

Banks' Use of Credit Derivatives and  
the Pricing of Loans:  
What Is the Channel and Does It Persist  
Under Adverse Economic Conditions?

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# Motivation

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- ▶ There is an ongoing debate about the effect of financial innovations on financial stability: **risk-sharing benefits** versus **costs of risk-taking** incentives

*“Credit derivatives [have] contributed to the stability of the banking system by allowing banks . . . to measure and manage their credit risks more effectively. . . .”*

*Alan Greenspan , 2005*

*"The boom in subprime mortgage lending was only a part of a much broader credit boom characterized by an underpricing of risk, excessive leverage, and the creation of complex and opaque financial instruments that proved fragile under stress, "*

*Ben Bernanke, 2008*

- ▶ There are potentially different channels through which financial innovations affect bank behavior
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## Effects may depend on economic conditions:

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- ▶ There is the concern that financial innovation, although beneficial under normal circumstances, are exacerbating problems in crisis times. Thus, innovations fail precisely when they are most needed
- ▶ Whether or not this is the case, is likely to depend on the channel through which financial innovations affect banks: If banks use innovations to manage risk better, they should be less affected by crisis. However, they may also become reliant on market for innovations.



# This paper

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- ▶ Study potential benefits and costs of use of credit derivatives at banks by looking at the spreads banks charge to their corporate customers
- ▶ Try to identify the channel through which loan pricing may be affected
- ▶ Compare operation of channel in normal and in crisis times.



## Channels: Financial Innovations and Loan Pricing

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- ▶ *Incentives Channel*: Banks transferring the risk have less incentives to monitor and screen their borrowers. Therefore, end up with riskier pool of borrowers (Santomero and Tester (1998), Instefjord (2005), Cebenoyan and Strahan (2004), Santos and Ashcraft (2009)). Should result in higher spreads.
- ▶ *Hedging Channel*: By hedging their exposures banks can reduce the cost of capital (Nadauld and Weisbach (2011)). Should result in lower spreads.



## Channels: Financial Innovations and Loan Pricing

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- ▶ *Capital Relief Channel*: Banks are lending constrained due to low amount of capital or liquidity. Risk transfer removes this constraint by reducing the risk of their portfolios, releasing capital to be lent (Loutskina and Strahan (2006)). Should result in lower spreads.
- ▶ *Risk Management Channel*: Banks using financial innovations can better manage their risk to adjust it to a target level. This would allow them to have lower losses and more profitability (Cebenoyan and Strahan (2004)) or/and to extend a larger volume of loans (Goderis. et al. (2007), Franke and Krahn (2005), Hirtle (2009)). Should result in lower spreads.



# Related Literature: Financial Innovation and Spreads

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- ▶ Aschcraft and Santos (2009) show that firms get higher spreads after they start being traded in the CDS market. They argue this effect is driven by less *Incentives* to monitor.
- ▶ Hirtle (2009), finds a negative relation between net position held of credit derivatives and loan spreads, arguing *Risk Management Channel*.
- ▶ Nadauld and Weisbach (2011), argue that loans that are later on part of a CLO obtained lower spreads when issued, consistent with *Hedging Channel*.



# Our approach to identify the channel

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Key idea: Distinction between the *net* position and *gross* position of CDS

- ▶ We argue that depending on the channel driving the effect of CDS on spreads, we should observe a different impact of the *net* position of credit derivatives versus the *gross* position of credit derivatives on spreads. We exploit these differences to identify this channel
- ▶ All channels except the risk management channel require taking a *net* position in credit derivatives
- ▶ Risk management can take place through *gross* positions without necessarily taking a net position:
  - A bank may buy protection on borrowers that are overrepresented and sell protection on names not contained in portfolio
  - Active use of derivatives improves risk measurement at banks regardless of whether a net position is taken.



## Predictions of the effect of CDS channels on Spreads

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<b>Channel</b>	<b>Net CD Position</b>	<b>Gross CD Position</b>
<i>Incentives Channel</i>	(+)	No effect
<i>Hedging Channel</i>	(-)	No effect
<i>Capital Relief Channel</i>	(-)	No effect
<i>Risk Management Channel</i>	No effect	(-)



# Data

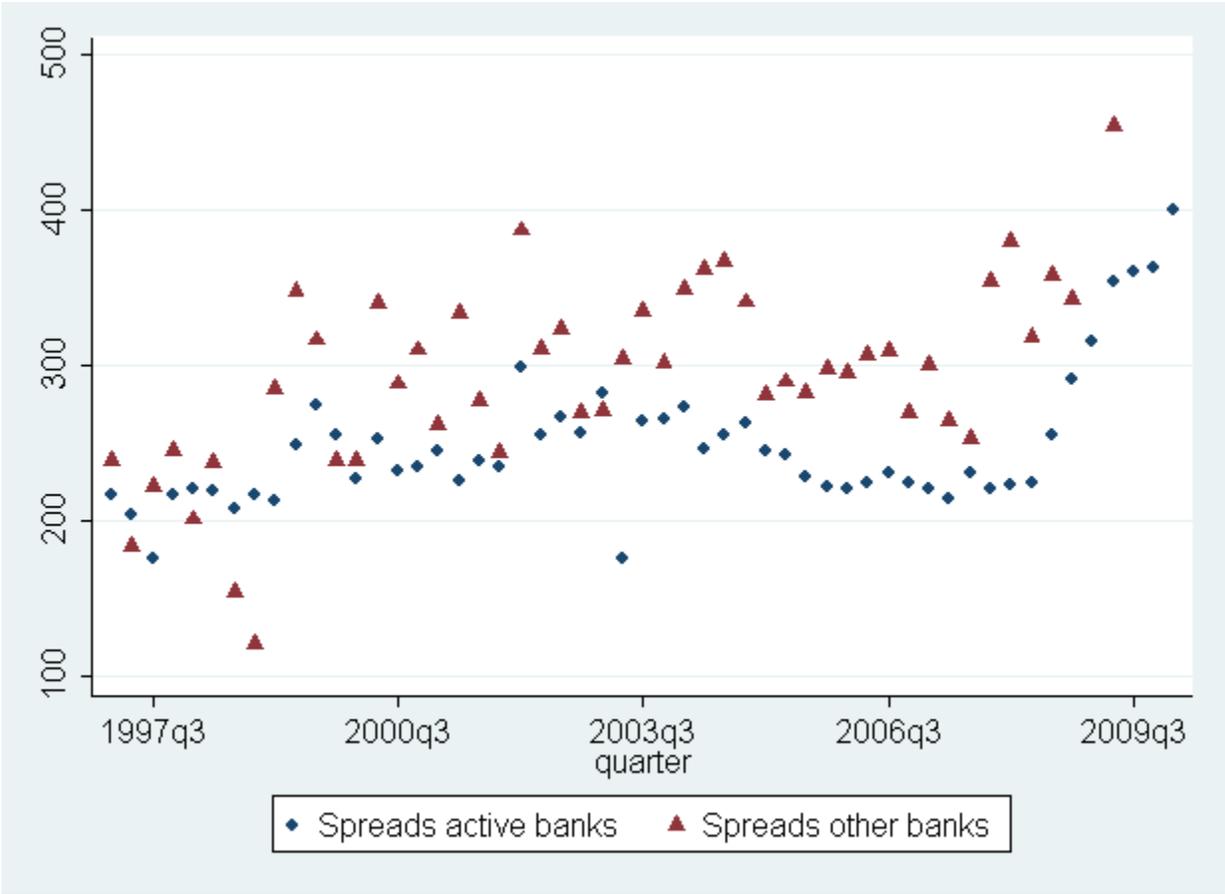
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- ▶ Individual Loan data from Loan Pricing Dealscan Database (syndicated loans)
- ▶ Match with bank data from U.S Call Reports
- ▶ Term loans with single lead arranger
- ▶ 2638 observations, 77 different banks. From 1Q97-1Q10.
  
- ▶ Dependent Variable: Spread (all-in) over Libor
- ▶ Variables of interest: Net Position/TA, Gross position/TA
  
- ▶ Loan Controls: Secured /Unsecured,  $\log(\text{amount})$ , maturity dummies. Purpose dummies: corporate purposes, acquisitions, backup line and debt repayment, other. Tranche type dummies.
- ▶ Borrower Controls:  $\log(\text{sales})$ , ticker, rated, industry dummies
- ▶ Bank Controls: ROA,  $\text{sub.debt}/\text{TA}$ ,  $\text{liquidity}/\text{TA}$ ,  $\text{charge-offs}/\text{TA}$ ,  $\log(\text{assets})$ ,  $\text{equity}/\text{TA}$ .



# CDS and Spreads

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## CDS and spreads: Baseline regressions

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VARIABLES	(1) Spread	(2) Spread	(3) Spread
net position/TA	38.12 (44.92)	13.12 (29.19)	-1.285 (28.27)
gross position/TA	-9.362*** (2.523)	-10.93*** (2.146)	
Borrower Controls	Yes	Yes	Yes
Loan Controls	Yes	Yes	Yes
Bank Controls	Yes	No	No
Year Dummies	Yes	Yes	Yes
Bank Fixed Effects	No	Yes	Yes
Observations	2,559	2,638	2,638
R-squared	0.362	0.398	0.396

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

- Evidence for risk management channel: Gross position significantly negative. No effect through net position.

- Economic effect is also significant: One standard deviation increase in Gross/TA leads to a decrease in 8.9 bp on spreads.



# Identification of risk management effect

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- ▶ CDS use may be correlated with other risk management tools
  - Control in regression for other derivatives used for hedging
  
- ▶ Endogeneity:
  - Risk-loving bank may simultaneously underprice in lending market and buy protection in CDS market
  - Or: bank that has good lending opportunities may have low lending rates and hedge additional risk using credit derivatives.
- ▶ However, this endogeneity operates through the net amount!
  
- ▶ Any remaining endogeneity:
  - IV approach with derivatives used for trading as instruments: Trading derivatives typically precedes hedging with derivatives and it is unlikely that trading has an independent effect on loan pricing
  - Contemporaneous endogeneity: lag CDS positions



## The effect of CDS on Spreads

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VARIABLES	(5) Spread	(6) Spread	(7) Spread
net position/TA	12.39 (29.16)	11.66 (45.09)	
gross position/TA	-10.75*** (2.120)	-9.817** (4.576)	
derivatives not for trade/TA	2.602 (9.008)		
net position/TA lag			-9.598 (22.22)
gross position/TA lag			-12.17*** (3.735)
F-stat IV		613.08	
J-test p-value		0.356	
Borrower Controls	Yes	Yes	Yes
Loan Controls	Yes	Yes	Yes
Bank Controls	No	No	No
Year Dummies	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes
Observations	2,638	2,638	2,322
R-squared	0.398	0.398	0.385

- Results hold when controlling for possible bias from general sophistication in hedging

- Results unchanged when instrumenting the gross position to account for possible unobserved supply factors jointly determining both spreads and CDS usage

- Results robust for when we control for contemporaneous endogeneity problems.

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## Risk management benefits and borrower types

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- ▶ By comparing effects for different types of borrowers we can understand better the channels through which risk management affects loan pricing
- ▶ We find that borrowers that are likely to be actively traded in the CDS-market (large investment grade companies) benefit significantly more from banks' CDS use (44 bps reduction per one stdev gross position)
- ▶ Interestingly, we also find that risk management benefit also extends to unrated borrowers, which are unlikely to be traded in CDS market (the impact is similar to the overall pool of firms)
- ▶ This suggests that risk management using CDS leads to *general* reduction in the cost of risk-taking at banks. It may also reflect pseudo-hedging.



# CDS and Spreads during the crisis

Variables	(1) spread	(2) spread
crisis	42.28*** (13.70)	44.21*** (14.28)
gross CD/TA		-12.29*** (2.007)
gross CD/TA*crisis		0.325 (3.307)
net CD/TA		
net CD/TA*crisis		
gross CD 07/TA*crisis		
Borrower Controls	Yes	Yes
Loan Controls	Yes	Yes
Year Dummies	Yes	Yes
Bank Fixed Effects	Yes	Yes
Observations	4,022	2,596
R-squared	0.417	0.389

- Spreads have increased across the board, also for banks using CDS

- The benefits from risk management persist after the onset of the crisis and do so with a similar magnitude

## How do risk-management banks compare to others?

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- ▶ We would expect banks which successfully manage their risk may experience lower loan charge-offs
- ▶ Their charge-offs should also not increase (relative to other banks) under adverse economic conditions
- ▶ We would also expect these banks to be less likely to be lending constrained in recessions



# CDS and Banks performance

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- ▶ Call Reports Data
- ▶ Bank yearly averages. From 2006-2010.
- ▶ 2243 observations, 1117 different banks.
  
- ▶ Dependent Variables:
  - $(\text{Net Charge-offs commercial loans} - \text{CDS gains})/\text{TA}$
  - $\text{Commercial Loans}/\text{TA}$
  
- ▶ Bank Controls:  $\text{Sub. Debt}/\text{TA}$ ,  $\text{liquidity}/\text{TA}$ ,  $\text{equity}/\text{TA}$ ,  $\log(\text{assets})$ ,  $\text{total Loans}/\text{TA}$ ,  $\text{commercial loans}/\text{TA}$ ,  $\text{ROA}$ .



# CDS and Banks performance

VARIABLES	(1) charge-offs commercial/TA	(2) commercial loans/TA
crisis	0.000375*** (4.95e-05)	-0.0322** (0.0128)
gross position/TA*crisis	0.115 (0.115)	52.44*** (20.29)
gross position/TA	-0.259** (0.103)	-7.783 (19.62)
Bank Controls	Yes	Yes
Observations	2,243	2,243
R-squared	0.355	0.138

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

- On average all the banks experienced larger losses after the crisis.
- Banks managing their risks face lower losses and they do not suffer differently during the crisis period.
- On average banks cut their lending after the crisis.
- Bank managing risk were less lending constrained during the crisis. They kept a more stable flow of loans extended.



## Conclusion

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- ▶ We find that banks' use of credit derivatives lowers corporate loan spreads. The relation exists for banks' *gross* credit derivatives position (but not for their *net* position)
- ▶ We argue that these results are consistent with banks passing on risk management benefits from derivatives use to borrowers but not with other channels through which credit derivatives may influence loan pricing
- ▶ Risk management benefits are larger for firms more likely to be actively traded but also present for firms unlikely to be traded
- ▶ Risk management benefits persist during the crisis.
- ▶ Bank-level analysis is also consistent with risk management benefits that persist in crisis times: Banks using CDS generally have lower charge-offs on loans and face smaller contractions in lending volumes during the crisis.

