.21		**−1.53**	0.19	−1.46	−13.24	0.67
Deposit interest rate difference$_{B\text{-}C}$	0.00	**0.00**	0.00	0.00	0.00							
	0.64	**0.69**	0.19	0.93	0.59							
Loan interest rate difference$_{B\text{-}C}$							0.00	**0.00**	0.00	0.00	0.00	
							0.59	**0.60**	−0.07	0.88	0.60	
Trade	0.08***	**0.08*****	0.15***		0.07***	0.11***	0.11***	**0.11*****	0.19***		0.09***	0.15***
	4.18	**4.20**	7.92		3.54	5.80	4.36	**4.34**	8.29		3.40	5.90
FTA$_D$	0.13						0.39***					
	1.39						2.96					
FTA$_{D,\text{EU}}$		**0.06**	0.05	0.09	0.03	0.08		**0.40*****	0.42***	0.43***	0.26*	0.39***
		0.70	0.55	0.99	0.37	0.87		**2.99**	3.38	3.24	1.86	3.12
FTA$_{D,\text{non-EU}}$		**1.50*****	0.96*	1.52***	1.50***	1.52***		**0.02**	−0.51	0.03	0.01	0.01
		3.15	1.91	3.16	3.14	3.19		**0.04**	−1.16	0.07	0.01	0.01
Globalization					0.00						0.00***	
					0.79						3.53	
R^2	0.286	**0.264**	0.346	0.176	0.282	0.275	0.384	**0.385**	0.427	0.351	0.397	0.391
Observations	28,348	**28,348**	28,348	28,348	25,245	31,489	26,078	**26,078**	26,078	26,078	23,471	30,354

Notes: this table shows fixed effects (FE) and random effects (RE) regressions with heteroskedasticity robust standard errors clustered by country-pair. The regressions contain an intercept and year dummies. For each independent variable, the first row shows the coefficient and the second row the t-statistic. Subscripts B and C indicate the bank and customer country, respectively; and D indicates a dummy variable. Our main regressions are highlighted in bold.

* Indicate significance at the 10% level.
** Indicate significance at the 5% level.
*** Indicate significance at the 1% level.

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