(Inter-state) Banking & (Inter-state) Trade: Does Real Integration Follow Financial Integration?

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The Research Question

- Does Financial Integration lead to Real Integration?
  - Is there a trade channel to the *finance-growth nexus*?

- Our theory model:
  - Channels of bank integration that spur real integration through trade.

- Our empirical model:
  - We rely on the U.S. inter-state banking entry deregulation to estimate the “gravity model” obtained from our theory model with data from the Commodity Flow Survey.
Finance & Growth Nexus

- Finance and growth:
  - King and Levine (1993a, b)

- Channels through which finance leads to growth:

- Finance and trade (exports):
Finance & Growth Nexus

- Morgan, Rime and Strahan (MRS, 2003, 2004):
  - Financial integration & transmission of macroeconomic shocks
  - No pattern in out-of-state shipments for states that are financially integrated with the rest of the U.S.
Finance & Growth Nexus

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- Our paper: A new testable hypothesis
  - Our theory suggests an increase in trade shares for state-pairs that become financially integrated after bank entry deregulation.
  - If our theory is economically insignificant or simply wrong, we should not observe a change in trade shares as bank integration increases.
  - For ex., an easing of credit constraints alone after deregulation would increase all trade flows leaving trade shares unchanged.
Theory Model: Set-up and Intuition

- Firm

State $i$ → State $j$

State $i$ → State $k$
No bank integration between states $i$ and $k$
Theory Model: Set-up and Intuition

Type 1: successful with probability $q > 0$

Type 2: *never* successful

Bank is unable to determine the type of the project; it quotes an average (high) interest rate

No bank integration between states $i$ and $k$
Theory Model: Set-up and Intuition

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Bank integration between states $i$ and $j$

Type 1: successful with probability $q > 0$

Type 2: \textit{never} successful
Theory Model: Set-up and Intuition

The bank quotes a loan rate (lower than in the case of no information acquisition)

Bank integration between states $i$ and $j$

Type 1: successful with probability $q > 0$

Type 2: *never* successful

The bank does not lend
Implications

- Each of our channels implies (separately and altogether) that there will be higher trade flows between states $i$ and $j$ than between states $i$ and $k$. 
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- We embed this mechanism in a standard trade model with monopolistic competition and obtain a “gravity” equation:

$$\ln S_{im} = -\Theta_i + \lambda_1 \ln(I_m) - \lambda_2 \ln(P_m) + \Xi_{im} + \lambda_3 \ln(T_{im})$$
A Conservative Calibration Exercise

- The impact of the **loan price channel on trade flows**, embedded into a standard trade model with monopolistic competition, depends on:
  - the industry markups (the level of industry competition) and,
  - the fall in the marginal costs for manufacturers thanks to cheaper (appropriately priced) bank financing
A Conservative Calibration Exercise

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<table>
<thead>
<tr>
<th>Markup</th>
<th>Fall in marginal costs</th>
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<tbody>
<tr>
<td></td>
<td>1%</td>
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<td>10%</td>
<td>10.5%</td>
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<td>15%</td>
<td>6.9%</td>
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**Data**

- **The Commodity Flow Survey:**
  - We use the 1977 and 1993 surveys for the 48 contiguous states
  - 4,512 origin-destination state-pair-and-year observations
  - Problems: sampling errors that vary over time & “0” trade flows
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  - Bank deregulation dates (Amel, 2000)
  - Bank ownership from Call Reports
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- **State-level Macro data: BEA**
  - Destination-state GDP and Wage index

- **Geographic characteristics of origin-destination state-pairs**
“Regional reciprocal” deregulation mode
Bank Entry Deregulation: Michigan 1987
Bank Entry Deregulation: Michigan 1988

“National reciprocal” deregulation mode
Bank Entry Deregulation: Michigan 1989
Bank Entry Deregulation: Michigan 1990
“White” states:
Michigan deregulates towards them during the 1995 Federal deregulation
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Difference-in-Differences: Michigan up to 1993
Empirical Specifications

- **Difference-in-Differences models:**
  - Did interstate banking deregulation between origin-destination state-pairs lead to higher trade *shares* compared to non-deregulating state-pairs over time?
  - We treat interstate bank-entry deregulation as exogenous:
    - the way state-pair bank-entry deregulations took place
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\[
\ln(\text{TRADE } \_ \text{SHARE}_{imt} ) = \alpha_{it} + \beta_1 \ln(\text{GDP } \_ \text{DEST}_{mt}) + \beta_2 \ln(\text{WAGE } \_ \text{DEST}_{mt}) \\
+ \beta_3 D \_1993_t + \beta_4 D \_ \text{DEREG}_{imt} + \beta_5 D \_1993_t \times D \_ \text{DEREG}_{imt} \\
+ X \_ \text{GEOGRAPHIC } \_ \text{CONTROLS}_{im} + \epsilon_{imt}
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- But deregulation need not result in actual entry
Bank Integration: Michigan as of 1993

- 0.215%
- 1.256%
- 4.359%
- 1.775%
- 7.247%
Empirical Specifications

- **Instrumental Variable (IV) regression models:**
  - Test variable: fraction of common bank assets for a state-pair
  - Bank entry is potentially endogenous.
  - IVs as in Morgan, Strahan and Rime (2003):
    - Banking deregulation in the state-pair occurred
    - Years since deregulation (both origin and destination)
  - We test for potential identification problems.
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Difference-in-Differences Results

Coefficient estimate for D_DEREG×D_1993:

- Log-linear model with fixed-effects:

  Pooled-OLS: 0.0752 *        Within: 0.0598 (not significant)
  ➔ 7.52% increase in trade shares on average over 11 years

Sub-sample with $10 million trade flows: 3,512 observations

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- Poisson regressions with fixed effects:
  Pooled-Poisson: 0.1986 ***  
  Within-Poisson: 0.1434 ***

Sub-sample with trade flows ≥ $ 10 million:
- Pooled-Poisson: 0.1864 ***  
  Within-Poisson: 0.1414 ***
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  - Log-linear model with fixed-effects:
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- **Coefficient estimate for BANK_INTEGRATION:**
  - Instrumented as in Morgan, Strahan, and Rime (2003)

- Log-linear model (IV-GMM2S & state-pair fixed-effects):
  - “Full” sample: $7.3626 \, **$
  - “$10 million” sample: $11.0970 \, ***$
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- Identification tests:
  - Under-identification test: \(H_0\) of under-identification rejected \(✓\)
  - Weak-identification tests: \(H_0\) of weak instruments rejected \(✓\)
  - Over-identification test: joint-\(H_0\) of valid instruments & appropriate exclusion restrictions cannot be rejected \(✓\)
IV-Regression Results

- Poisson-IV model (with time-varying origin-state fixed-effects and geographical controls):

  “Full” sample: 6.5961 ***  
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If bank integration were to increase from 0% to 2.28% (the mean of the data) leads to an increase in trade shares by **15.04%**

- Poisson-IV with trade-shares
  - Highly similar results
Conclusion (I)

- We model & estimate the impact of financial barriers on trade flows:

  - For the 48 contiguous states, we find that the removal of such barriers prior to 1995 lead to approximately 14% higher trade shares between state-pairs that deregulate banking entry.

  - Actual entry that increases bank integration from 0% to 2.28% (the mean of the data) leads to 11% to 25% increase in trade on average.
Conclusion (II)

These results:

- are robust to different specifications
- are economically important
- are consistent with a 10-20% markup range and a 1-2.5% fall in marginal costs as a result of the banking deregulation.
Additional robustness checks

- Excluding state pairs with large trade shares (more than 5%)
  - Similar results as before.

  - The treated group: the state-pairs that were federally forced to deregulate
  - The control group: all the remaining state-pairs
    - Again, the treated groups’ trade shares increase relative to the control group, though they do not “catch” up with the control group shares (between 1993 and 1997).
    - This indicates the effects we study are “level” effects.