



FDI versus Cross-Border Financial Services

Evidence from German Bank-Level Data

Claudia M. Buch (University of Tuebingen)
Alexander Lipponer (Deutsche Bundesbank)

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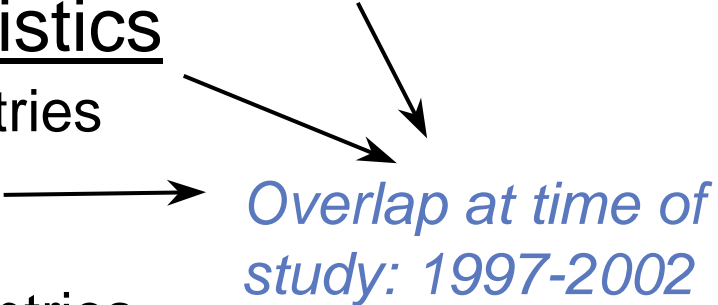
Motivation and Key Questions

- German banks account for 10% of banks' international assets.
 - How important is bank heterogeneity for banks' international expansion?
 - Which country-level determinants shape their international activities?
 - Are FDI and cross-border financial services linked?
- Patterns of internationalization are similar across banks.
 - Is there evidence for agglomeration effects?

Related Literature

- Large body of theoretical and empirical literature on banks' international activities
 - Regulatory and information-cost related barriers to FDI & cross-border lending
 - Do banks “follow-their-clients”?
- Few studies focus on agglomeration effects.
- Bank-level studies become increasingly important.

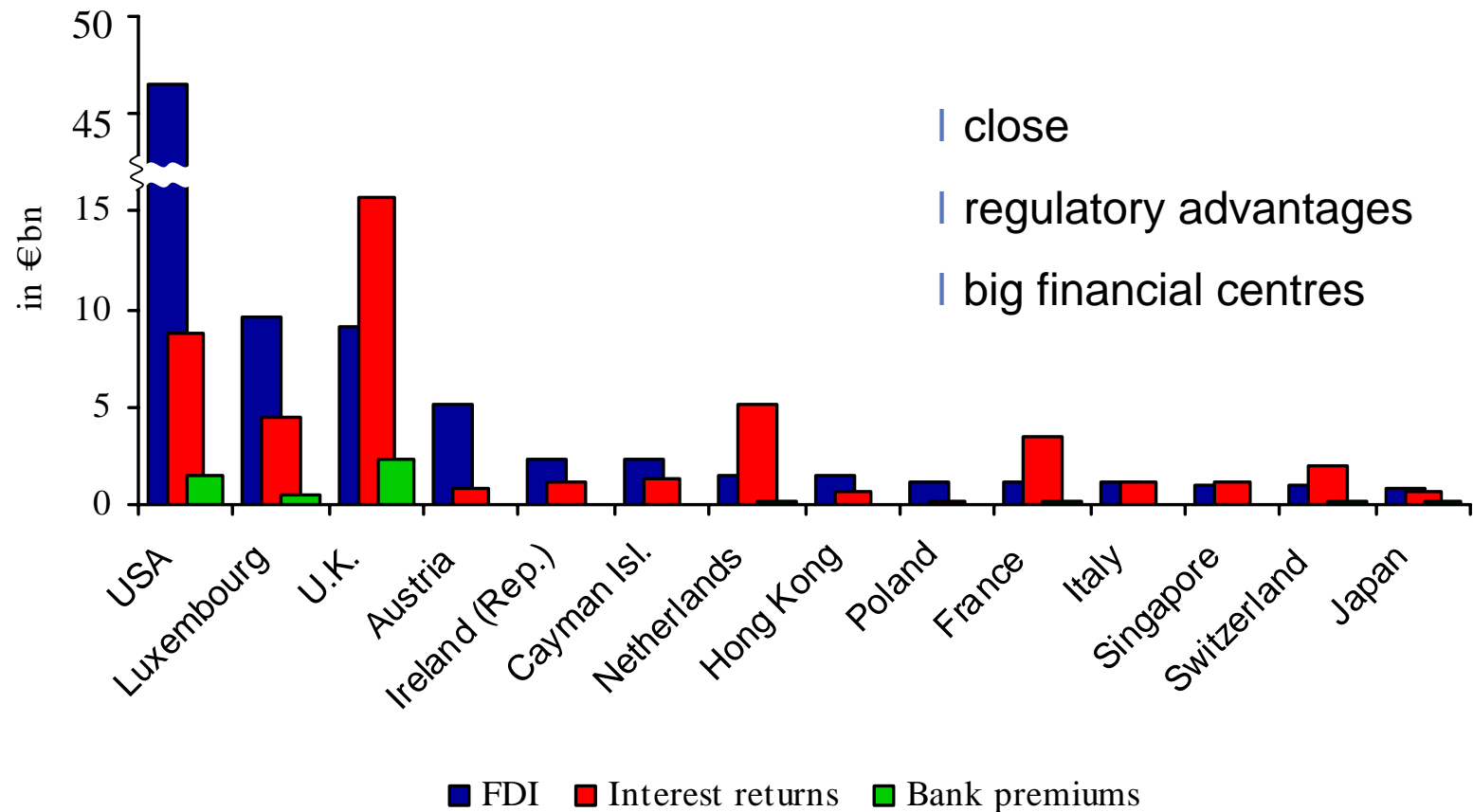
Data Sources

- German banking statistics
 - data on *all German banks* (2574 in 2000), 600 domestic banks
 - distinguish internationally “active” & “inactive” banks
 - balance sheet and earnings (profit-and-loss account)
 - German FDI stock statistics
 - yearly, firm level, 64 countries
 - German BoP statistics
 - transaction level, 185 countries
- Overlap at time of study: 1997-2002*
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Definitions of FDI and Financial Services

- Foreign direct investment
 - consolidated sum of primary and secondary FDI in equity capital minus current profits / losses
- Financial services
 - interest returns paid and received for deposits, loans and credits (= returns)
 - bank premiums paid and received
 - intra- and inter-bank

Regional Distribution of FDI and Financial Services



Determinants of FDI and Financial Services: Tobit Analysis

$$y_{ijt} = \beta_0 + t + \beta_i x_{it} + \beta_j x_{jt} + \varepsilon_{ijt}$$

constant time bank-specific country-specific

Robustness tests:

- Multinomial logit
- Seemingly unrelated regressions (SUR)
- Sample splits (OECD / non-OECD)

Explanatory Variables: Bank-Level

- Total assets (log) + ✓
- Profitability + ✓
(yields from operational business / total assets)
- Internationalisation + ✓
(cross-border / total lending and borrowing)
- Dummy for type of bank

Explanatory Variables: Country Level

- Proxies for market size
 - Log GDP **+** ✓
 - Trade (Sum of bilateral trade / GDP) **+** ✓
 - Cultural / geographical distance
 - Distance (log) **-** ✓
 - Common border **+** ✓
 - Common language **+** ✓
- } robustness check

Explanatory Variables: Country Level (2)

- Proxies for stability / regulations

- | | | | |
|--|---|----------|---|
| ● Inflation (GDP deflator) | ? | (large:) | + |
| ● Risk (Euromoney 0 → 100) | + | | ✓ |
| ● Banking freedom (heritage.org 1 → 5) | - | 0 / | ✓ |
| ● Capital controls (0/1-dummy) | - | | ✓ |
| ● EU | ? | (+) | 0 |
| ● Toughness of supervision (0 → 6) | ? | | + |
| ● Transparency (0 → 4) | ? | | + |
| ● Offshore (Bundesbank 0/1-dummy) | + | | ✓ |

Regression Results: FDI and Services

	FDI		Bank premiums		Interest payment and income	
	M.E. 1	M.E. 2	M.E. 1	M.E. 2	M.E. 1	M.E. 2
Internationalisation	4.52e-07 (0.000)***	8.41e-03 (0.000)***	9.44e-05 (0.000)***	1.94e-02 (0.000)***	2.09e-03 (0.000)***	3.63e-02 (0.000)***
Assets	2.80e-05 (0.000)***	5.20e-01 (0.000)***	2.17e-03 (0.000)***	4.45e-01 (0.000)***	5.31e-02 (0.000)***	9.23e-01 (0.000)***
Profitability	3.72e-06 (0.000)***	6.92e-02 (0.000)***	3.13e-04 (0.000)***	6.42e-02 (0.000)***	4.44e-03 (0.000)***	7.73e-02 (0.000)***
Distance	-7.09e-06 (0.001)***	-1.32e-01 (0.001)***	-1.40e-03 (0.000)***	-2.87e-01 (0.000)***	-1.73e-02 (0.000)***	-3.00e-01 (0.000)***
Inflation	5.89e-10 (0.000)***	1.10e-05 (0.000)***	6.48e-08 (0.000)***	1.33e-05 (0.000)***	1.95e-07 (0.000)***	3.40e-06 (0.000)***
GDP	5.74e-06 (0.000)***	1.07e-01 (0.000)***	6.50e-04 (0.000)***	1.33e-01 (0.000)***	2.25e-02 (0.000)***	3.91e-01 (0.000)***
Trade	7.33e-07 (0.003)***	1.36e-02 (0.003)***	-2.34e-05 (0.045)**	-4.79e-03 (0.045)**	8.26e-04 (0.000)***	1.44e-02 (0.000)***

Regression Results: FDI and Services (2)

	FDI		Bank premiums		Interest payment and income	
	M.E. 1	M.E. 2	M.E. 1	M.E. 2	M.E. 1	M.E. 2
Risk	1.33e-06 (0.000)***	2.47e-02 (0.000)***	1.39e-04 (0.000)***	2.85e-02 (0.000)***	1.88e-03 (0.000)***	3.27e-02 (0.000)***
Freedom	1.38e-06 (0.536)	2.56e-02 (0.536)	-4.34e-04 (0.000)***	-8.91e-02 (0.000)***	-1.27e-02 (0.000)***	-2.20e-01 (0.000)***
Supervision	1.07e-05 (0.000)***	1.99e-01 (0.000)***	6.26e-04 (0.000)***	1.28e-01 (0.000)***	-4.29e-05 (0.886)	-7.47e-04 (0.886)
Transparency	1.62e-05 (0.000)***	3.01e-01 (0.000)***	-1.55e-04 (0.085)*	-3.17e-02 (0.085)*	-1.04e-02 (0.000)***	-1.82e-01 (0.000)***
Capital controls	-9.69e-05 (0.000)***	-7.16e-01 (0.000)***	-2.13e-03 (0.000)***	-3.47e-01 (0.000)***	-1.55e-02 (0.000)***	-2.57e-01 (0.000)***
EU	-9.30e-07 (0.816)	-1.73e-02 (0.816)	-1.40e-04 (0.422)	-2.88e-02 (0.422)	-7.83e-03 (0.000)***	-1.36e-01 (0.000)***
Constant	-1.06e-03 (0.000)***	-1.98e+01 (0.000)***	-7.88e-02 (0.000)***	-1.61e+01 (0.000)***	-1.87e+00 (0.000)***	-3.26e+01 (0.000)***
Observations	285,714		285,714		285,714	
Uncensored	875		4,198		28,157	
R ²	0.37		0.26		0.14	

Regression Results: Links Between FDI and Services

	FDI	Bank premiums	Interest payment and income
Log FDI (residual)	---	1.49e-03	7.34e-03
	---	(0.000)***	(0.000)***
Log interest revenues (residual)	2.01e-06	---	---
	(0.006)***	---	---
Log bank premia (residual)	1.50e-05	---	---
	(0.000)***	---	---
:	:	:	:
:	:	:	:
Observations	285,714	285,714	285,714
Uncensored	875	4,198	28,157
R ²	0.39	0.27	0.14

Intermediate Results

- (Bank) FDI and cross-border financial services depend on similar factors.
- FDI and cross-border services are complements.
- Bank-specific and country-specific factors matter for banks' internationalization decisions.
 - Asset size is the most important variable.
 - Bank-level heterogeneity matters.
 - Banks exploit economies of scale.
- Small and large international banks behave similarly.

Testing for Agglomeration Effects

- Expected effect of activities of other banks:
 - Agglomeration effects: +
 - Competition effect: -
- Proxies for agglomeration effects:
 - $\frac{\text{Sum of FDI of other banks}}{\text{Mean investment of other banks}} = \text{Number of other banks}^*$
- Country fixed effects: Isolate 'true' agglomeration effect

Agglomeration Effects: With FDI of Others

	Full sample	Small banks	Large banks
→ Sum_FDI	1.57e-05 (0.000)***	9.75e-06 (0.000)***	1.80e-01 (0.000)***
∴	∴	∴	∴
Distance	-7.65e-06 (0.253)	-1.33e-06 (0.651)	-2.52e-01 (0.086)*
∴	∴	∴	∴
Freedom	-1.76e-05 (0.038)**	-1.97e-05 (0.000)***	-3.37e-01 (0.037)**
∴	∴	∴	∴
Transparency	3.81e-05 (0.000)***	-3.27e-06 (0.346)	7.14e-01 (0.000)***
∴	∴	∴	∴
Observations	285,714	283,330	2,384
R ²	0.38	0.31	0.15



Agglomeration Effects: Number of Affiliates of Other Banks

	Full sample	Small banks	Large banks
→ Affiliates of other banks	1.78e-06 (0.000)***	4.15e-06 (0.000)***	3.32e-02 (0.000)***
⋮	⋮	⋮	⋮
GDP	2.21e-05 (0.000)***	2.86e-05 (0.007)***	6.80e-01 (0.000)***
⋮	⋮	⋮	⋮
Observations	285,714	283,330	2,384
R ²	0.38	0.30	0.15



Affiliates of Other Banks and Mean Investment

	Full sample	Small banks	Large banks
→ Affiliates of other banks	1.59e-06 (0.000)***	3.34e-06 (0.000)***	3.23e-02 (0.000)***
→ Mean investment others	1.19e-05 (0.012)**	3.12e-05 (0.059)*	1.38e-01 (0.179)
⋮	⋮	⋮	⋮
Observations	262,530	260,350	2,180
R ²	0.38	0.30	0.16

Agglomeration Effects: With Country-Fixed Effects

	Baseline	With Sum of FDI	With number of other banks' affiliates	With number of non-banks' affiliates
→ Affiliates of other non-banks				1.72e-02 (1.67)*
→ Affiliates of other banks			- 6.31e-02 (2.01)**	
→ Sum_FDI		- 4.49e+00 (9.12)***		
∴ Dummies for all countries	∴	∴	∴	∴
Observations			285,714	
R ²	0.40	0.41	0.40	0.40

result driven by large banks
↙ ↘

Bank specific expl.: keep sign and significance Most country specific expl.: insignificant

Summary

- Which banks expand abroad?
 - Larger banks
 - More profitable banks
 - More international banks
- Which country-level determinants matter?
 - Market size and trade encourage international banking.
 - Lower country risk and deregulation of capital controls increase international banking.
 - Impact of banking regulations is ambiguous.

Summary (2)

- Are FDI and cross-border services linked?
 - Evidence for complementarities
- Are there agglomeration effects?
 - Positive effect of presence of other banks captures country characteristics.
 - **Overall, negative competition effect dominates.**

Control for all
unobserved
country
characteristics



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- Buch, Claudia M., and Alexander Lipponer (2007). FDI versus exports: Evidence from German banks. *Journal of Banking and Finance* 31(3): 805-826
 - Buch, Claudia M., and Alexander Lipponer (2006). Clustering or Competition? The Foreign Investment Behaviour of German Banks. *International Journal of Central Banking* 5: 135-168

What's Next?

- Link between real and financial integration are not very well understood.
 - Trade and financial integration are closely linked (Aviat and Courdacier 2007).
- International financial linkages are important for the transmission of shocks across countries.
 - But empirical models of tend to focus on specific transmission channels.

What's Next? – The Data

- Data: Foreign assets of German commercial banks
 - By country, currency, type of assets
 - Domestic banks, foreign branches, foreign affiliates
- Bank-level data for the years 2001-2007
- Very comprehensive, no reporting threshold
- Can be linked, for instance, to balance sheet information

What's Next? – Research Question

- What determines the extensive versus the intensive margin of foreign entry?
 - For non-financial firms, most of the variation takes place at the extensive margin (= number of firms in a given market) rather than the intensive margin (= volume of activity).
- Disentangle different barriers to entry.
- Assess importance of intensive and extensive margin for shock transmission.

Importance of Regions by Volume of Activity and Number of Banks (2007, %)

	Industrialized	Transition	Developing	EU	EMU
Volume	87.86	1.58	10.57	61.86	34.45
Number	50.65	18.02	31.33	49.81	47.65

	Africa	America	Asia	Europe
Volume	0.53	24.28	6.19	68.99
Number	12.55	33.24	17.94	36.27

→ Regional patterns of extensive and intensive margins differ.

Reasons:

- Market size
- Fixed versus variable costs of entry