Appendix

A The Regulatory Framework: History and Current Status

The US Regulatory Framework has a long and complex history. We mention here those provisions that are relevant for the treatment of banks in our model.

International Banking Act of 1978 (IBA)

The IBA instituted the principle of national treatment, subjecting foreign banks to the same regulatory restrictions and benefits as domestic banks whenever possible. Prior to the IBA, the branches of foreign banks were not subject to federal restrictions on US banks, such as those on interstate banking (McFadden) and the separation of commercial and investment operations (Glass-Steagall). Foreign branches were not required to meet the reserve requirements of the Federal Reserve. However, they were ineligible for FDIC insurance, making it hard for them to compete for retail deposits. Foreign subsidiaries were already under federal regulatory authority. The IBA required foreign banks to choose a home state, then they became subject to the laws of that state and could not set up branches or subsidiaries in any other states. They also became subject to federal laws, which ended the competitive advantages they previously had over domestic banks. Under the IBA, all foreign banks that accepted retail deposits were now required to become part of the FDIC insurance system, but they could opt out of this requirement by not accepting retail deposits. These foreign branches that accepted retail deposits were now subject to the reserve requirements set by the Federal Reserve and subject to their examinations or that of a similar banking authority.

Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980

The DIDMCA expanded the influence of the Federal Reserve to all depository institutions, as opposed to only the approximately 40 percent of banks that were currently members of the Federal Reserve System. This meant nonmember banks had to meet the reserve requirements and assets and liabilities reporting requirements set by the Federal Reserve, similar to how the IBA applied these requirements to the US operations of foreign banks. These new requirements also allowed all depository institutions to enjoy the benefits of membership in the Federal Reserve System, including use of the discount window, a first for both foreign banks and nonmember banks.

Foreign Bank Supervision Enhancement Act (FBSEA) of 1991

The FBSEA, part of the Federal Deposit Insurance Corporation Improvement Act of 1991, prohibited new foreign bank branches in the United States from having access to the FDIC system and deposit insurance. This created a major operating difference from a foreign bank opening a new subsidiary, which was still able to offer deposit insurance. The FBSEA also expanded the Federal Reserve's authority to supervise and regulate foreign banks. The Federal Reserve could now examine any foreign-owned banking entities in the United States, which were now required to be examined annually by state or federal regulators, and granted the Federal Reserve greater privilege to access information about the parent companies. The act also allowed the Federal Reserve to terminate any unsafe foreign banking entity, whether it had a state or federal licence. To form a new banking entity in the United States, a foreign bank now needed the approval of the Federal Reserve independently of the organizational choice between a branch or a subsidiary..

Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) of 1994

The IBBEA overturned the McFadden Act (1927) by allowing interstate banking. Prior to this act, many states had passed laws allowing banks based in other states to operate within their state under specified conditions. The IBBEA set up a national framework to allow interstate banking under a standardized set of rules. For foreign-owned banks, this legislation meant a parent bank could set up branches in multiple states, or a subsidiary would be allowed to open branches in multiple states.

New Intermediate Holding Company Regulation of 2016

Starting in July, 2016, a foreign bank organization (FBO) with more than $50bn in US assets is required to designate an intermediate holding company (IHC) that holds the FBO's ownership interest in any of its US subsidiaries. The IHC is then subject to the regulatory requirements of any US bank holding company. Interestingly enough, foreign branches are left out of the IHC regulation and branch assets do not count towards the regulatory thresholds, nor are branches subject to US regulatory requirements like the Dodd-Frank Act's stress testing, Basel III capital requirements, etc. Foreign branches operating in the United States remain subject to regulation in their home country.

B Data Description

US Office-Level Data

Our office-level data comes from two different forms, FFIEC 031 and FFIEC 002. FFIEC 031 is formally known as the Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices, often referred to as Call Reports. This is our source for data on the financial positions of foreign-owned subsidiaries operating in the United States. FFIEC 002 is formally known as the Report of Assets and Liabilities of US Branches and Agencies of Foreign Banks, and is our source for the data on the financial positions of foreign-owned branches.

We complement this data with the Federal Reserve Board's Structure and Share Data for US Offices of Foreign Banks. The Structure Data is US office-level data of foreign banking organizations covering selected variables from the FFIEC 031 and FFIEC 002, including the "top-tier" foreign parent bank and country, as well as US office type and assets. This source allows us to identify the two types of organizational forms that are the object of this study, branches and subsidiaries. We define uninsured federal branches and uninsured state branches as "branches." "Subsidiaries" encompass state member banks, state nonmember banks, national banks, state savings banks, and federal savings banks. The Share Data contains summary statistics on the fraction and level of total assets, commercial and industrial loans, total loans or deposits in domestic-owned banks, foreign-owned banks (subsidiaries) and foreign-owned branches and agencies.

Balance sheet data for subsidiaries in our sample come from the form FFIEC 031. Specifically, we construct retail deposits as the sum of *rconf049*, the amount of deposits (excluding retirement accounts) of $250,000 or less, and *rconf045*, the amount of retirement deposit accounts of $250,000 or less. Wholesale deposits are given by the sum of *rconf051*, the amount of deposits (excluding retirement) above $250,000, and *rconf047*, the amount of retirement deposit accounts above $250,000. The sum of wholesale and retail deposits gives our measure of total deposits. Finally, *rcfd2122* (loans and leases net of unearned income) measures total net loans.

Form FFIEC 002 provides additional information on foreign-owned branches. Specifically, wholesale deposits are given by *rcon1653* (total deposits and credit balances in transaction accounts of the branch), while *rcfd2122* (loans and leases net of unearned income) is our measure of total net loans. The intrabank transfer is computed using data on the flow of funds between parent and branches: *rcfd2944* reports the balance due to their parent institution and *rcfd2154* the balance due from their parent institution.

European Bank-Level Data

S&P Global Market Intelligence (formerly SNL Financial) is our data source on European banks. Using bank names, we were able to match this data with the European parents of US offices in the Structure data: there are 56 European "top-tier" parent banks in our matched dataset. The variables we use from S&P Global Market Intelligence are total assets (S&P Key field 132264), total deposits (132288), total net loans (132214), interest earned on loans (132532) and interest expense on deposits (133820.)

Exposure Data

Exposures for "top-tier" parent banks are contained in the European Banking Authority (EBA) stress test data, which reports the total value of each bank's holdings of sovereign debt in each European country. Only 50 of our 56 European parents participated in these stress tests. For this reason, we construct two different definitions of a parent bank's exposure to the European sovereign debt crisis . According to our baseline definition, any parent bank with above median holdings of government debt from Greece, Italy, Ireland, Portugal, or Spain is considered exposed to the crisis, while all other parent banks are not. An alternative definition considers any parent bank in a country using the euro to be exposed, while all other parent banks are not. This second definition does not require EBA stress test data.

C Additional Empirical Evidence

This Appendix reports additional evidence that supports the broad patterns that we document in the body of the paper.

Figure C.1 shows aggregate data on the population of foreign banking organizations operating in the United States.

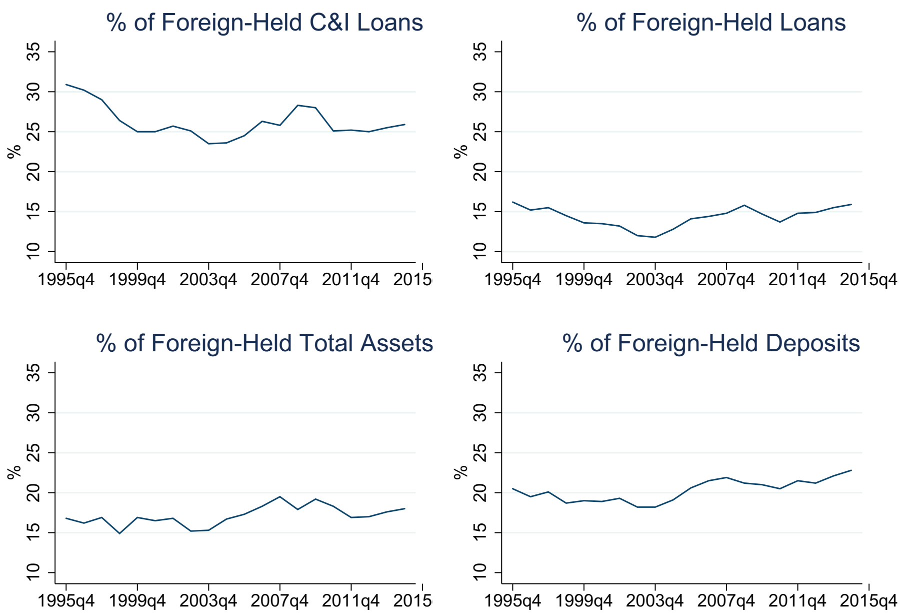


Figure C.1: **Percentage of Assets, Commercial and Industrial Loans, Total Loans, and Deposits Held in FBOs in the United States**
Source: Structure Data for US Offices of Foreign Banking Organizations - Selected Assets and Liabilities of Domestic and foreign-owned US Commercial Banks plus US Branches and Agencies of Foreign Banks.

In Section 2 we show large size differences between branches and subsidiaries of foreign banks. Figure C.2 illustrates that these size differences are not driven by a few firms holding extraordinarily large balance sheets, but hold throughout the entire distribution of banks: the deposit, loan, and asset size distributions in foreign subsidiaries first-order stochastically dominate the analogous distributions in foreign branches.

To support the model's assumption that banks "transfer" their managerial efficiency when establishing foreign operations, Figure C.3 shows that the amount of assets a foreign bank holds in the United States is positively related to its size in its home market.

Figure C.4 illustrates the evolution of intrafirm flows by bank exposure and also by home country to illustrate that banks from non-GIIPS countries were also involved in the flow reversal we document in Section 2.

The calibration analysis presented in Section 4 argues that equity of European parents broadly

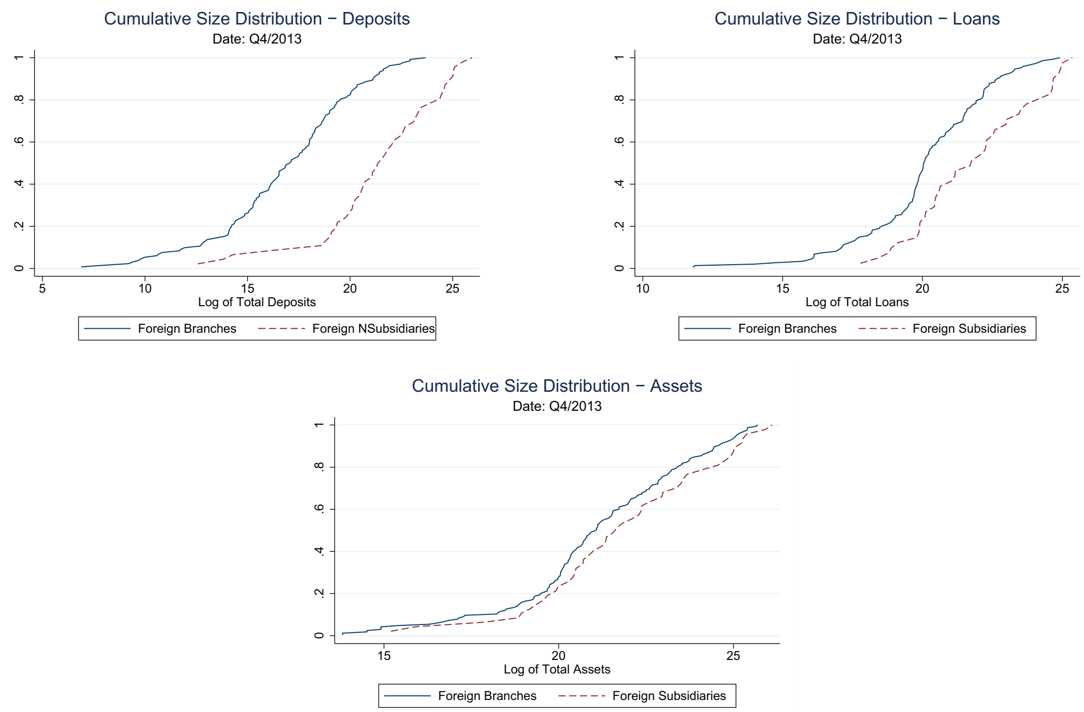


Figure C.2: **Size Distributions**
Cumulative distribution functions for deposits, loans, and assets, respectively, held in foreign-owned subsidiaries and branches in 2013:Q4.
Source: US Structure Data for US Offices of Foreign Banking Organizations - Selected Assets and Liabilities of Domestic and Foreign-Owned US Commercial Banks plus US Branches and Agencies of Foreign Banks.

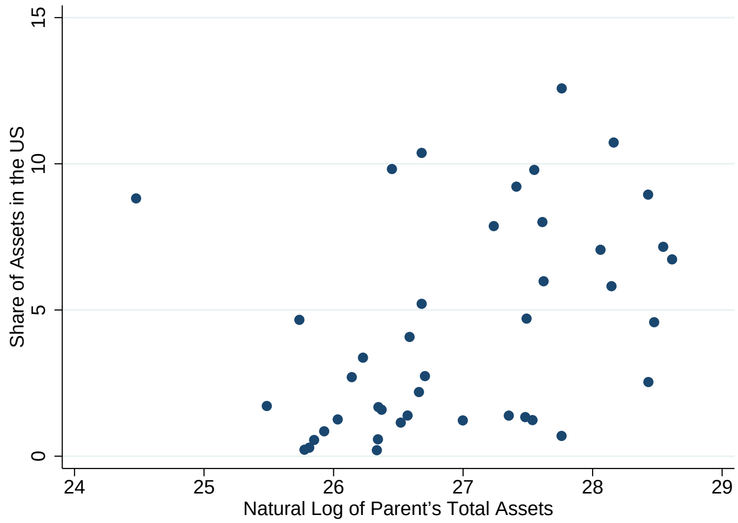
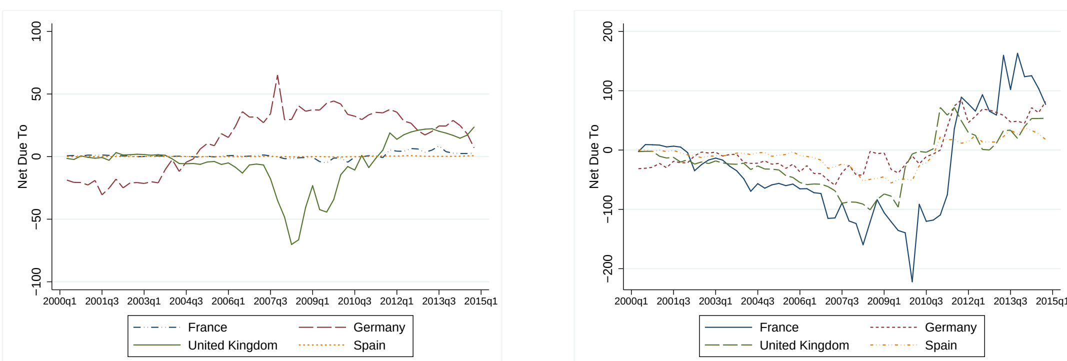


Figure C.3: **Size of Domestic versus Foreign Assets**
Share of US assets in a parent's total assets versus the parent's size.
Source: S&P Global Market Intelligence data for top-tier European parents of US branches and subsidiaries, 2013.



(a) Nonexposed Banks

(b) Exposed Banks

Figure C.4: **Net Intrafirm Flows by Country of Origin**
Difference between *Net due from related depository institutions* and *Net due to related depository institutions* (items 2 and 5, respectively, from the "Schedule RAL-Assets and Liabilities"), broken down by parent exposure and by country of origin.
Data source: Report of Assets and Liabilities of US Branches and Agencies of Foreign Banks (FFIEC 002). All values are expressed in billions.

increased after the EBA's introduction of stress testing, but fell at the onset of the sovereign debt crisis. Figure C.5 illustrates these trends.

Finally, for completeness, Table C.1 lists the European parents included in our sample from 2010, together with the number of branches and subsidiaries that each bank had at that point, and with the share of assets in each of the two organizational forms.

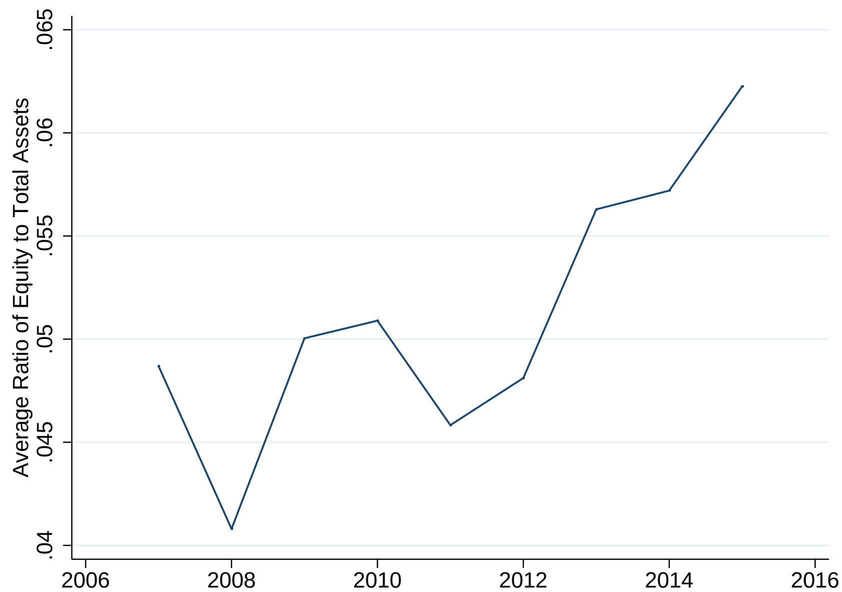


Figure C.5: **Parent Equity over Assets**
Average equity over assets held in European parents of foreign banking organizations in the United States.
Source: S&P Global Market Intelligence.

Table C.1: **List of European Parents in Our Sample, Data for 2010**

Bank Name	No. of Subs	No. of Branches	% of Assets in Subs.	% of Assets in Branches
Allianz Se	0	2	0	100
Allied Irish Banks, P.L.C.	2	1	96.11	3.89
Banco Bilbao Vizcaya Argentaria, S.A.	1	1	72.31	27.69
Banco Comercial Portugues, S.A.	1	0	100	0
Banco De Sabadell, S.A.	2	1	64.92	35.08
Banco Popular Espanol, S.A.	1	0	100	0
Banco Santander, S.A.	1	3	72.26	27.74
Barclays Plc	1	2	14.08	85.92
Bayerische Landesbank	0	1	0	100
BNP Paribas	2	5	36.15	63.85
BPCE	0	1	0	100
Caisse Federale De Credit Mutuel	0	1	0	100
Caixa De Aforros De Vigo, Ourense E Pontevedra	0	1	0	100
Caixa Geral De Depositos, S.A.	0	1	0	100
Bancaja	0	1	0	100
Caja De Ahorros Y Monte De Piedad De Madrid	1	0	100	0
Cooperatieve Centrale Raiffeisen-Boerenleenbank B.A.	1	1	12.09	87.91
Credit Agricole Corporate And Investment Bank	0	2	0	100
Credit Suisse Group	0	1	0	100
Deutsche Bank Aktiengesellschaft	2	1	26.93	73.07
Dexia S.A.	0	1	0	100
DNB Nor Asa	0	1	0	100
DZ Bank Ag Deutsche Zentral-Genossenschaftsbank	0	1	0	100
Erste Group Bank Ag	0	1	0	100
Espirito Santo Control S.A.	1	2	24.14	75.86
Fondazione Monte Dei Paschi Di Siena	0	1	0	100
Governor And Company Of The Bank Of Ireland, The	0	1	0	100
HSBC Holdings Plc	3	0	100	0
HSH Nordbank Ag	0	1	0	100
Hypo Real Estate Holding Ag	0	1	0	100
Intesa Sanpaolo S.P.A.	0	1	0	100
KBC Bank Nv	0	1	0	100
Landesbank Baden-Wuerttemberg	0	1	0	100
Landesbank Hessen-Thuringen Girozentrale	0	1	0	100
Lloyds Banking Group Plc	0	2	0	100
Niedersaechsischer Sparkassen- Und Giroverband	0	1	0	100

Continued on next page

Table C.1 – *Continued from previous page*

Bank Name	No. of Subs	No. of Branches	% of Assets in Subs.	% of Assets in Branches
Nordea Bank Ab (Publ)	0	2	0	100
Nrw.Bank	0	1	0	100
Piraeus Bank S.A.	1	0	100	0
Royal Bank Of Scotland Group Plc, The	2	4	62.66	37.34
Skandinaviska Enskilda Banken Ab (Publ)	0	1	0	100
Societe Generale	0	2	0	100
Standard Chartered Plc	0	2	0	100
Svenska Handelsbanken Ab (Publ)	0	1	0	100
Swedbank Ab	0	1	0	100
UBS Ag	1	7	32.48	67.52
Unicredit S.P.A.	0	2	0	100

D Details on the Construction and Solution of the Model

D.1 Modeling Deposit Insurance

As described in Section 3, all banks accepting retail deposits in the United States have to pay deposit insurance to the Federal Deposit Insurance Corporation (FDIC), an independent US agency, created by Congress, in charge of insuring deposits. The main goal of deposit insurance is to prevent bank runs. Deposit insurance also generates moral hazard problems—since bank deposits are insured, bankers have incentives to engage in riskier behavior. The classic way to address this moral hazard problem and ultimately reduce the risks of bankruptcies is to price the deposit insurance at the actuarially fair rate. Thus, in order to achieve a certain level of actuarial fairness, modern deposit insurance is not paid as a flat fee on insured deposits, but rather is assessed based on the risk profile of a bank's assets and funding sources. Under the Dodd-Frank Act, the FDIC assessment is applied to all assets of a bank less its tangible equity (the assessment base), so banks pay additional insurance even if their source of additional funding is not itself insured.

Small banks are classified based on their riskiness according to the CAMELS rating system of broad risk measures and assigned a risk category based on these measures.[1] Table D.1 reports the

[1] CAMELS is a supervisory rating system developed by US regulatory agencies in which capital adequacy, assets, management capability, earnings, liquidity, and sensitivity to market risk are assigned a rating from 1 (best) to 5 (worst). A rating of 5 indicates that the bank's problems are beyond management's ability to control or correct.

current rates by risk-category:

Table D.1: **FDIC Assessment Rates by Risk Categories, in Basis Points**
Source: https://www.fdic.gov/deposit/insurance/assessments/proposed.html.

	I	II	III	IV	Total
Assessment Rate	2.5 to 9	9 to 24	18 to 23	30 to 45	2.5 to 45

Larger banks and complex institutions are subject to the same total range of rates, but are assessed based on the following three factors. The CAMELS rating constitutes 30 percent of the bank's assessment rate, and the rest of the rate is calculated according to a formula based on factors related to asset risk and funding risk (50 and 20 percent, respectively). The asset risk measures generally punish higher leverage, riskier classes of assets, and asset concentration in a particular sector. The funding risk measures generally reward having a larger share of funding from insured deposits and holding highly liquid assets, on the theory that such funding is less likely to flee in crisis. These formulaic measures are similar in nature to the categories assessed subjectively in the CAMELS rating.

Our proposed reduced-form expression in equation (4) follows the principles of the FDIC Current Assessment Rate Calculator for Highly Complex Institutions, available at:
https://www.fdic.gov/deposit/insurance/calculator.html.

The highly complex institutions pricing scorecard lists three criteria as building blocks of the CAMELS rating system: 1) the ability to withstand asset-related stress; 2) the ability to withstand funding-related stress; and 3) potential loss severity. Our formulation follows the second criterion, the ability to withstand funding-related stress:

$$IP(D,L,M) = \underbrace{f_p(D, M^-, E(a))}_{\text{assessment rate}} \cdot \underbrace{(L + M^+ - E(a))}_{\text{assessment base}} \equiv \left[R_{min} + f_p \cdot \frac{M^-}{E(a)}\right] \cdot (L + M^+ - E(a)), \tag{D.1}$$

where $R_{min} > 0$ and $f_p > 0$. We abstract from the exact formulas for calculating the FDIC assessment rate, and adopt a functional form that results in an insurance premium that is higher the more that a bank resorts to the interbank borrowing as a share of bank equity in order to fund its activities. This formula applies to local banks, subsidiaries, and parents of subsidiaries. The analogous formula for parents of branches includes both parent and branch loans in its assessment base.

D.2 The Bank's Profit Maximization Problem: A Parametric Example

In order to illustrate some properties of the bank's problem, in this section we resort to a parametric example (which exploits the same parameterization we use in the calibration).

Like in the calibration, we assume a constant elasticity loan demand function: $L(r_L) = r_L^{-\varepsilon} A$, where $\varepsilon > 1$ is the elasticity of loan demand, and A is a parameter describing the aggregate size of the market for loans. Similarly, we assume a constant elasticity retail deposit supply function: $D(r_D) = r_D^{\vartheta} B$, where $\vartheta > 0$ is the elasticity of retail deposit supply, and B is a parameter describing the aggregate size of the retail deposits market. We also assume a linear separable management cost function: $C(D, L) = c_L L + c_D D$, where $c_L, c_D > 0$. The deposit insurance premium takes the functional form described in the previous section. Under these assumptions, if a local bank is a lender in the interbank market ($M > 0$), its optimal loans and deposits in the unconstrained equilibrium are given by:[2]

$$L_N^u(a) = \left\{ \frac{\varepsilon}{p(\varepsilon - 1)} [(1 - p) + r_M + ac_L] \right\}^{-\varepsilon} A \tag{D.2}$$

$$D_N^u(a) = \left\{ \frac{\vartheta}{(\vartheta + 1)} [(r_M - ac_D - R_{min}] \right\}^{\vartheta} B, \tag{D.3}$$

and maximal profits are:

$$\pi_N(a) = r_M E(a) + H_1(\varepsilon, p)[(1 - p) + r_M + ac_L]^{1-\varepsilon} A + H_2(\vartheta)(r_M - ac_D - R_{min})^{1+\vartheta} B, \tag{D.4}$$

where $H_1(\cdot)$ and $H_2(\cdot)$ are functions of model parameters only. Equation (D.4) shows that a bank's optimal profits are increasing in bank efficiency $1/a$ and in the bank's equity $E(a)$.

D.3 Constrained Equilibrium in Local Banks

In the model, the constrained equilibrium has two possible configurations, depending on whether the bank borrows or lends in the interbank market. We describe both configurations using the parameterization introduced in the previous section.

1. *Constrained equilibrium with interbank lending.*

[2] The intuition that this special example conveys is the same in the case in which a bank is a borrower in the interbank market, just less transparent algebraically.

If the bank is a lender in the unconstrained equilibrium ($M_N^u > 0$), it could be also a lender in the constrained one. In this constrained equilibrium scenario, a bank's loans to its customers and to the interbank market enter the expression for risk-weighted assets, so that $M_N^c(a) = \frac{E(a)}{\omega_M k} - \frac{\omega_L}{\omega_M} L_N^c$. Deposits adjust to clear the resource constraint: $D_N^c(a) = \left(1 - \frac{\omega_L}{\omega_M}\right) L_N^c - \left(1 - \frac{1}{\omega_M k}\right) E(a)$, while constrained loans solve:

$$\begin{aligned} L_N^c(a) \quad &= \left\{ \frac{\varepsilon}{p(\varepsilon - 1)} \left[(1-p) + \frac{\omega_L}{\omega_M} r_M + ac_L + (ac_D + R_{min}) \left(1 - \frac{\omega_L}{\omega_M}\right) + \ldots \right.\right. \\ & \left.\left. \frac{\vartheta}{\vartheta + 1} \left[\left(1 - \frac{\omega_L}{\omega_M}\right) L_N^c - \left(1 - \frac{1}{\omega_M k}\right) E(a) \right]^{1/\vartheta} B^{-1/\vartheta} \left(1 - \frac{\omega_L}{\omega_M}\right) \right] \right\}^{-\varepsilon} A. \end{aligned} \tag{D.5}$$

If the resulting $M^c > 0$, these conditions characterize the constrained equilibrium. Otherwise, the constrained equilibrium will be one that displays interbank borrowing.

2. *Constrained equilibrium with interbank borrowing.*

   If the constrained equilibrium found above is inconsistent, or if the bank is a borrower in the unconstrained equilibrium, it will also be a borrower in the constrained equilibrium.

   Under this scenario, the amount of loans is the maximum that the capital requirement allows:

$$L_N^c(a) = E(a)/(\omega_L k), \tag{D.6}$$

where deposits adjust depending on the first-order condition, and interbank borrowing clears the resource requirement:

$$M_N^c = D_N^c + \left(1 - \frac{1}{\omega_L k}\right) E. \tag{D.7}$$

D.4 Modeling the Wholesale Deposits Supply

Egan, Hortacsu, and Matvos (2017) show that the demand for uninsured wholesale deposits is less elastic than the one for insured retail deposits, and that wholesale deposits are sensitive to some measure of the banking organization "distress." We rely on their estimates and embed them in a parametric form of wholesale deposits supply that is consistent with their findings. Our model-based measure of bank distress is inversely related to the additional buffer on capital requirement that banks hold in normal times, given by equity over risk-weighted assets (RWA) divided by the capital requirement, k. When $\frac{E(a)}{k \cdot RWA} = 1$, the capital requirement is binding and the bank experiences maximum distress, resulting in a flight of wholesale deposits. Distress decreases as $\frac{E(a)}{k \cdot RWA}$ grows bigger than one.

We choose the following functional form for the demand of wholesale deposits:

$$D_w^* = (r^{*w}_D)^{\vartheta_w} \log\left(\frac{E(a)}{k \cdot RWA}\right) B, \tag{D.8}$$

where $\vartheta_w < \vartheta$ is the elasticity of wholesale deposits, and B_w is a parameter describing the aggregate size of the wholesale deposits market. This functional form implies that the quantity of deposits supplied falls as the buffer on the capital requirement decreases, and that there is a complete deposits flight ($D_w^* = 0$) when the capital requirement is binding.

For comparison purposes, Figure D.1 plots the retail deposit supply and the wholesale deposit supply for different values of the buffer on capital requirement.

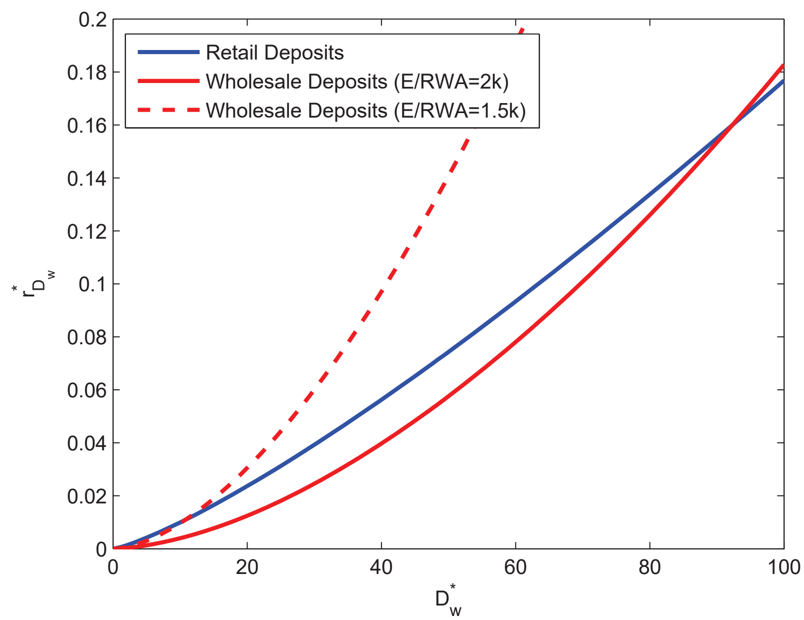


Figure D.1: **Retail and Wholesale Deposit Supply**

E Details of the Calibration Procedure

E.1 Calibrating Banks' Efficiency Distribution

We start by assessing which parametric distribution better approximates the empirical distribution of interest revenues from loans. We estimate the parameters of said distribution under these alternate assumptions: Pareto, log-normal, Fréchet, and Weibull. With the estimated distributions, we run Anderson-Darling tests of the hypothesis that each of these parametric distributions well approximates the empirical distribution. While we can reject the hypotheses that the distribution of interest revenues from loans is Pareto, Fréchet or Weibull, we cannot reject the hypothesis that the distribution is log-normal. Based on this result, we need to establish a theoretical linkage between the distribution of interest revenues from loans and the banks' efficiency distribution.

Assume that banks' efficiency $x \equiv 1/a$ is distributed log-normal: $\log(x) \sim \mathcal{N}(\mu, \sigma)$. In the unconstrained equilibrium, and under the assumption that a bank is lending in the interbank market, revenues from domestic loans are:

$$r_L \cdot L = \left[\frac{\varepsilon}{p(\varepsilon - 1)}[ac_L + r_M + (1-p)]\right]^{1-\varepsilon} A. \tag{E.1}$$

Assuming that the term $(r_M + 1 - p)$ is "small" relative to ac_L, revenues from loans can be approximated as:

$$r_L \cdot L \approx \left[\frac{\varepsilon}{p(\varepsilon - 1)} ac_L\right]^{1-\varepsilon} A = Ha^{1-\varepsilon} = Hx^{\varepsilon - 1},$$

where $H \equiv \left[\frac{\varepsilon c_L}{p(\varepsilon-1)}\right]^{1-\varepsilon} A$. Hence:

$$\log(r_L \cdot L) \approx \log(H) + (\varepsilon - 1)\log(x),$$

where $\log(x) \sim \mathcal{N}(\mu, \sigma)$ implies that $\log(r_L \cdot L) \sim \mathcal{N}(\mu_L, \sigma_L)$. As a result, the distribution of interest revenues from loans can be approximated by a log-normal distribution with parameters:

$$\mu_L = (\varepsilon - 1)\mu + \log(H) \tag{E.2}$$

$$\sigma_L = (\varepsilon - 1)\sigma. \tag{E.3}$$

The maximum-likelihood estimates, conditional on the distribution of the interest revenues from loans being log-normal, deliver $\mu_L = 5.96$ and $\sigma_L = 1.93$. Then we impose that $\mu_L = (\varepsilon - 1)\mu +$

$\log(H) = 19.78$ and $\sigma_L = (\varepsilon - 1)\sigma = 1.93$ in the calibration.

E.2 Jointly Calibrated Parameters

Table E.1 reports the parameters that are calibrated to match the moments of interest. The implied parameters of the efficiency distribution, from equations (E.2) and (E.3), are $\mu = 5.4$, $\sigma = 0.57$.

Table E.1: **Calibrated Parameters**

Parameter	Definition	Value
c_L/c_D	Unit Management Cost	12.5
ε	Elasticity of Loan Demand	4.4
A^*	Loan Demand Shifter	5.52×10^{-2}
B^*	Retail Deposit Demand Shifter	1.28×10^{5}
B_w^*	Wholesale Deposit Demand Shifter	2.31×10^{4}
F_S	Fixed Cost of Subsidiarization	167
F_B	Fixed Cost of Branching	142