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# Contingent Liquidity Risks: The Case of Derivatives

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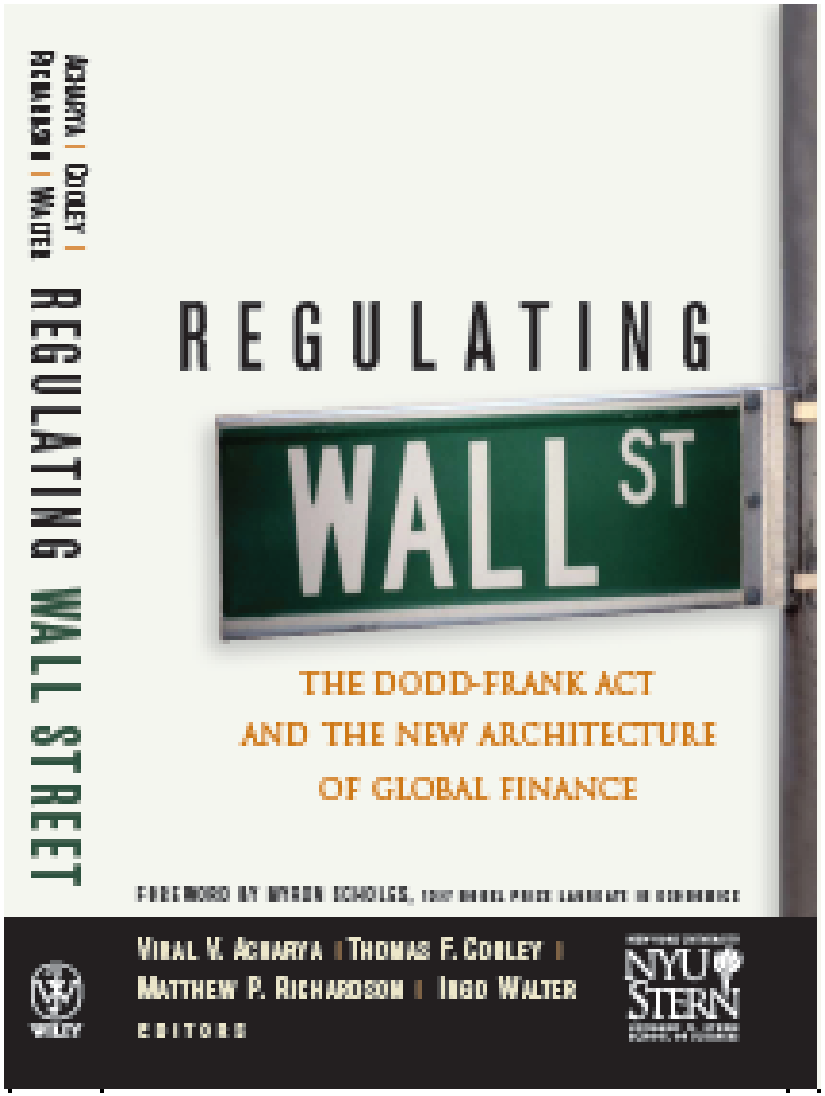

# Derivatives-linked liquidity risks

- Potential leverage offered can be infinite
- Counterparties attempt to contain leverage through bilateral collateral arrangements
- Are such arrangements adequate from a systemic standpoint?
- Do they (in fact, can they!) reflect the overall risk of the levered entity?
- If not, derivatives-linked exposures can be significant amplifiers

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# Counterparty risk externality

- Acharya and Engle (2009), Acharya and Bisin (2010)
  - B buys protection from A; C also buys protection from A; but, do B and C know the total protection being sold by A?
  - Without such knowledge, bilateral collateral arrangements cannot contain leverage build-up sufficiently
  - The externality is especially severe in opaque OTC markets
- Specific states can induce high collateral calls, a *contingent* liquidity risk
  - If dealer's risk is correlated with others, liquidation/mark-to-market risk can also arise and be significant
  - With liquidation risk, subordination of opaque OTC claims is insufficient
- Contingent liquidity risks, up to reasonable stress levels, should be calculated, registered, made transparent, and pre-funded

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# Outline of the talk

- Containing contingent liquidity risks linked to derivatives
  - Clearinghouse arrangements (but several markets will remain OTC, need to regulate CCPs)
  - Margin coverage ratios
  - Concentration limits
  - Stress tests allowing for interaction of aggregate solvency and liquidity risks
- We need to gather better and relevant data first
- We should empower both regulators and markets with such data

1. A Transparency Standard
   - Both Transparency and Standard are important
2. What do financial firms currently disclose?
   - Interesting but inadequate and poorly standardized
3. What are financial firms being asked to disclose?
   - More than before, but some relevant metrics are missing
   - Emphasis on regulatory data gathering, not on transparency

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# A Transparency Standard

# All dealers and large swap participants should report on frequent basis…

- **Classification of OTC exposures** into

- product types (such as single-name CDS, index CDS, interest rate swaps, currency swaps, commodities, equities, etc.),
- by major currency categories,
- maturity (buckets) of contracts,
- type of counterparty (bank, broker-dealer, corporation, GSE, monoline, insurance firm, etc.), and
- credit rating of counterparties.

- **Size of exposures** as

- gross (maximum notional exposure),
- in fair-value terms (to account for mark-to-market changes),
- net (taking account of bilateral netting arrangements), and
- **uncollateralized** net (recognizing collateral posted by counterparties)

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# All dealers and large swap participants should report on frequent basis…

- **Uncollateralized net exposures** should be stated also as **"potential exposures"** based on stress tests that take account of

- several notches of ratings downgrade of counterparty and its ability to post additional collateral;
- counterparty default and replacement risk assuming severe market conditions such as replacement time of 2-4 weeks
  - Liquidity risk: Level 1 product today may be Level 3 in most stress scenarios

- **Margin call reports** listing additional collateral liabilities as
- total additional liability in case the firm was to experience one, two or more (say, up to six) notch downgrades; and
- largest such liabilities aggregated by different counterparties (say, ten largest)

- **Concentration reports** providing above information for the entity's largest counterparty exposures (say, the largest ten or which account for a substantial proportion of exposure)

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# What Do Financial Firms Currently Disclose?

More than we see in Call Reports
But it is not well-standardized
It is NOT in Call Reports, Compustat, …

# Goldman Sachs:

## OTC derivatives counterparty exposure by maturity, credit rating of counterparty, netting of collateral, risk types and maturity buckets

**OTC Derivative Credit Exposure**
(in millions)

| Credit Rating Equivalent | As of September 2009 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 - 12 Months | 1 - 5 Years | 5 - 10 Years | 10 Years or Greater | Total | Netting [2] | Exposure | Exposure Net of Collateral |
| AAA/Aaa | $ 1,482 | $ 3,249 | $ 3,809 | $ 2,777 | $ 11,317 | $ (5,481) | $ 5,836 | $ 5,349 |
| AA/Aa2 | 6,647 | 12,741 | 7,695 | 9,332 | 36,415 | (20,804) | 15,611 | 11,815 |
| A/A2 | 31,999 | 46,761 | 29,324 | 31,747 | 139,831 | (111,238) | 28,593 | 24,795 |
| BBB/Baa2 | 4,825 | 7,780 | 5,609 | 8,190 | 26,404 | (12,069) | 14,335 | 8,041 |
| BB/Ba2 or lower | 3,049 | 13,931 | 2,903 | 1,483 | 21,366 | (5,357) | 16,009 | 9,472 |
| Unrated | 666 | 1,570 | 387 | 148 | 2,771 | (224) | 2,547 | 1,845 |
| Total | $48,668 [1] | $86,032 | $49,727 | $53,677 | $238,104 | $(155,173) | $ 82,931 | $61,317 |

← 40%

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# JPMorgan: Similar information but deals with better-rated counterparties

**Ratings profile of derivative receivables MTM**

| Rating equivalent | 2008 | | 2007 | |
|---|---|---|---|---|
| December 31, (in millions, except ratios) | Exposure net of all collateral | % of exposure net of all collateral | Exposure net of all collateral | % of exposure net of all collateral |
| AAA/Aaa to AA-/Aa3 | **$ 68,708** | **48%** | $ 38,314 | 57% |
| A+/A1 to A-/A3 | **24,748** | **17** | 9,855 | 15 |
| BBB+/Baa1 to BBB-/Baa3 | **15,747** | **11** | 9,335 | 14 |
| BB+/Ba1 to B-/B3 | **28,186** | **20** | 9,451 | 14 |
| CCC+/Caa1 and below | **5,421** | **4** | 357 | — |
| **Total** | **$ 142,810** | **100%** | $ 67,312 | 100% |

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# Margin Call Report:

## How much cash do firms have relative to margin risk?

# Collateral

Credit-Risk-Related Contingent Features in Derivatives

| | JP Morgan | AA to BBB: 6 notch | AA to AA-: 1 notch | Goldman Sachs | |
|---|---|---|---|---|---|
| | Collateral Posted ($bn) | Additional Collateral in Case of downgrade | | One Notch Downgrade, in $mm | 2 Notch |
| 2006-Q4 | 26.6 | | | | |
| 2007- Q1 | 27.0 | 2.6 | 0.1 | 607.0 | |
| 2007- Q2 | 28.3 | 2.9 | 0.2 | 598.0 | |
| 2007- Q3 | 32.8 | 3.2 | 0.3 | 752.0 | NA |
| 2007- Q4 | 33.5 | 2.5 | 0.2 | 595.0 | |
| 2008- Q1 | 48.5 | 3.4 | 0.3 | 957.0 | |
| 2008- Q2 | 58.2 | 3.5 | 0.6 | 785.0 | |
| 2008- Q3 | 60.1 | 4.3 | 0.9 | 669.0 | |
| 2008- Q4 | 99.1 | 6.4 | 2.2 | 897.0 | 2140.0 |
| 2009- Q1 | 82.3 | 4.9 | 1.4 | 941.0 | 2140.0 |
| 2009- Q2 | 67.7 | 4.0 | 1.2 | 763.0 | 1930.0 |
| 2009- Q3 | 66.0 | 4.4 | 1.5 | 685.0 | 1700.0 |
| 2009- Q4 | | | | | |

# AIG's collateral risk disclosure over time

| | 2007-1 | 2007-2 | 2007-3 | 2007-4 |
|---|---|---|---|---|
| **Marginal Call Reports** | | | | |
| Additional Collateral for One-notch Downgrade Rating[4] | $902 | $847 | $830 | $1,390 |
| Additional Collateral for Two-notch Downgrade Rating | | | | |
| Additional Collateral for Three-notch Downgrade Rating | | | | |
| Additional Collateral for Multi-notch Downgrade Rating | | | | |
| | **2008-1** | **2008-2** | **2008-3** | **Actual** |
| **Marginal Call Reports** | | | | |
| Additional Collateral for One-notch Downgrade Rating[4] | $1,800 | $1,200 | $1,800 | |
| Additional Collateral for Two-notch Downgrade Rating | | | $9,800 | Moody's/Fit |
| Additional Collateral for Three-notch Downgrade Rating | | | $20,000 | S&P |
| Additional Collateral for Multi-notch Downgrade Rating | | | $32,000 | Market risk |

# Cash holdings relative to margin call risk

- Goldman Sachs (4Q 2008):

Two-notch downgrade = $2bln+

Cash = $100bln+ (as of 3Q 2008, “Total Global Core Excess”)

Margin-risk coverage ratio = 50

- JPMorgan Chase (4Q 2008):

One-notch downgrade = $2bln; Six-notch = $6bln

Cash = $26bln (as of 3Q 2008)

Margin-risk coverage ratio = 4+

- A.I.G. (Q3 2008):

Two-notch downgrade = $9.8bln; Three-notch = $20bln (est), $32bln (realized)

Cash = $2.5bln in March 2008

($18.6bln post-intervention Sep 08, due to $61bln Fed borrowings)

Margin-risk coverage ratio < 1 for two-notch downgrade

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# Systemic risk: solvency-liquidity nexus

- **AIG's example illustrates that**

If a firm (dealer) becomes under-capitalized when other firms (dealers) are also under-capitalized,

Then counterparties' liquidation rights are less valuable (fire-sales);

Hence, counterparties will demand greater collateral ex post (pro-cyclical, externality, bail outs);

So prudential regulation should require

Greater upfront collateral from those firms (dealers) whose own under capitalization is greater when other firms (dealers) are under-capitalized, and who provide protection on aggregate risky claims (CDS on MBS, CLOs, etc.)

How to measure risk of joint under-capitalization?

E.g., NYU Stern Systemic Risk Rankings

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# http://vlab.stern.nyu.edu/welcome/risk

| TOP 10 | SRISK% | MES | LVG |
|---|---|---|---|
| Bank Of America | 20.4 | 3.22 | 16.16 |
| JP Morgan Chase | 13.8 | 2.72 | 11.95 |
| Citigroup | 13.8 | 2.56 | 14.34 |
| Morgan Stanley | 8.3 | 3.47 | 18.93 |
| MetLife | 6.8 | 3.24 | 15.63 |
| Goldman Sachs | 5.6 | 3.13 | 10.29 |
| Prudential Financial | 5.5 | 3.38 | 18.16 |
| American Internation Group | 4.7 | 3.55 | 10.37 |
| Wells Fargo | 4.5 | 3.09 | 7.99 |
| Hartford Financial Services | 3.9 | 4.17 | 26.27 |

# Concentration Reports?

# Crucial but not yet provided


# What Will Financial Firms Be Asked to Disclose? (Example: Dodd-Frank Act)

# "Wall Street Transparency and Accountability" part of the Dodd-Frank Act of 2010

- All existing derivative positions (both cleared and un-cleared "swaps") to be reported to a swap data repository within 180 days of its enactment
- All new positions – cleared or un-cleared – to be reported starting 90 days after the enactment (or an alternative legislated period)

- The repository will be tasked with providing data to the regulatory agencies – including foreign and international agencies, if applicable – to minimize systemic risk
- The repository will be tasked with publishing aggregate market information (trading and clearing in major swap categories, participants and developments in new products) to public twice a year

- The Act requires *real-time public reporting*, meaning "to report data relating to a swap transaction, including price and volume, as soon as technologically practicable after the time at which the transaction has been executed."
- Such public reporting will, however, not include counterparty or customer information, and will also have a delay exemption for "block trades" (to be defined by rule-makers for particular markets and contracts) taking account of the impact of disclosure of such trades on liquidity.

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# What the Act DOES NOT require?

- No mention of reporting of collateral information on trades
- Clearinghouses will clearly determine collateral requirements themselves; what about trades that remain OTC or un-cleared?

- Legislating counterparty risk transparency for regulators is good
- But should be extended in some form to markets, e.g., with a lag

- Complex positions likely to remain OTC
- Prices of new trades often not sufficient to mark old positions
- Need *potential exposure* and *collateral risk*, not just MTM values
- Risk management variables won't be collected by depository

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