

What drives local lending by global banks?

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Motivation

- Investigate drivers of foreign bank lending flows
- Literature mostly focused on cross-border lending
- Our focus: local lending of internationally active banks (IABs) through their foreign subsidiaries

Main Questions

- What are the main drivers of local lending by IABs?
- Are these lending flows driven by
 - (a) the financial condition and the macroeconomic environment of the parent bank
 - or
 - (b) the financial condition and the macroeconomic environment of the subsidiary bank
- While both mechanisms are potentially at play, what can we say about their (relative) economic significance?

Preview of Results

- Factors at the subsidiary level are more important determinants of local lending by IABs than factors at the parent bank level
- Results robust to a number of alternative specifications and data definitions
- Adjusting loan growth for FX fluctuations is crucial for obtaining meaningful results

Related literature

- Integration of financial sector in open economy models, post-GFC

Davis (2010); Gertler and Karadi (2011); Kalemli-Ozcan et al. (2013); Kollmann (2013); Kollmann et al. (2011); Meh and Moran (2010); Alpanda and Aysun (2014).

- Credit channel of monetary policy transmission.

Bernanke and Gertler (1995), Kashyap and Stein (2000), Ashcraft and Campello (2007), Jimenez et al. (2009); Aysun and Hepp (2013).

- Push vs. pull factors

Cetorelli and Goldberg (2012a,b); Bruno and Shin (2015); Buch et al. (2016); Fratzscher (2012); Koepke (2015); Rey (2015); Schnabl (2012); Shin (2012).

- Substitution vs. support effect

Buch (2000), Cetorelli and Goldberg (2012); Dahl et al. (2002), De Haas and Van Lelyveld (2006), Goldberg (2002), Jeanneau and Micu (2002), Morgan and Strahan (2004); Peek and Rosengren (2000).

- Decentralized vs. centralized decision making

Avdjiev and Takts (2014); Buch et al. (2016); Campello (2002); Cetorelli and Goldberg (2012a); De Haas and Lelyveldb (2010); Fiechter et al. (2011); Houston et al. (1997).

Data

- Bank-level data : Bankscope (Bureau van Dijk)
 - Financial
 - Ownership, G-SIBs
- Macro : International Financial Statistics (IFS)
 - GDP growth, unemployment rate, cost of funding
- Bilateral global banking data: BIS locational and consolidated banking statistics
 - currency composition
 - cross-country loans
 - number of banks
- Advanced and developing economies
- Annual Panel: 1995-2014

Identifying determinants of banks lending behavior

- Control for parent IAB (country) specific conditions by comparing
 - (1) the loan growth rate of a subsidiary i ($lg_{ij,t}$) of a parent IAB j to
 - (2) the average loan growth of all the subsidiaries ($\bar{lg}_{j,t}$) of the same parent IAB j

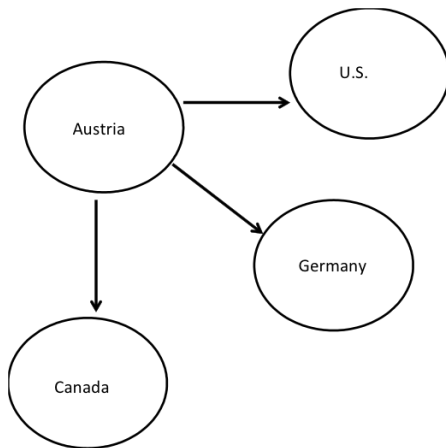
$$ld_{ij,t}^h = lg_{ij,t} - \bar{lg}_{j,t}$$

- Control for subsidiary (country) specific conditions by comparing
 - (1) the loan growth rate of a subsidiary i ($lg_{ij,t}$) to
 - (2) the average loan growth rate of all global bank subsidiaries in the subsidiary country.

$$ld_{ij,t}^l = lg_{ij,t} - \bar{lg}_{i,t}$$

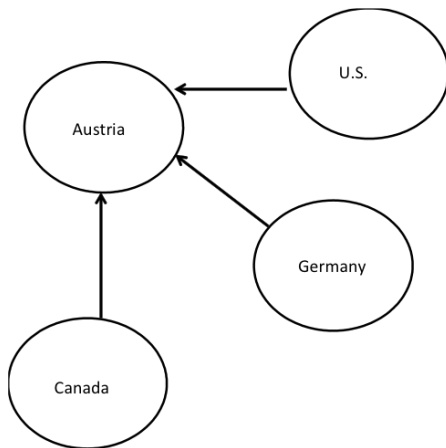
Identifying determinants of banks lending behavior

- Controlling for parent bank (country) specific factors to determine effect of subsidiary (country) factors



Identifying determinants of banks lending behavior

- Controlling for subsidiary (country) specific factors to determine effects of parent bank (country) factors



Adjusting loan growth for FX fluctuations

- Decomposing loans by currency of denomination

$$l_{ij,t} = \sum_{n=1}^Z l_{ij,t}^n$$

- Converting loan amounts from USD to respective currency of denomination

$$l_{ij,t}^{n,c} = l_{ij,t}^n / e_{n,t}^{eop}$$

- Change in loans (expressed in denomination currency units)

$$dl_{ij,t}^{n,c} = l_{ij,t}^{n,c} - l_{ij,t-1}^{n,c}$$

- Obtaining the FX-adjusted change in lending (expressed in USD)

$$dl_{ij,t} = \sum_{n=1}^Z e_{n,t}^a dl_{ij,t}^{n,c}$$

- Obtaining the FX-adjusted growth in lending

$$lg_{ij,t} = \log(l_{ij,t-1} + dl_{ij,t}) - \log(l_{ij,t-1})$$

Benchmark regression specifications

- Examining the significance of subsidiary (country) specific factors

$$ld_{i,j,t}^h = \sum_{k=1}^2 \lambda_k^h ld_{ij,t-k}^h + \gamma_1^h hfd_{ij,t-1} + \sum_{m=1}^M \alpha_m^h of_{j,t-1}^m + \epsilon_{ij,t}^h$$

- Examining the significance of parent bank (country) specific factors

$$ld_{i,j,t}^l = \sum_{k=1}^2 \lambda_k^l ld_{ij,t-k}^l + \gamma_1^l of_{ij,t-1} + \sum_{m=1}^M \alpha_m^l hf_{i,t-1}^m + \epsilon_{ij,t}^l$$

Estimation methodology

- Difference GMM dynamic panel estimator (Arellano and Bover, 1995).
- In our estimations, we use the first lags of all the baseline variables as instruments.
- For all model specifications, the tests of over-identifying restrictions indicate that instruments as a group are valid and exogenous.

Baseline regressions

Table 1: Subsidiary and subsidiary country specific factors

<i>hfd_{ij}</i>	Subsidiary's macro environment			Subsidiary banks' financial condition			
	GDP growth	Unemployment	Deposit rate	Capital Adequacy	Asset Quality	Performance	Liquidity
coefficient estimate of <i>hfd_{ij}</i>	0.7437 (0.016)**	-0.1088 (0.0047)***	-0.0031 (0.0071)***	0.0058 (0.000)***	0.0063 (0.0963)*	0.0010 (0.0001)***	0.0010 (0.0001)***
rel. loan growth, lagged	-0.0196 (0.3474)	-0.0428 (0.1561)	-0.0151 (0.048)**	0.0417 (0.0017)***	0.0560 (0.0001)***	0.0040 (0.3508)	0.0417 (0.1561)
Parent-bank spec. controls	yes	yes	yes	yes	yes	yes	yes
Number of observations	2,881	2,588	1,886	1,668	2,375	3,016	2,999
Hansen test	0.7853	0.7769	0.8908	0.9137	0.9912	0.8717	0.7853
AR2 test	0.5621	0.6295	0.8370	0.7655	0.8960	0.4981	0.4211

Baseline regressions

Table 2: Parent bank and parent bank country specific factors

ofd_{ij}	Parent bank's macro environment			Parent banks' financial condition			
	GDP growth	Unemployment	Deposit rate	Capital Adequacy	Asset Quality	Performance	Liquidity
coefficient estimate of ofd_{ij}	1.3230 (0.0244)**	-0.0378 (0.6408)	-0.0386 (0.2521)	0.0005 (0.1636)	0.0010 (0.5866)	0.0022 (0.0889)*	-0.0005 (0.613)
rel. loan growth, lagged	0.0347 (0.3983)	0.0369 (0.3732)	-0.0850 (0.6144)	0.0517 (0.1884)	0.0482 (0.187)	0.0429 (0.1814)	0.053 (0.162)
Subsidiary specific controls	yes	yes	yes	yes	yes	yes	yes
Number of observations	1535	1535	458	1291	1304	1319	1328
Hansen test	0.9867	0.9738	1.0000	0.9557	0.9534	0.9310	0.954
AR2 test	0.3569	0.4078	0.5836	0.3765	0.3562	0.3969	0.373

Robustness checks

- Broader set of macroeconomic and bank-level indicators
- Sample restrictions
 - Excluding countries without data on currency decomposition of lending
 - Accounting for mergers and acquisitions
 - Accounting for cross-border lending
 - Accounting for the number of banks
 - Unadjusted loan growth rates
- Economic significance
- Country-level data estimation
- Main independent variables in non-deviational form

Robustness checks

Table 3: Alternative macroeconomic variables

	Subsidiary's macro environment	Parent bank's macro environment
GDP	0.7437 (0.016)**	1.3230 (0.0244)**
Unemployment	-0.1088 (0.0047)***	-0.0378 (0.6408)
Exchange rate	0.2413 (0.0042)***	-0.2022 (0.3148)
Deposit rate	-0.0031 (0.0071)***	-0.0386 (0.2521)
Lending rate	-0.1377 (0.0004)***	-0.1025 (0.1302)
Money market rate	-0.0050 (0.0612)*	0.0005 (0.5769)
T-Bill rate	-0.0018 (0.0144)**	0.0003 (0.644)
Central bank policy rate	-0.0152 (0.5053)	0.0121 (0.6044)
Equity growth	0.1391 (0.079)*	0.0308 (0.7583)

Robustness checks

Table 4: Alternative bank-level indicators - Capital Adequacy

	Subsidiary	Parent bank
Total Capital Ratio	0.0058 (0.000)***	0.0005 (0.2507)
Tier 1 Ratio	0.0076 (0.000)***	0.0032 (0.6237)
Equity / Tot Assets	0.0051 (0.0461)**	0.0179 (0.0259)**
Equity / Net Loans	0.0015 (0.000)***	0.0034 (0.0015)***
Equity / Cust & ST Funding	0.0018 (0.0015)***	0.0072 (0.0645)*
Equity / Liabilities	0.0011 (0.0855)*	0.0160 (0.0186)**
Cap Funds / Tot Assets	0.0067 (0.0024)***	0.0157 (0.032)**
Cap Funds / Net Loans	0.0012 (0.0001)***	0.0028 (0.0017)***
Cap Funds / Dep & ST Funding	0.0014 (0.2378)	0.0061 (0.0446)**
Cap Funds / Liabilities	0.0022 (0.1088)	0.0140 (0.0196)**
Subord Debt / Cap Funds	-0.0010 (0.4006)	-0.0011 (0.4949)

Robustness checks

Table 5: Alternative bank-level indicators - Asset quality

	Subsidiary	Parent bank
Loan Loss Res / Gross Loans	-0.0063 (0.0963)*	0.0009 (0.6353)
Loan Loss Prov / Net Int Rev	-0.0006 (0.0299)**	-0.0006 (0.0952)*
Loan Loss Res / Impair. Loans	0.0004 (0.000)***	-0.0002 (0.0702)*
Impaired Loans / Gross Loans	-0.0099 (0.000)***	-0.0060 (0.2468)
NCO / Average Gross Loans	-0.0044 (0.1035)	-0.0007 (0.9558)
NCO / Net Inc Bef Ln Lss Prov.	0.0000 (0.7367)	-0.0003 (0.083)*
Impaired Loans / Equity	-0.0008 (0.000)***	-0.0007 (0.243)
Unres. Impair. Loans / Equity	-0.0010 (0.0001)***	-0.0022 (0.0504)*

Robustness checks

Table 6: Alternative bank-level indicators - Performance

	Subsidiary	Parent bank
Net Interest Margin	-0.0058 (0.1584)	0.0266 (0.1325)
Net Int Rev / Avg Assets	-0.0118 (0.0179)**	0.0271 (0.1753)
Oth Op Inc / Avg Assets	0.0065 (0.0303)**	0.0102 (0.3732)
Non Int Exp / Avg Assets	-0.0036 (0.3367)	0.0100 (0.3018)
Pre-Tax Op Inc / Avg Assets	0.0073 (0.2235)	0.0057 (0.7218)
Non Op Items & Taxes / Avg Ast	-0.0038 (0.5286)	0.0404 (0.2098)
Return On Avg Assets (ROAA)	0.0061 (0.3078)	0.0395 (0.0583)*
Return On Avg Equity (ROAE)	0.0010 (0.0001)***	0.0022 (0.0889)*
Dividend Pay-Out	0.0000 (0.8488)	-0.0003 (0.0281)**
Inc Net Of Dist / Avg Equity	0.0012 (0.001)***	0.0026 (0.0847)*
Non Op Items / Net Income	-0.0001 (0.4953)	0.0001 (0.1618)
Cost To Income Ratio	0.0003 (0.4456)	0.0005 (0.3623)

Robustness checks

Table 7: Alternative bank-level indicators - Liquidity

	Subsidiary	Parent bank
Interbank Ratio	0.0001 (0.1088)	0.0001 (0.4562)
Net Loans / Tot Assets	-0.0056 (0.000)***	-0.0005 (0.7101)
Net Loans / Dep & ST Funding	-0.0014 (0.0008)***	-0.0005 (0.3922)
Net Loans / Tot Dep & Bor	-0.0028 (0.000)***	0.0010 (0.3539)
Liquid Assets / Dep & ST Funding	0.0016 (0.000)***	-0.0003 (0.5057)
Liquid Assets / Total Debt and Borr.	0.0030 (0.000)***	-0.0004 (0.7661)

Robustness checks

Table 8: Sample restrictions (1)

	Baseline sample		44 countries		M&A Alternative		Unadj. loan growth rate	
	eq (7)	eq (9)	eq (7)	eq (9)	eq (7)	eq (9)	eq (7)	eq (9)
<u>Macro variables</u>								
GDP	0.7437 (0.016)**	1.3230 (0.0244)**	1.0021 (0.0858)*	1.6301 (0.0146)**	0.8998 (0.0841)*	2.1435 (0.0045)**	1.0151 (0.000)***	0.6533 (0.0996)*
Unemployment	-0.1088 (0.0047)***	-0.0378 (0.6408)	-0.0970 (0.051)*	-0.0481 (0.6179)	-0.1928 (0.0002)***	-0.2337 (0.0567)*	-0.1524 (0.000)***	-0.0452 (0.3096)
Deposit rate	-0.0031 (0.0071)***	-0.0386 (0.2521)	-0.0031 (0.1359)	-0.0470 (0.1323)	-0.0042 (0.026)**	-0.0894 (0.1143)	-0.0037 (0.0013)***	-0.0229 (0.4032)
<u>Ratios</u>								
Capital Adequacy	0.0058 (0.000)***	0.0005 (0.1636)	0.0054 (0.0001)***	0.0006 (0.1562)	0.0025 (0.0155)**	0.0007 (0.0727)*	0.0033 (0.0017)***	0.0004 (0.4917)
Asset Quality	0.0063 (0.0963)*	0.0010 (0.5866)	0.0087 (0.0499)**	-0.0005 (0.7766)	0.0102 (0.0093)***	0.0025 (0.3717)	-0.0013 (0.5517)	0.0012 (0.5881)
Performance	0.0010 (0.0001)***	0.0022 (0.0889)*	0.0006 (0.083)*	0.0037 (0.0485)**	0.0010 (0.0045)***	0.0023 (0.1033)	0.0006 (0.0389)**	0.0014 (0.0409)**
Liquidity	0.0016 (0.000)***	-0.0002 (0.613)	0.0015 (0.000)***	-0.0002 (0.735)	0.0014 (0.0001)***	-0.0006 (0.3456)	0.0014 (0.000)***	-0.0001 (0.6973)

Robustness checks

Table 9: Sample restrictions (2)

	Baseline sample		XB lending, sample with relatively more local lenders		XB lending, adjusted loan growth rates		Number of banks	
	eq (7)	eq (9)	eq (7)	eq (9)	eq (7)	eq (9)	eq (7)	eq (9)
<u>Macro variables</u>								
GDP	0.7437 (0.016)**	1.3230 (0.0244)**	0.6945 (0.0279)**	1.4042 (0.080)*	1.1366 (0.0024)***	3.0593 (0.0011)***	0.8592 (0.0114)**	1.8440 (0.0855)
Unemployment	-0.1088 (0.0047)***	-0.0378 (0.6408)	-0.1072 (0.035)**	-0.0083 (0.9381)	-0.0748 (0.1704)	-0.1739 (0.1032)	-0.1652 (0.0026)***	-0.1382 (0.3346)
Deposit rate	-0.0031 (0.0071)***	-0.0386 (0.2521)	-0.0794 (0.0001)***	-0.1287 (0.0234)**	-0.0060 (0.000)***	0.0174 (0.8159)	-0.0561 (0.0138)**	-0.1448 (0.0718)
<u>Ratios</u>								
Capital Adequacy	0.0058 (0.000)***	0.0005 (0.1636)	0.0051 (0.0004)***	0.0000 (0.9892)	0.0079 (0.0001)***	0.0010 (0.5685)	0.0088 (0.0001)***	0.0031 (0.6846)
Asset Quality	0.0063 (0.0963)*	0.0010 (0.5866)	0.0071 (0.0808)*	-0.0029 (0.6218)	0.0071 (0.0325)**	-0.0015 (0.8121)	0.0099 (0.0033)***	0.0057 (0.5076)
Performance	0.0010 (0.0001)***	0.0022 (0.0889)*	0.0018 (0.000)***	0.0007 (0.5911)	0.0011 (0.0002)***	0.0006 (0.595)	0.0013 (0.0095)***	0.0022 (0.1544)
Liquidity	0.0016 (0.000)***	-0.0002 (0.613)	0.0018 (0.0169)**	-0.0002 (0.7739)	0.0018 (0.000)***	-0.0001 (0.9043)	0.0015 (0.000)***	-0.0009 (0.2624)

Robustness checks

Table 10: Normalized variables

	Subsidiary	Parent bank
<u>Capital Adequacy</u>		
Equity / Tot Assets	0.0502	0.0309
Equity / Net Loans	0.1153	0.0893
Equity / Cust & ST Funding	0.0566	0.0331
Equity / Liabilities	0.0408	0.0327
Cap Funds / Tot Assets	0.0645	0.0333
Cap Funds / Net Loans	0.0895	0.0877
<u>Asset Quality</u>		
Loan Loss Prov / Net Int Rev	-0.0223	-0.0144
Loan Loss Res / Impair. Loans	0.0458	-0.0114
Unres. Impair. Loans / Equity	-0.0339	-0.0304
<u>Performance</u>		
Return On Avg Equity (ROAE)	0.0210	0.0142
Inc Net Of Dist / Avg Equity	0.0283	0.0140

Robustness checks

- Construction of country level data from Bankscope bank-level data (see [Table 9](#) in paper).
 - Results: broadly in line with earlier findings, fewer significant coefficients however.
- Main independent variables (macro environment and financial ratios) expressed in levels rather than deviations [from other parent banks or subsidiaries] (see [Table 10](#) in paper).
 - Result: regression results for pull factors broadly similar (magnitude and frequency), fewer push factors significant in this alternative specification.

Conclusions

- Examined the main drivers of local lending by IABs
 - Using a bank-level panel dataset (Bankscope)
 - Augmented using the BIS IBS
- Subsidiary (country) specific factors are more important determinants of local lending by IABs than parent bank (country) specific factors
- Results robust to a number of alternative specifications and data definitions
- Adjusting loan growth for FX fluctuations is crucial for obtaining meaningful results

Thank you!