Do Global Banks Spread Global Imbalances?
The Case of Asset-backed Commercial Paper During the Financial Crisis of 2007-2009

Philipp Schnabl, NYU Stern

(joint with Viral Acharya, NYU Stern-NBER-CEPR)

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Motivation

- What explains the geography of the financial crisis?

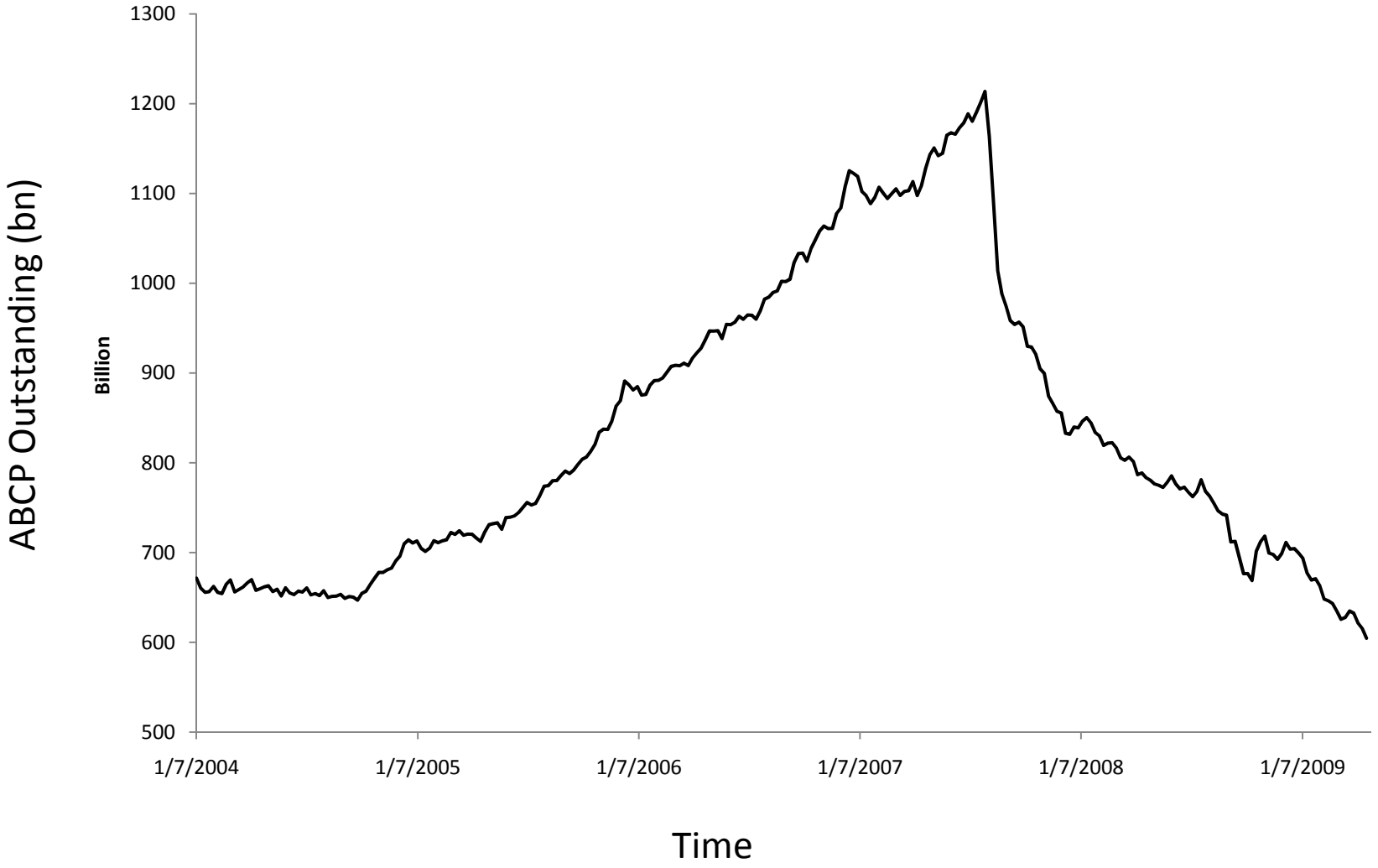
- Observe large global imbalances before crisis
  - Large capital flows from surplus to deficit countries
  - Demand for riskless assets from surplus countries
  - Global imbalances generate financial fragility in deficit countries

- But, financial crisis had immediate global impact
  - Large losses at global banks in both surplus and deficit countries
  - First bank bailouts were in “surplus” Germany

What we do?

- Analyze geography of global banks' off-balance sheet conduits
  - Conduits are structured purpose vehicles managed by large banks
  - Purchase and hold financial assets
  - Finance assets by selling Asset-backed Commercial Paper (ABCP)
- Provides window to study risk choices of global banks
  - Conduits are separate entities ("banks within banks")
- Financial crisis started with "modern" bank run on conduits in Aug 2007

Growth and decline of ABCP



Results

- Conduits invest in U.S./U.K. assets and fund themselves in USD
  - Suggests banks "manufacture" riskless assets in response to safe asset demand
  - Geography consistent with global imbalances view
- Global banks in "weakly regulated" financial systems sponsor conduits
  - Global banks in both deficit and surplus countries provide guarantees
  - Geography consistent with regulatory arbitrage
- Global banks transmit crisis to surplus *and* deficit countries
  - More exposure to conduits leads to lower bank stock returns
  - Larger effects on banks in surplus countries than deficit countries
  - Increase in U.S. dollar borrowing of U.S. subsidiaries of European banks

Outline

1. **Institutional background**
2. Empirical analysis
   - Geography of conduits
   - Event Study

Related literature

Global imbalances and safe-asset demand

- Global imbalances amplify asset bubble (Obstfeld & Rogoff, 2009)
- Global asset scarcity led to U.S. capital inflows and asset bubble (Caballero, Fahri, and Gourinchas, 2008)
- Safe asset demand creates financial fragility (Caballero and Krishnamurthy, 2009)

Securitization

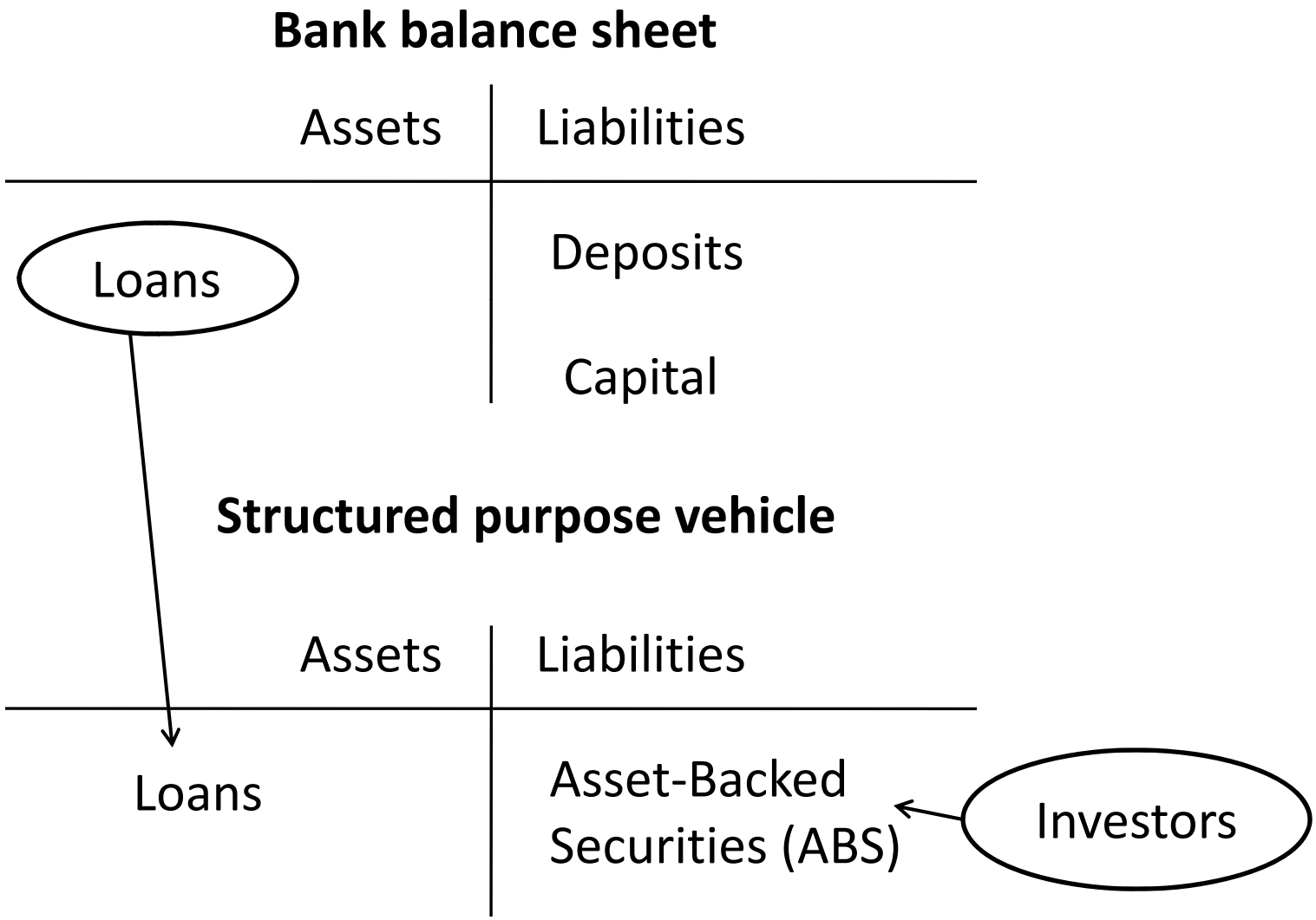
- Securitization can concentrate risk (Shin, 2009; Acharya, Schnabl, and Suarez 2009)
- Incentive problems in securitization (Dell'Ariccia, Deniz, and Laeven, 2008; Keys et al., 2009)

Traditional model: banks as delegated monitors

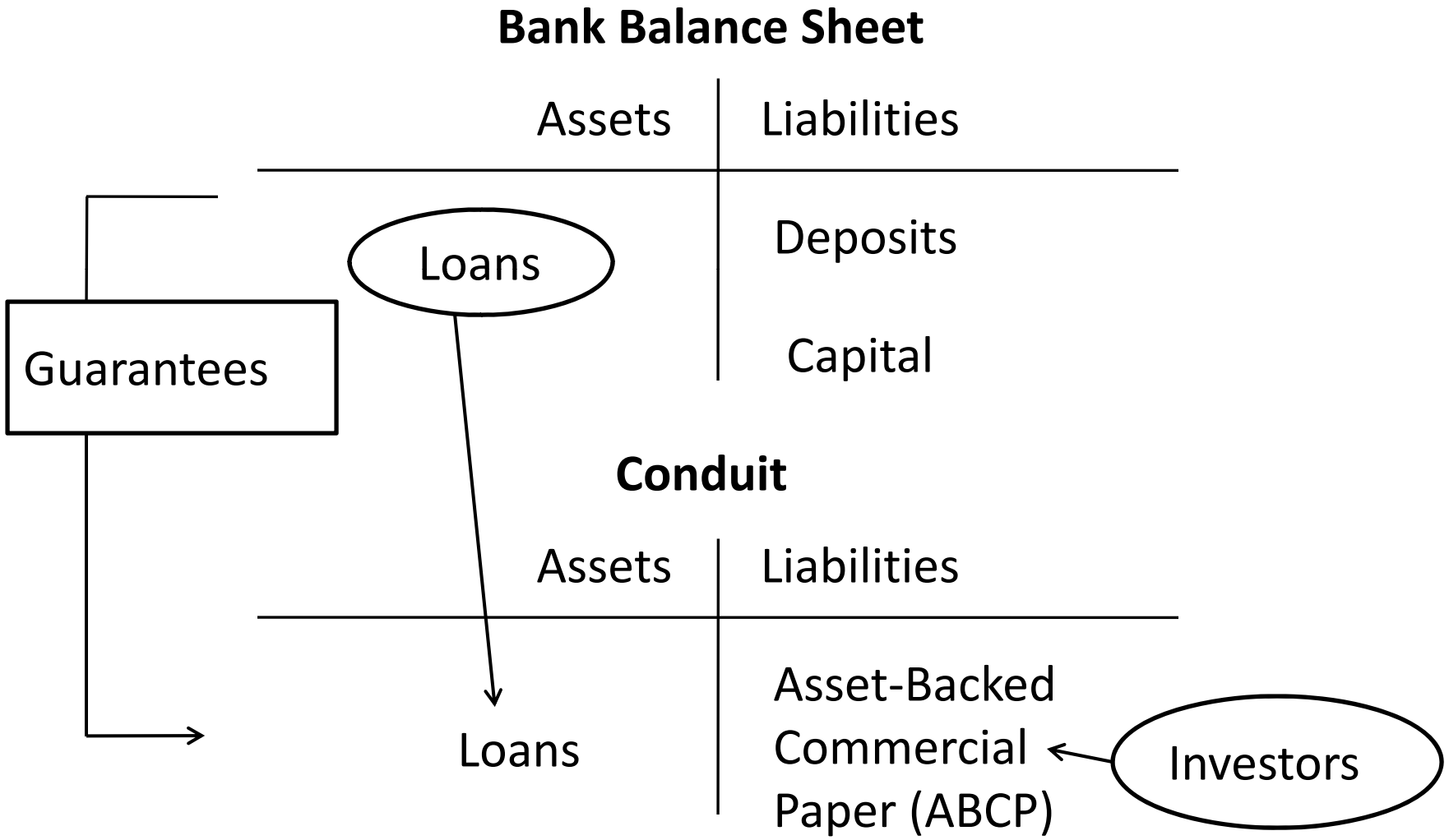
Bank balance sheet

Assets	Liabilities
Loans	Deposits
	Capital/Equity

New model: securitization



New model+: securitization w/o risk transfer



Securitization without risk transfer

	Conduit	**Other securitization (e.g., CDO)**
Assets	Medium and long-term	Long-term
Debt	Short-term (no tranches)	Long-term (tranched)
Credit Rating	Short-term	Long-term
Low risk	Via bank Guarantee	Via Tranching

Example: Conduit Balance Sheet

Ormond Quay (July 2007)

Assets		Liabilities	
Residential Mortgage-backed Securities	$6.3bn	Asset-Backed Commercial Paper (ABCP)	$11.3bn
Commercial Mortgage-backed Securities	$2.7bn		
Consumer Loans	$0.5bn		
Other	$1.8bn		
	$11.3bn	Total	$11.3bn

Guarantee by German bank Sachsen Landesbank

Short-term debt: Average Maturity < 1 Month

New Model+: Lower capital requirements

Bank

Asset	Capital Requirement (Basel 1)
Loans	8%
Guarantees	0% - 0.8%

Conduit

Asset	Capital Requirement (Basel 1)
Loans	0%

Benefits of ABCP

- Banks:
  - Fees on services
  - Maturity arbitrage ("lend long, fund short")
  - Regulatory arbitrage ("circumvent capital requirements")

  → Manufacture riskless assets without capital charge

- Investors:
  - Higher return compared to Treasuries
  - Rating satisfies Money Market Funds regulatory requirements

  → Can invest in long-term assets via "riskless assets"

Risks of ABCP

- Banks:
  - Investors may not extend ABCP ("rollover risk")
  - Banks need to provide liquidity (purchase conduit assets) and absorb credit losses on conduit assets

- Investors:
  - Need to liquidate conduit assets if bank is in default

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2. **Empirical analysis**
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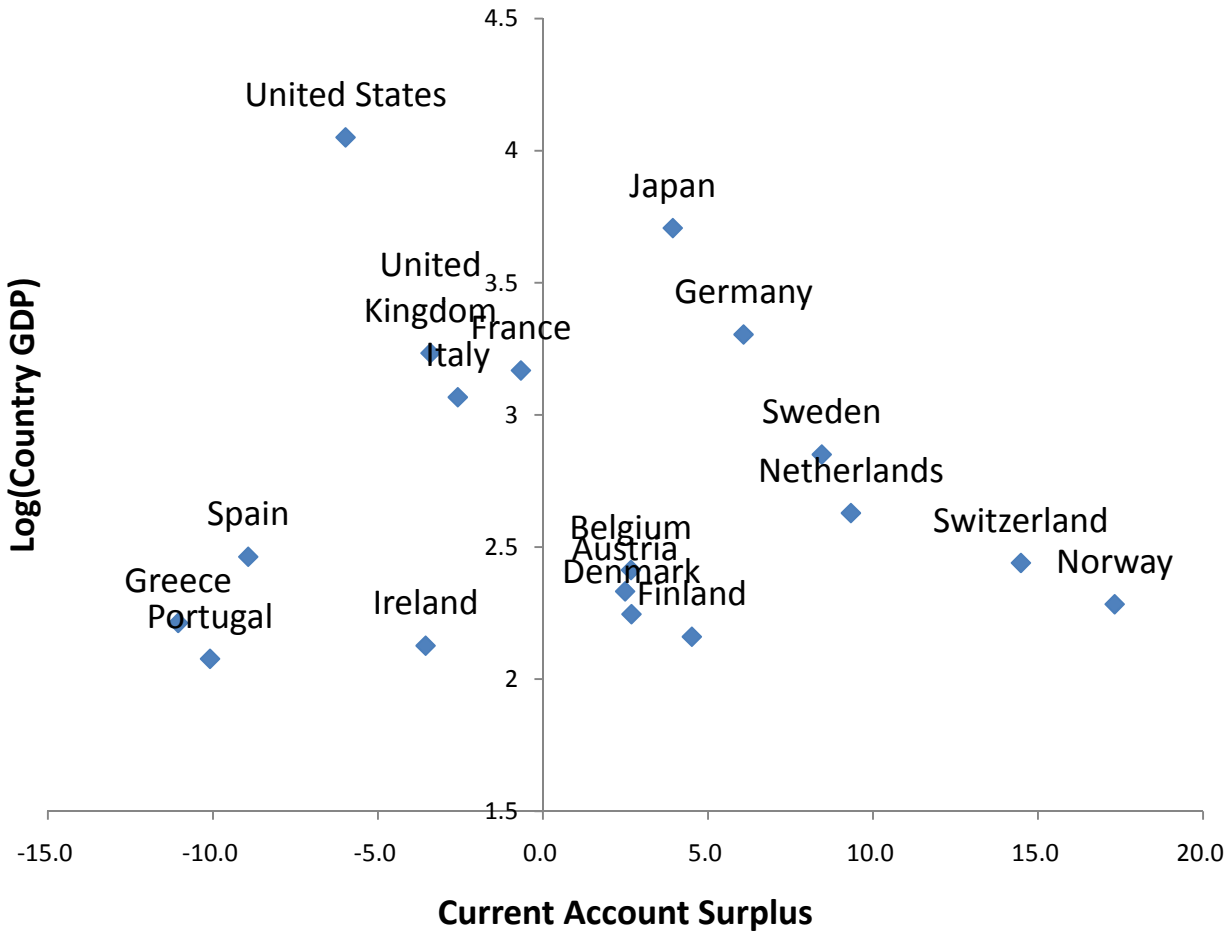
Data Sources

- Rating Agency Reports (Moody's, S&P, Fitch)
- Balance Sheet Data (Bankscope)
- Money Market Holdings (iMoneyNet, Federal Reserve Board)
- Conduit-level prices and quantities (Depository Trust & Clearing Corporation)

Global imbalances



Conduits invest in U.S. and U.K.

Conduit Name	Size (bn)	Asset Origin (%)
Grampian	37	U.S. (70.4%)
Amstel	20	Netherlands (100%)
Scaldis	18	U.S. (51.1%), U.K. (10.1%)
Atalantis One	16	U.S. (40.5%), NL (27.1%)
Thames Asset No1	18	U.K. (57.8%), U.S. (35.8%)
Solitaire Funding	15	U.S. (68.9%), U.K. (24.9%),
Stanfield Victoria	22	U.S. (96%), U.K. (2%)
Cancara Asset Sec.	15	U.S. (76%), U.K. (19%)
Cullinan Finance Limited	13	U.S. (62%), U.K. (23%)
Ormond Quay	12	U.S. (38%), U.K. (22%)

Source: Moody's ratings reports, sample only includes conduits with available data on asset origin

Conduits primarily funded in U.S. money markets

Issuing Currency		
Currency		%
USD	715	73.8%
EURO	219	22.6%
Other	35	3.6%
Total	970	

Commercial Paper Holdings by Investor Class		
Investor		%
Money Market Funds and Mutual Funds	722.5	32.6%
Funding Corporations	584.3	26.4%
Foreign Investors	226.5	10.2%
Other Investors	682.6	30.8%
Total	2215.9	

Source: Federal Reserve Flows of Funds, iMoneyNet data, Moody's data

Ten largest sponsor

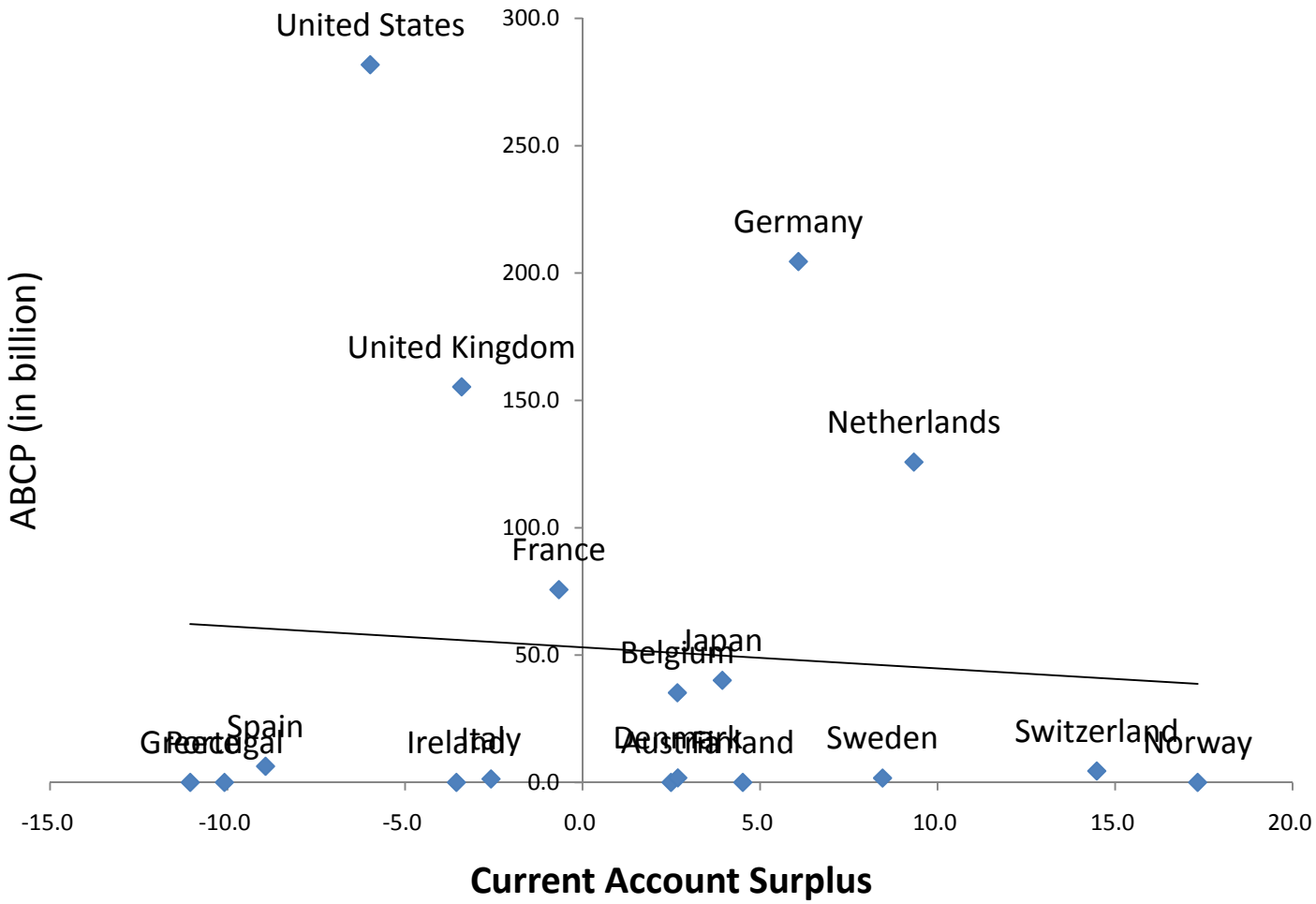
Sponsor	ABCP (bn)	ABCP/Tier1 (%)	Tier1 Ratio (%)
Citigroup (US)	92.7	102.0%	8.6%
ABN Amro (NL)	68.6	219.5%	8.5%
Bank of America (US)	45.7	50.2%	8.6%
HBOS Plc (UK)	43.9	99.7%	8.1%
JP Morgan (US)	42.7	52.7%	8.7%
HSBC (UK)	39.4	44.9%	9.4%
Deutsche Bank (GE)	38.7	125.0%	8.5%
Société Générale (FR)	38.6	87.1%	7.8%
Barclays Plc (UK)	33.1	73.2%	7.7%
Rabobank (NL)	30.7	88.3%	10.7%

Source: Moody's rating reports

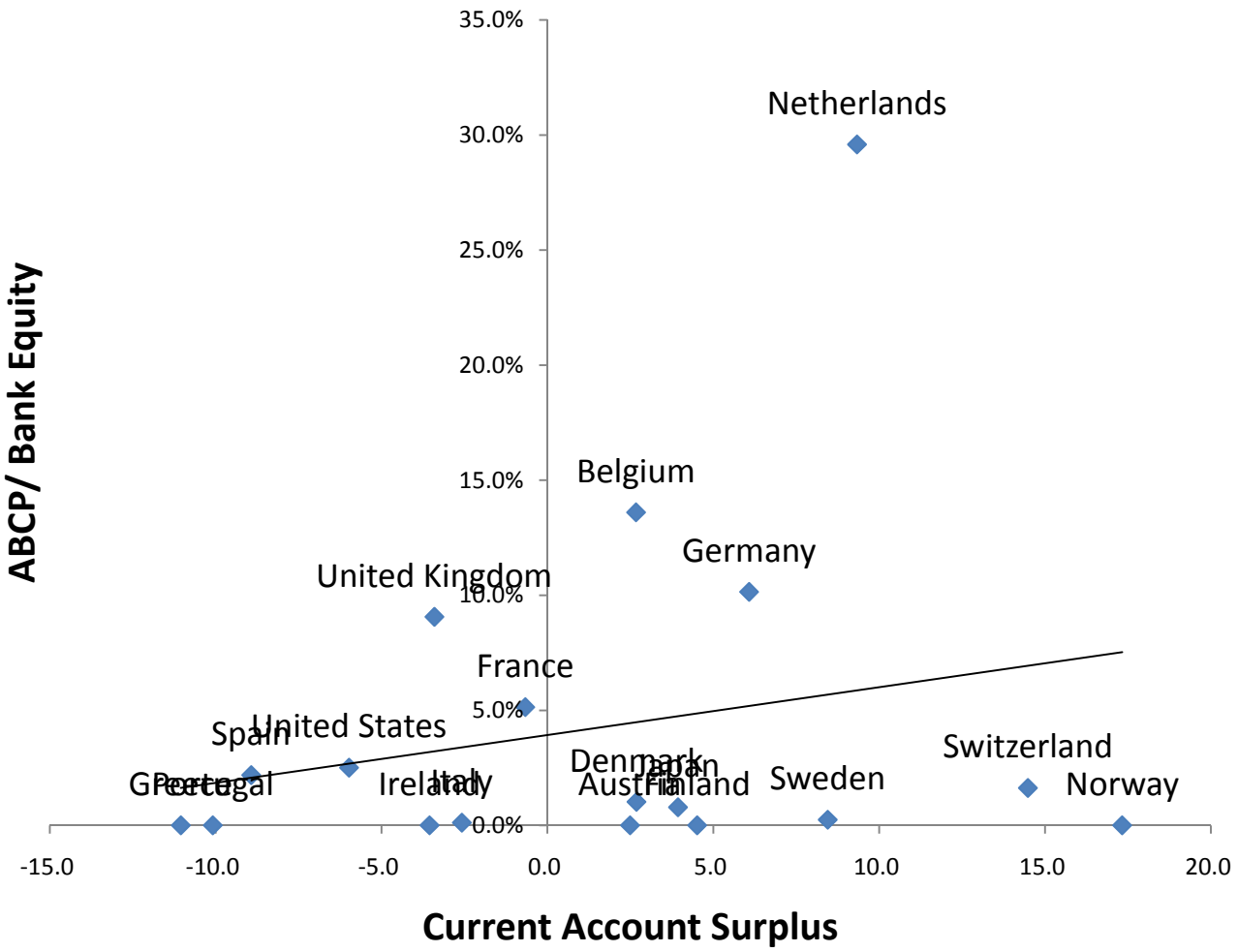
Sponsors in both surplus and deficit countries

Country	ABCP (bn)	%
United States	305.1	31.5%
Germany	204.5	21.1%
United Kingdom	158.3	16.3%
Netherlands	125.8	13.0%
France	75.7	7.8%
Japan	40.8	4.2%
Belgium	35.2	3.6%
Switzerland	13.1	1.3%
Other	11.2	1.2%
Total	969.7	

Sponsors in both surplus and deficit countries



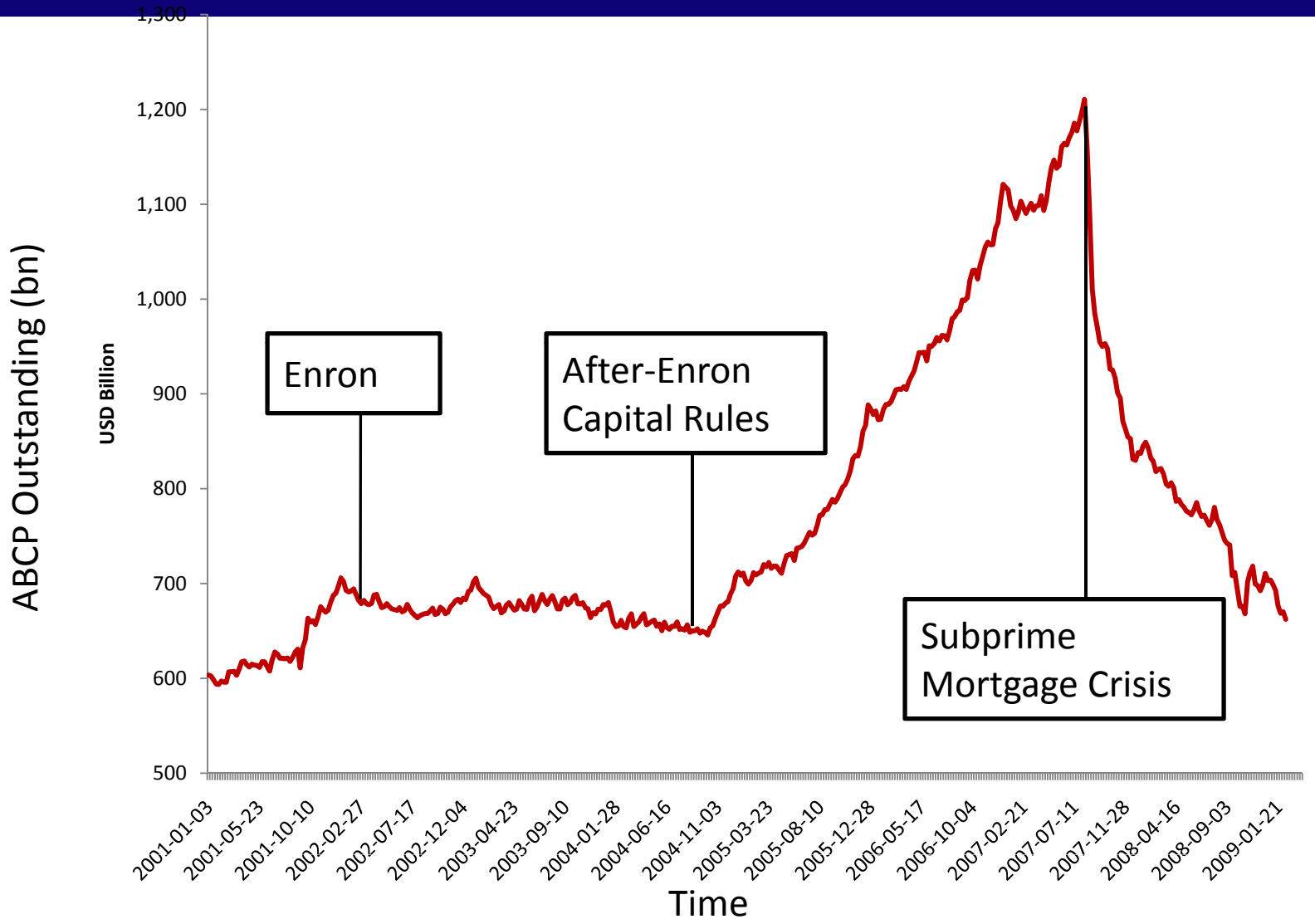
Sponsors in both surplus and deficit countries



“Weakly” regulated financial systems

Type	Capital Requirement
On-balance sheet (Basel 1)	8%
Conduits, U.S. (before 2004)	0%
Conduits, U.S. (after 2004)	0.8%
Conduits, Germany (Basel 1)	0% (+ Landesbanken Guarantees)
Conduits, Germany (Basel 2)	1.6% (+ lower risk weights)
Conduits, Spain	8%
Conduits, Canada	“Market disruption clause”

Growth and decline of ABCP



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3. Empirical analysis
   - Geography of conduits
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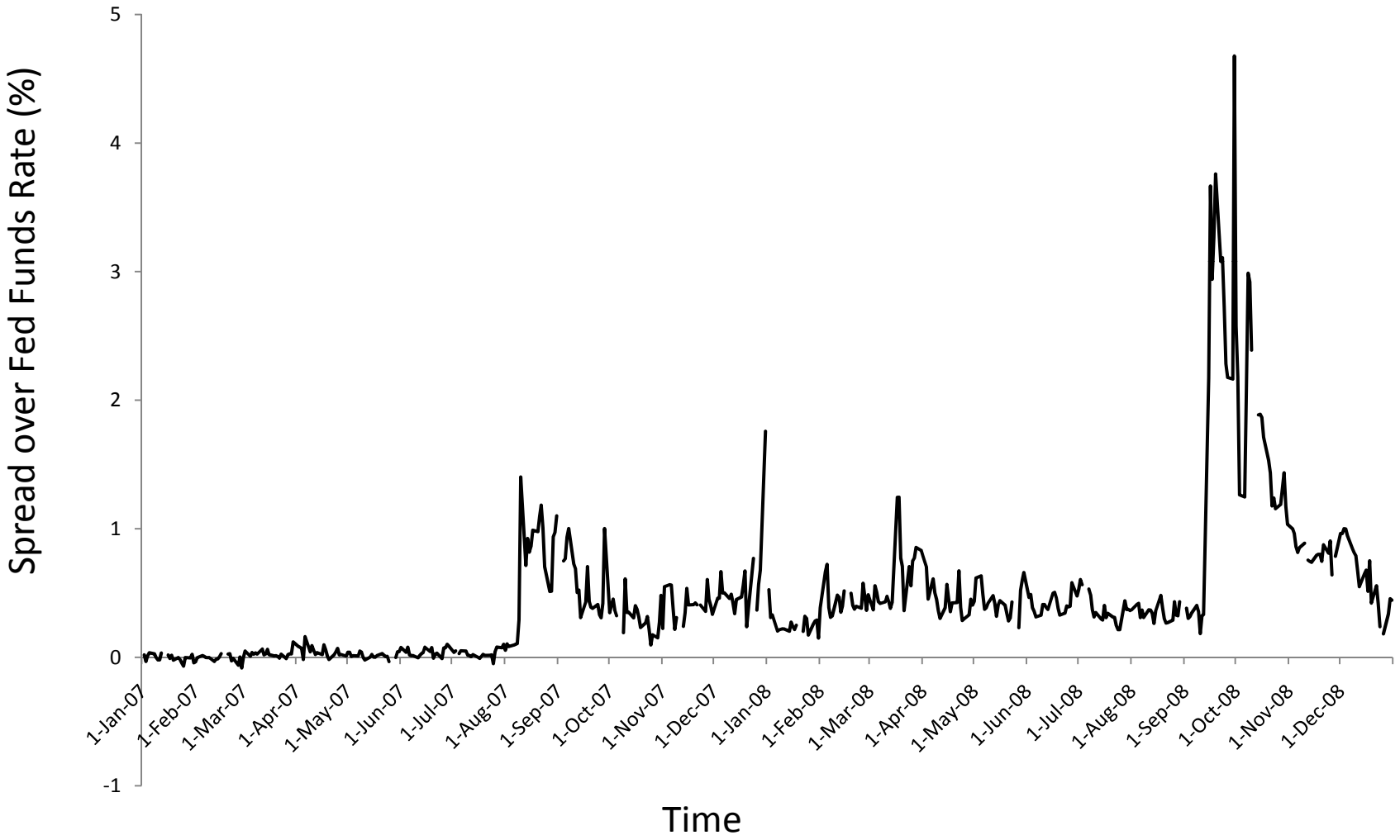
Rise in Overnight ABCP Spreads



Event Study

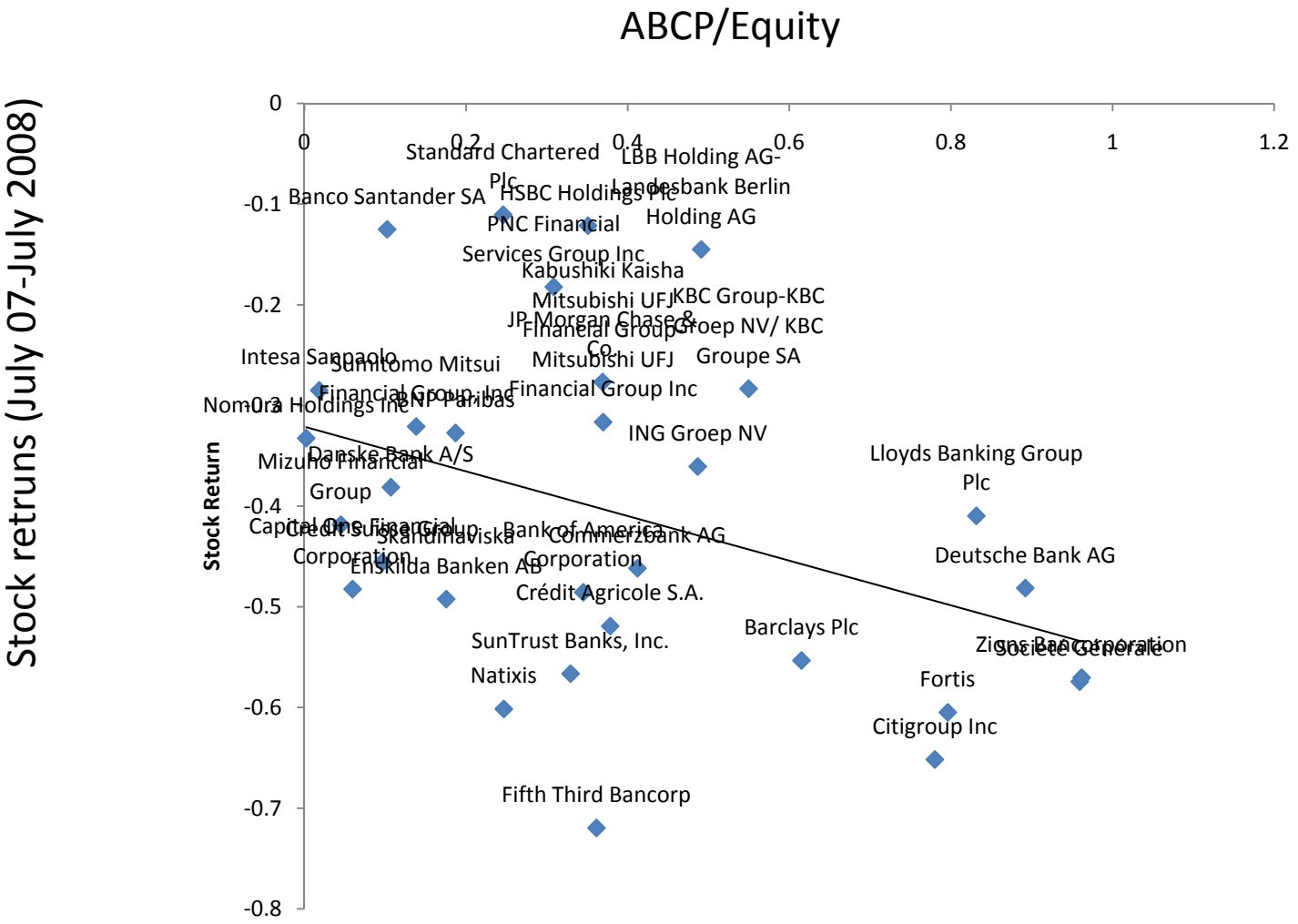
- Test whether global banks spread crisis

- Sample:
  - Start of financial crisis (August 2007)
  - Banks with assets >=$5bn in assets
  - Stock returns available

- Estimation:

$$StockReturn_i = \alpha + \beta ConduitExposure_i + \gamma X_i + \varepsilon_i$$

Banks with more conduits experience larger stock declines



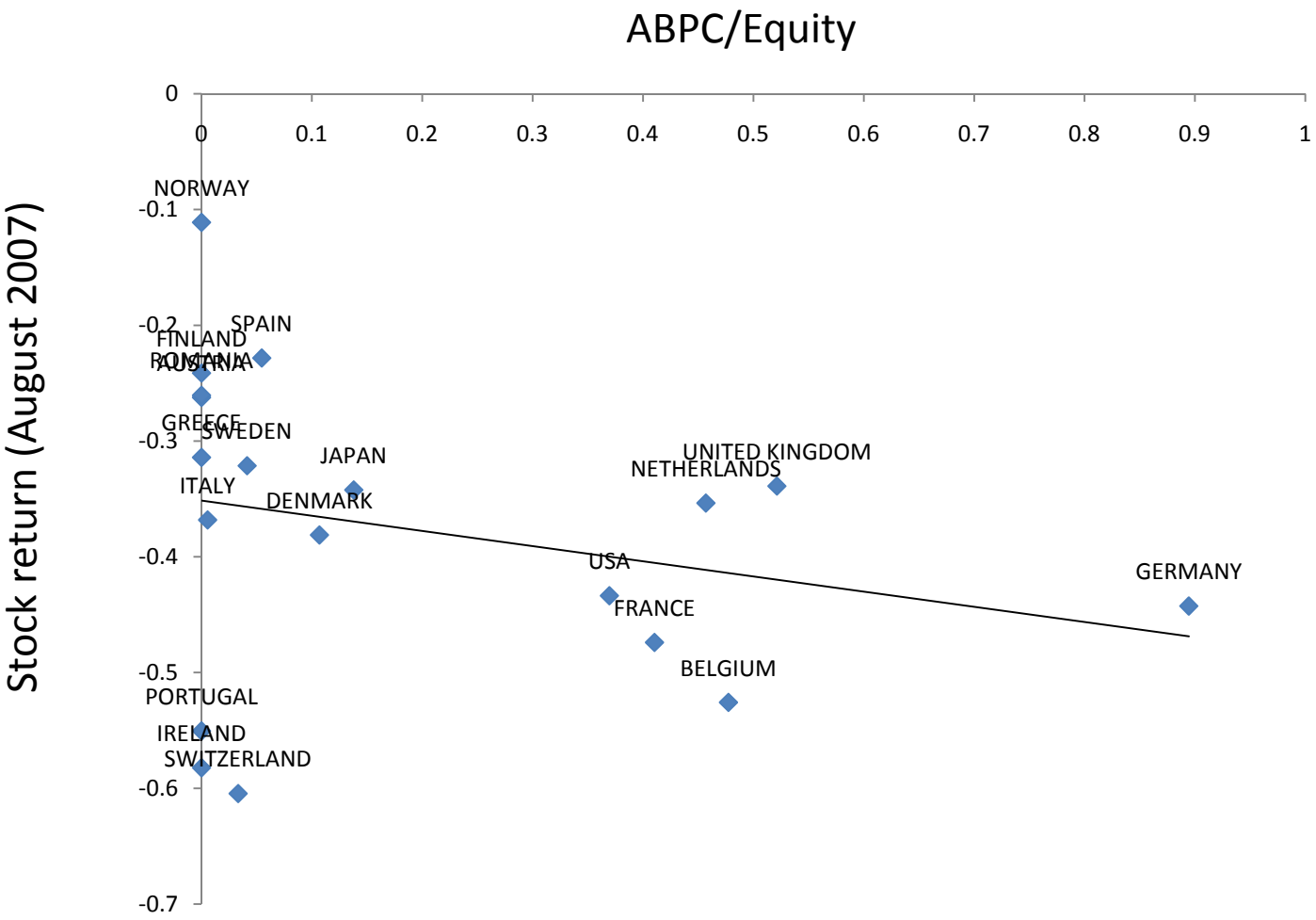
Banks with more conduits have lower returns

Dependent Variable: Stock Return (August 2007)				
	(1)	(2)	(3)	(4)
Conduit Exposure	-0.034	-0.023	-0.022	-0.029
	(0.007)**	(0.005)**	(0.008)**	(0.009)**
Size Controls	N	Y	Y	Y
Other Controls	N	N	Y	Y
Country FE	N	N	N	Y
Observations	107	107	107	107
R-squared	0.068	0.277	0.289	0.359

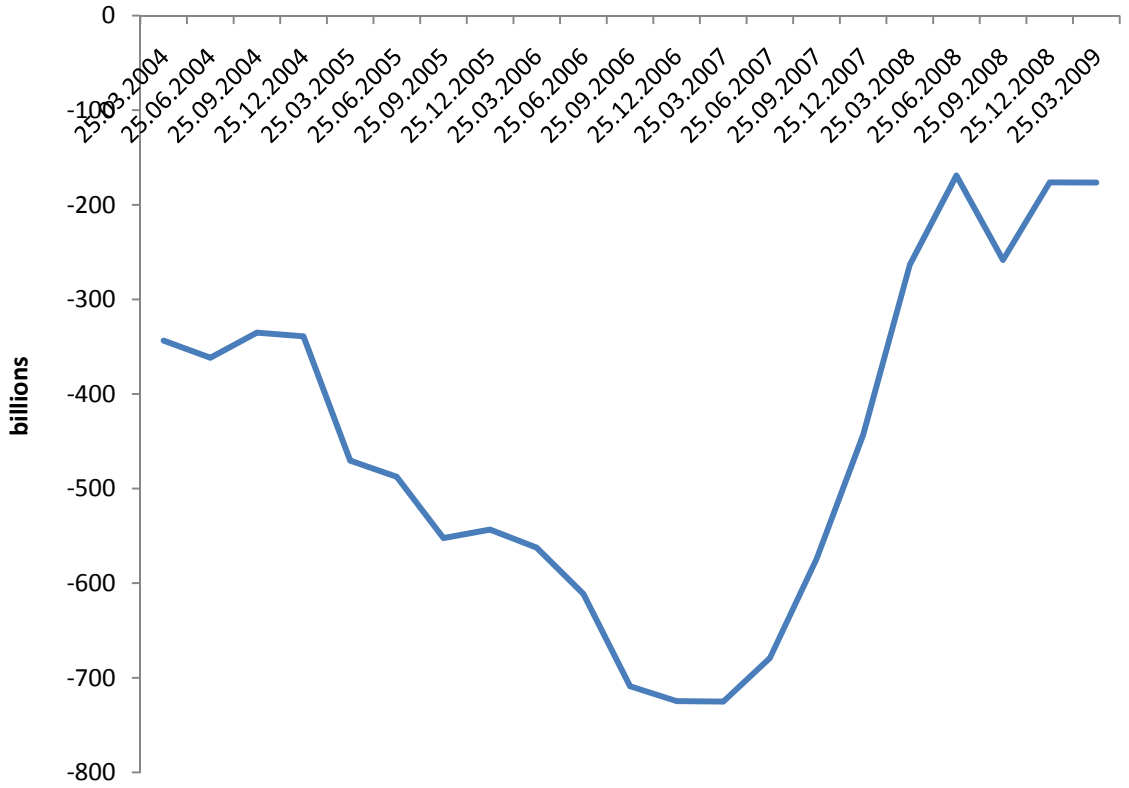
Robustness

- Robust to changes in estimation window
- Robust to restricting sample to large banks >=$50 billion
- Robust to dropping outliers (German banks) and estimating with high and low exposure indicator variables

Countries with more conduits experience larger banks stock declines



U.S. subsidiaries of European banks increase dollar borrowing



Source: McGuire and von Peter (BIS Review, 2009)

Conclusions

- Banks use conduits to “manufacture” riskless assets
  - Conduits invest in U.S. and U.K assets
  - Funded in U.S. money markets
- Weakly regulated financial system underwrite conduit risks
  - Global banks transmit financial crisis to both deficit and surplus countries
- Future research: Motivation for setting up conduits
  - Corporate governance, government guarantees

Investment strategies

Panel A: Conduits

	Total	
	# Conduits	Size
All Conduits	296	1,235.3
Conduit type		
Multi-Seller	135	548.0
Single-Seller	63	173.5
Securities Arbitrage	35	213.8
Other	63	299.9

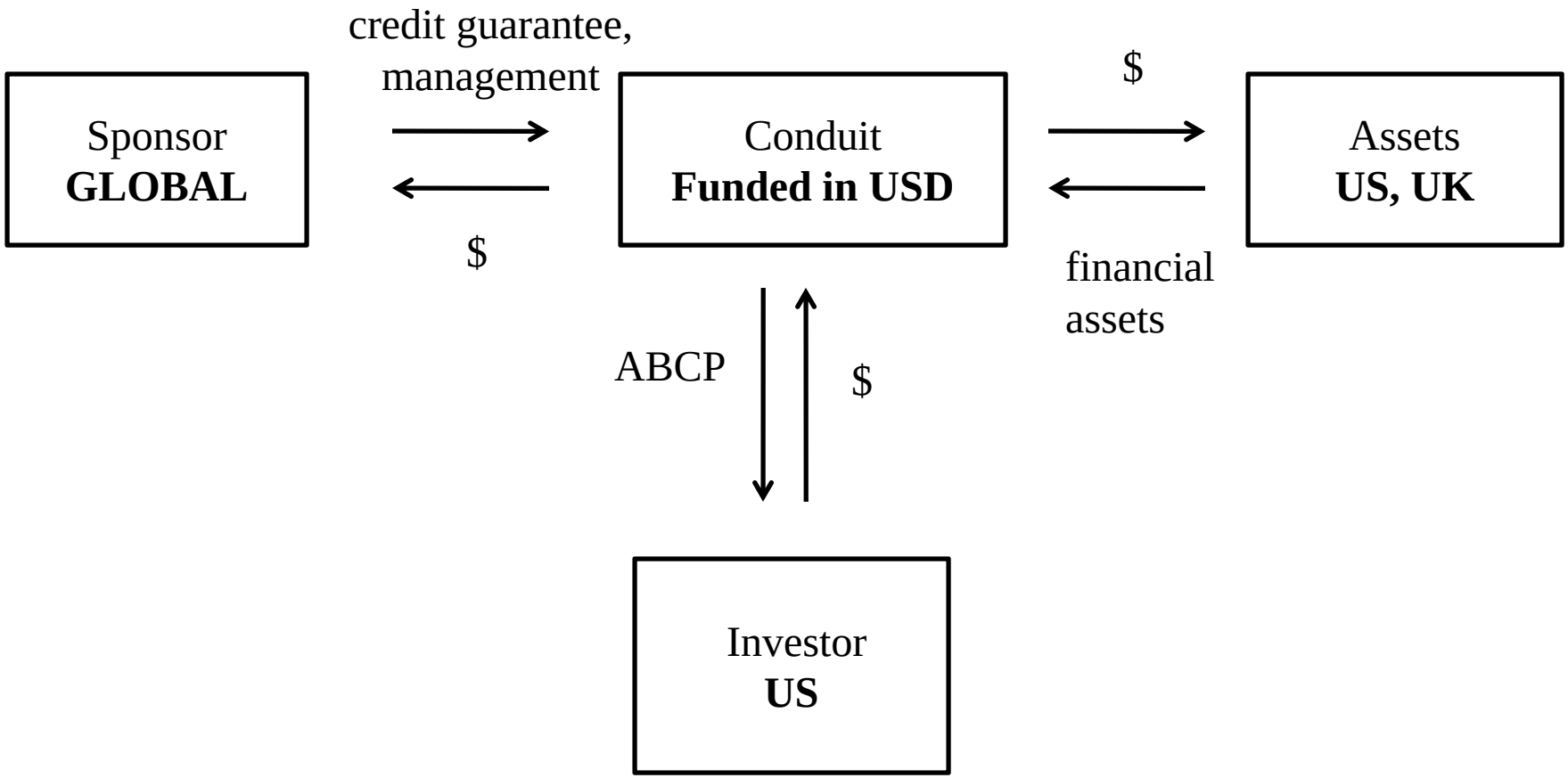
Ten largest conduits

Program Name	Sponsor	ABCP (bn)	Main Asset Type (%)
Grampian Funding	HBOS	37.9	Residential Mortgages (36%)
Amstel Funding	ABN Amro	30.7	CDO/CLO (84%)
Scaldis Capital	Fortis Bank	22.6	Asset backed securities (77%)
Sheffield	Barclays	21.4	Mortgages (43%)
Morrigan TRR	Hypo Public	18.9	Bonds (51%)
Cancara Asset	Lloyds	18.8	Residential Mortgages (43%)
Solitaire Funding	HSBC	18.5	Residential Mortgages (45%)
Rhineland Funding	IKB	16.7	CDO/CLO (95%)
Mane Funding	ING	13.7	Asset backed securities (91%)
Atlantis One	Rabobank	13.5	Commercial Loans (100%)

Results

- Banks use conduits to manufacture “riskless” assets
  - Conduits engage in maturity arbitrage (“lend long, borrow short”)
  - Structured to avoid bank capital requirements
  - Riskless to outside investors because banks assume all risks
- Global banks in “weakly” regulated financial system set up conduits
  - Conduits mostly invest in US assets financed with U.S. dollar debt
  - Debt is sold to risk-averse investors (e.g., U.S. money market funds)
  - Banks in both current account surplus and deficit countries set up conduits
- Empirical findings

Global banks as sponsors for U.S. assets



Conduits primarily funded in U.S.

	# Sponsors	Total ABCP
All Programs	126	1,235.3
Sponsor type		
Commercial Banks	64	903.3
Structured Finance	27	181.7
Mortgage Lender	16	71.1
Other	19	79.1
Country of Origin		
United States	68	488.5
Germany	15	204.1
United Kingdom	10	195.7
Other	33	347.0

Source: Analysis based on Moody's ratings reports and Bankscope data

Conduits primarily funded in USD

	Currency				
	USD	Euro	Other	Total	%
United States	302	0	3	**305**	31.5%
Germany	139	63	3	205	21.1%
United Kingdom	93	62	3	158	16.3%
Netherlands	57	66	3	126	13.0%
France	51	24	1	76	7.8%
Other	73	5	23	100	10.3%
Total (billion)	**715**	219	35	970	
%	73.7%	22.6%	3.6%		

Source: Author's analysis based on Bankscope and Moody's data