

A Gravity Model of International Lending:

Trade, Default and Credit

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***Key Idea: Mechanism to ensure Sovereign Debt Repayment
has implications for Lending Patterns***

- Few penalties for sovereign default other than reduced trade
- If trade is the penalty, then lending patterns should follow trade patterns

Theory

- Construct 3-country model of debt with 1 debtor, 2 creditors from countries with different trade patterns
- Penalty for default is proportional to trade
- Show lending is proportional to trade

Data Set

- Use annual panel data set of trade and lending
 - 20 creditors, 149 debtors, 1986-1999
 - Bank claims from BIS
 - Rest from Glick-Rose

Methodology

- Estimate “gravity” model of lending:

$$\ln(C_{ijt}) = \phi \ln(X_{ijt}) + \beta Z_{ijt} + \varepsilon_{ijt}$$

where Z are gravity variables (distance, GDP, ...)

- IV critical because of simultaneity
 - Use different instrumental variables from gravity model, especially geographic (landlocked status ...)

Table 1: OLS Estimates of Effect of Trade on Claims

	ϕ
Default	.54 (.04)
Without controls	.75 (.02)
Levels	.0001 (.00003)
Levels without controls	.0001 (.00003)
1990	.51 (.05)
1995	.53 (.07)
Only industrial debtors	.74 (.04)

Equation estimated is $\text{Claims}_{i,j,t} = \phi \text{Trade}_{i,j,t} + \beta X_{i,j,t} + \epsilon_{i,j,t}$
Robust standard errors (clustered by country-pairs) recorded in parentheses.
Intercepts and year effects not recorded.

Table 2a: IV Estimates of Effect of Trade on Claims, Geographic Instruments

	ϕ
Default	.41 (.07)
Without controls	.50 (.04)
Levels	.00006 (.00001)
Levels without controls	.00007 (.00002)
1990	.52 (.10)
1995	.40 (.10)
Only industrial debtors	1.03 (.07)

Equation estimated is $Claims_{i,j,t} = \phi Trade_{i,j,t} + \beta W_{i,j,t} + \epsilon_{i,j,t}$

Robust standard errors (clustered by country-pairs) recorded in parentheses.

Intercepts and year effects not recorded.

Instrumental variables for trade are: distance; land border; number landlocked; number island nations; log of area.

Table 2b: IV Estimates of Effect of Trade on Claims, Excludable Instruments

	ϕ
Default	.80 (.40)
Without controls	.83 (.07)
Levels	.00004 (.00001)
Levels without controls	.00005 (.00001)
1990	.59 (.37)
1995	1.13 (.49)
Only industrial debtors	.79 (.29)

Equation estimated is $Claims_{i,j,t} = \phi Trade_{i,j,t} + \beta Z_{i,j,t} + \varepsilon_{i,j,t}$

Robust standard errors (clustered by country-pairs) recorded in parentheses.

Intercepts and year effects not recorded.

Instrumental variables for trade are: common language; regional trade agreement; same nation.

Table 3: IV Estimates of Effect of Trade on Claims, Controlling for Total Claims/Debt

Control:	Total Claims	Total Debt
Default	.40 (.07)	.42 (.07)
Without controls	.42 (.04)	.27 (.04)
Levels	.00005 (.000004)	.00006 (.000002)
Levels without controls	.00005 (.000006)	.00006 (.000002)
1990	.47 (.10)	.56 (.09)
1995	.37 (.10)	.42 (.10)
Only industrial debtors	.48 (.23)	1.10 (.20)
OLS	.29 (.03)	.39 (.02)

Equation estimated is $Claims_{i,j,t} = \phi Trade_{i,j,t} + \beta W_{i,j,t} + \epsilon_{i,j,t}$

Robust standard errors (clustered by country-pairs) recorded in parentheses.

Intercepts and year effects not recorded.

Instrumental variables for trade are: distance; land border; number landlocked; number island nations; log of area.

Table 4: IV Estimates of Effect of Trade Level on Claims, Panel Estimators

Estimator:	OLS, RE	OLS, FE	IV, RE
Default	.31 (.01)	.19 (.02)	.52 (.06)
Without controls	.38 (.01)	.19 (.01)	.52 (.03)
Levels	.00003 (.000001)	.00002 (.000001)	.00006 (.00001)
Levels without controls	.00003 (.000001)	.00002 (.000001)	.00007 (.000003)
Only industrial debtors	.46 (.06)	.28 (.07)	.96 (.19)

Equation estimated is $Claims_{i,j,t} = \phi Trade_{i,j,t} + \beta W_{i,j,t} + \epsilon_{i,j,t}$

Robust standard errors (clustered by country-pairs) recorded in parentheses.

Intercepts and year effects not recorded.

Instrumental variables for trade are: distance; land border; number landlocked; number island nations; log of area.