The Strategic Under-Reporting of Bank Risk

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Motivation

Risk measurement is central to financial-sector regulation.

- Banks are complex.
- Risk is not perfectly observable to outsiders.

Banks need to self-report their risk, which influences

- capital requirements
- market participants' risk-assessment

This Paper

Main Questions:

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Empirical Setting:

- Focus on the bank's trading book.
- Banks self-report their trading book's Value-at-Risk (VaR) to the regulators.

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Empirical Setting:

- Focus on the bank's trading book.
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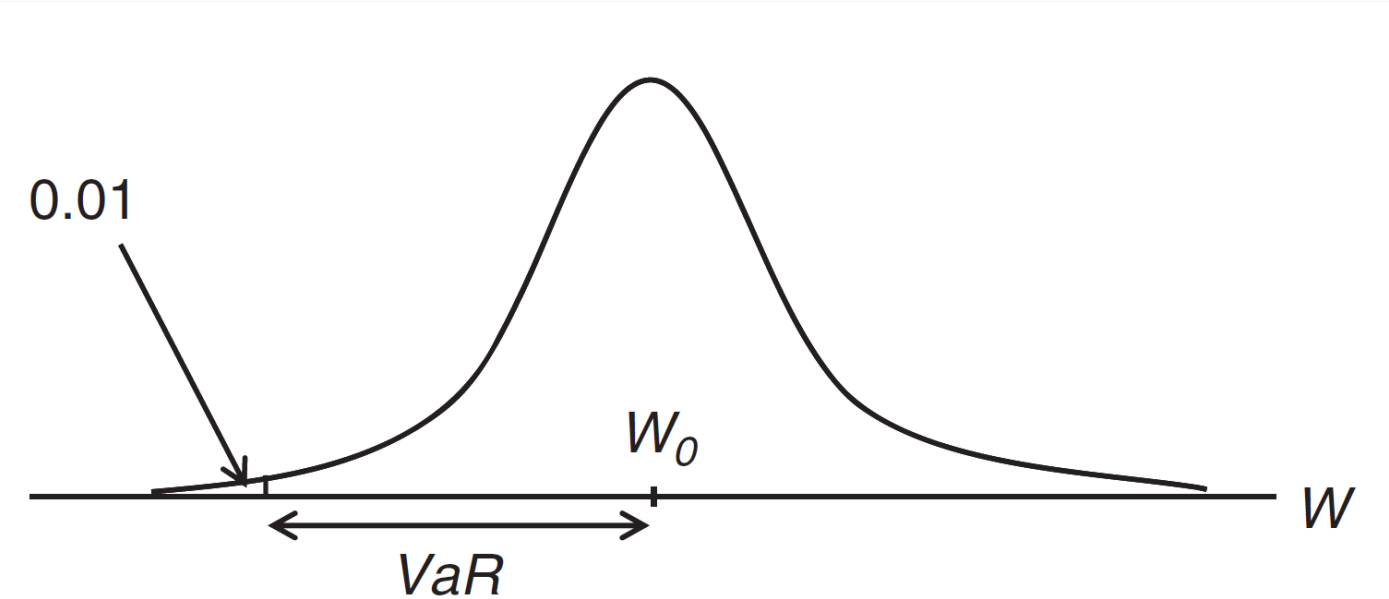
The Under-Reporting Tradeoff:

- Lower *current* capital requirement, but potentially higher *future* capital capital requirement.

Value-at-Risk Modeling



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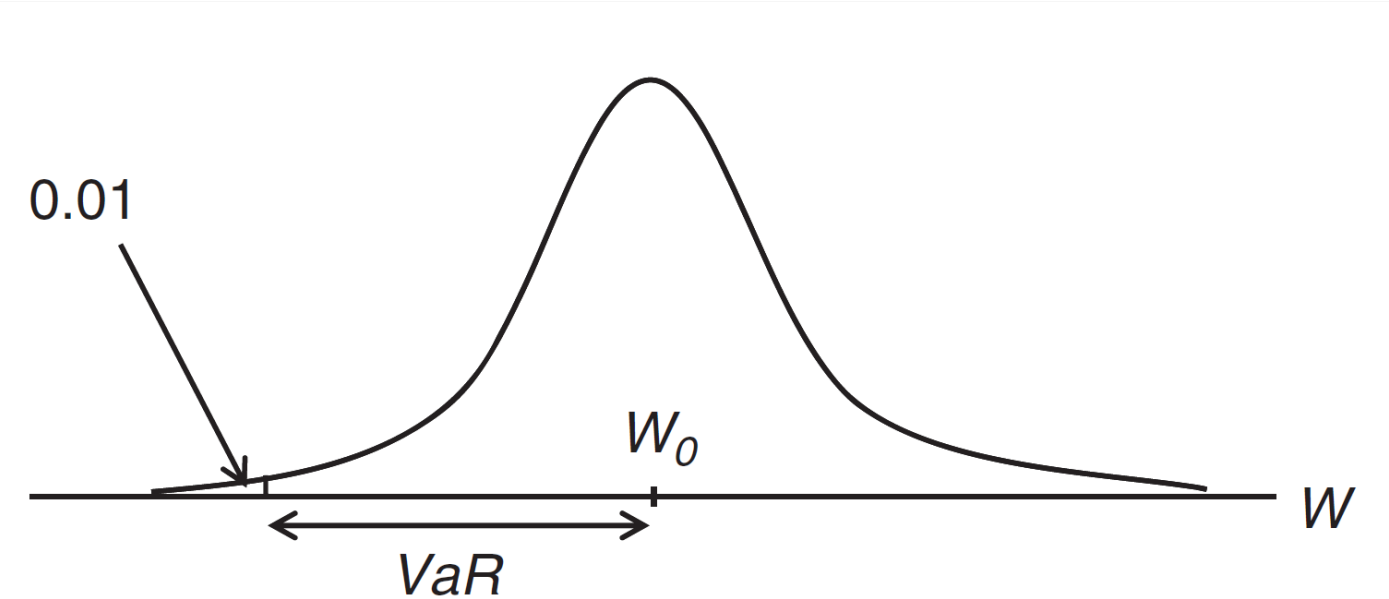

- Typical trading portfolio has its largest risk exposures to:
  - interest rates
  - equities
  - foreign exchange
  - commodities

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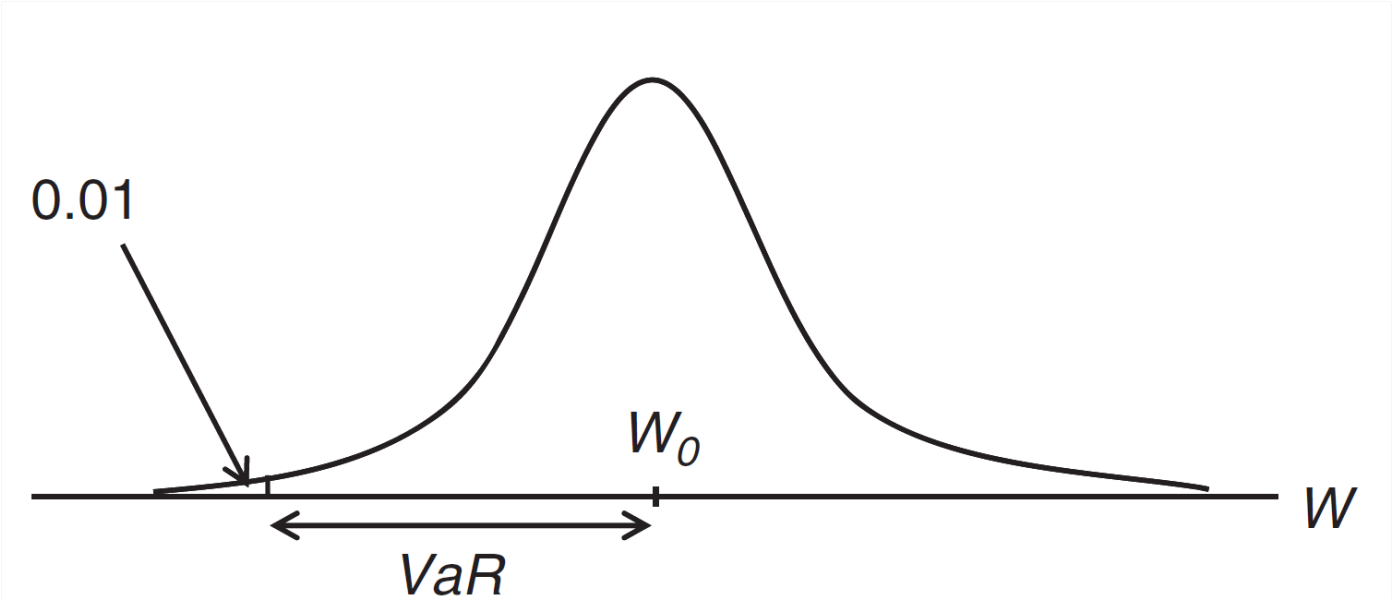

- Typical trading portfolio has its largest risk exposures to:
  - interest rates
  - equities
  - foreign exchange
  - commodities
- VaR: self-reported portfolio value-at-risk
  - level of asset holdings
  - asset volatilities
  - correlation structure
  - relevant historical data period

VaR Exceptions & Capital Charge

$$Capital\ charge = k \times VaR$$

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k:

- Regulatory capital multiplier based on past year's Exceptions.

VaR Exceptions:

- Compare reported VaR to trading book gains/losses each day.

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VaR Exceptions:

- Compare reported VaR to trading book gains/losses each day.

Exceptions	k factor	Regulatory Zone
0-4	3.00	Green
5	3.40	Yellow
6	3.50	
7	3.65	
8	3.75	
9	3.85	
10+	4.00	Red

Data:

- 15 large global banks, 2002-2012 (quarterly)

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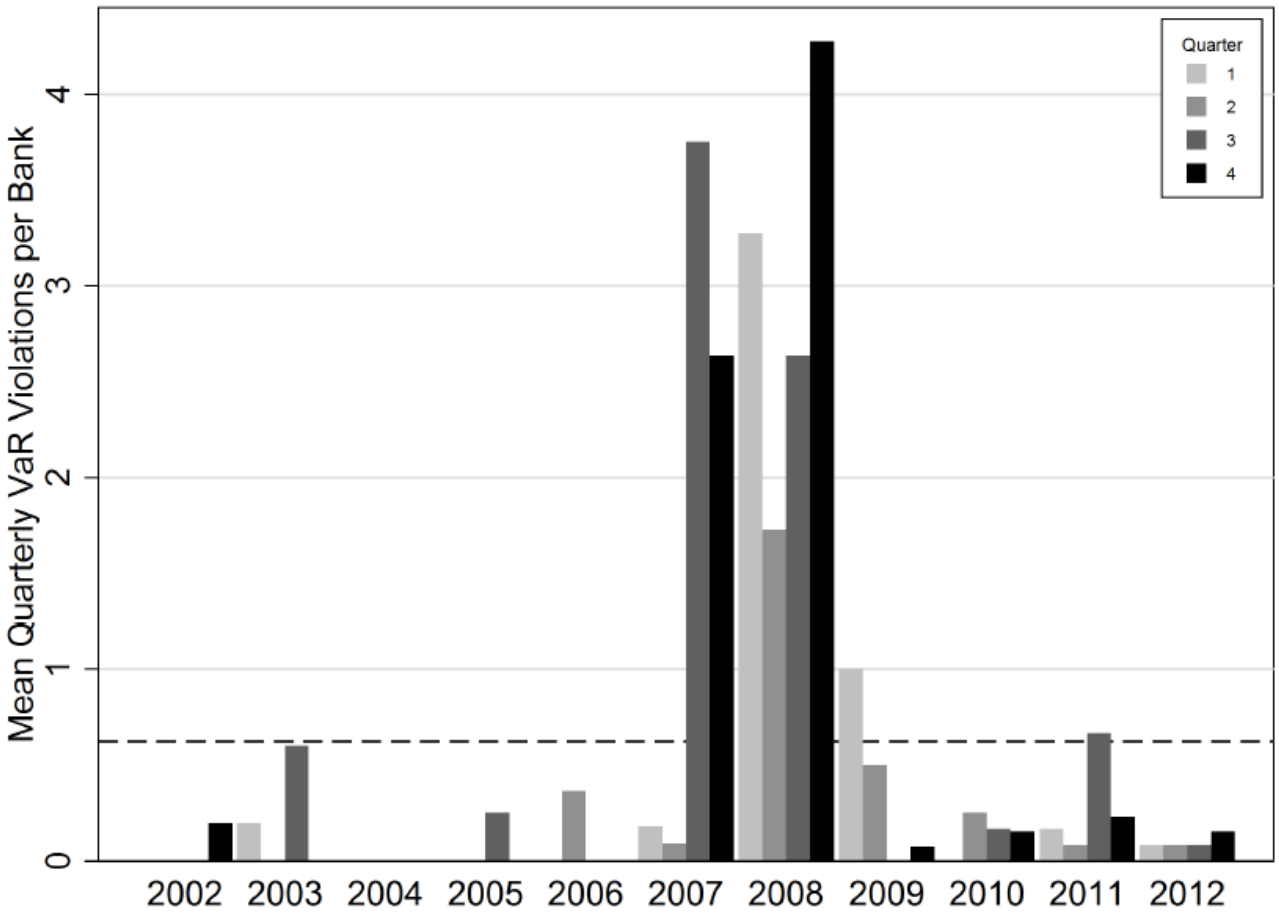

Research Design

Framework for setting up empirical tests:

$$
\begin{aligned}
Reported_{it} &= G(\alpha, \Lambda_{it}, \Sigma_{predicted}) - \eta_{it} \\
\eta_{it} &= \phi(Incentives_{it}) + u_{it} \\
Actual_{it} &= G(\alpha, \Lambda_{it}, \Sigma_{realized})
\end{aligned}
$$

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$$\begin{aligned} Actual_{it} - Reported_{it} = \quad & \{G(\alpha, \Lambda_{it}, \Sigma_{realized}) - G(\alpha, \Lambda_{it}, \Sigma_{predicted})\} \\ & + \phi(Incentives_{it}) + u_{it} \end{aligned}$$

Research Design

Framework for setting up empirical tests:

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\begin{aligned}
Reported_{it} &= G(\alpha, \Lambda_{it}, \Sigma_{predicted}) - \eta_{it} \\
\eta_{it} &= \phi(Incentives_{it}) + u_{it} \\
Actual_{it} &= G(\alpha, \Lambda_{it}, \Sigma_{realized})
\end{aligned}
$$

$$
\overbrace{Actual_{it} - Reported_{it}}^{Exceptions_{i,t+1}} = \overbrace{\{G(\alpha, \Lambda_{it}, \Sigma_{realized}) - G(\alpha, \Lambda_{it}, \Sigma_{predicted})\}}^{ModelQuality_{it}}
$$

$$
+\underbrace{\phi(Incentives_{it})}_{Equity_{it}} + u_{it}
$$

VaR Exceptions and Book Equity

Do banks under-report their risk when their capital levels are low?

- Key incentive variable: $Equity_{it} = \log\left(\frac{Equity}{Assets}\right)$

$$Exceptions_{i,t+1} = \psi(Equity)_{it} + \alpha_i + \zeta_t + \Gamma X_{it} + \epsilon_{it}$$

Prediction: Low Equity *today*$\Rightarrow$ higher *future* exceptions.

- $\hat{\psi} < 0$

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Prediction: Low Equity *today* $\Rightarrow$ higher *future* exceptions.

- $\hat{\psi} < 0$

Note:

- The dependent variable is **Exceptions**, not VaR.

VaR Exceptions and Book Equity

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions	(4) (z)Exceptions	(5) (z)Exceptions
(z)log(Eq/A)	-0.70***				
	(0.01)				
(z)log(Assets)					
(z)NI-to-Assets					
(z)Vol-Commodities					
(z)Vol-S&P 500					
(z)Vol-Foreign Exchange					
(z)Vol-Interest Rate					
Bank FE	Yes				
Year-Quarter FE	Yes				
Observations	424				
R^2	0.45				
Clustered by	Y-Q				

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

VaR Exceptions and Book Equity

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions	(4) (z)Exceptions	(5) (z)Exceptions
(z)log(Eq/A)	-0.70***	-0.63***			
	(0.01)	(0.00)			
(z)log(Assets)		0.51			
		(0.16)			
(z)NI-to-Assets		-0.03			
		(0.74)			
(z)Vol-Commodities					
(z)Vol-S&P 500					
(z)Vol-Foreign Exchange					
(z)Vol-Interest Rate					
Bank FE	Yes	Yes			
Year-Quarter FE	Yes	Yes			
Observations	424	424			
R^2	0.45	0.45			
Clustered by	Y-Q	Y-Q			

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(z)log(Eq/A)	-0.70***	-0.63***	-0.78***		
	(0.01)	(0.00)	(0.00)		
(z)log(Assets)		0.51	0.35**		
		(0.16)	(0.02)		
(z)NI-to-Assets		-0.03	-0.02		
		(0.74)	(0.81)		
(z)Vol-Commodities			0.11**		
			(0.03)		
(z)Vol-S&P 500			0.31***		
			(0.00)		
(z)Vol-Foreign Exchange			0.01		
			(0.85)		
(z)Vol-Interest Rate			0.13**		
			(0.02)		
Bank FE	Yes	Yes	Yes		
Year-Quarter FE	Yes	Yes	No		
Observations	424	424	424		
R^2	0.45	0.45	0.41		
Clustered by	Y-Q	Y-Q	Y-Q		

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VaR Exceptions and Book Equity

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(z)log(Eq/A)	-0.70***	-0.63***	-0.78***	-0.66***	-0.66**
	(0.01)	(0.00)	(0.00)	(0.00)	(0.03)
(z)log(Assets)		0.51	0.35**	0.51	0.51**
		(0.16)	(0.02)	(0.14)	(0.04)
(z)NI-to-Assets		-0.03	-0.02	-0.04	-0.04
		(0.74)	(0.81)	(0.57)	(0.65)
(z)Vol-Commodities			0.11**	0.07	0.07
			(0.03)	(0.45)	(0.11)
(z)Vol-S&P 500			0.31***	0.37**	0.37**
			(0.00)	(0.02)	(0.03)
(z)Vol-Foreign Exchange			0.01	0.07	0.07
			(0.85)	(0.42)	(0.23)
(z)Vol-Interest Rate			0.13**	0.07	0.07
			(0.02)	(0.70)	(0.38)
Bank FE	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	No	Yes	Yes
Observations	424	424	424	424	424
R^2	0.45	0.45	0.41	0.47	0.47
Clustered by	Y-Q	Y-Q	Y-Q	Y-Q	Bank

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Addressing Model Quality Concerns

1. Macro shocks cause models to perform poorly:

2. Banks have time-invariant modeling skills that affect model performance:

3. Time-varying model quality that is correlated with equity capital.

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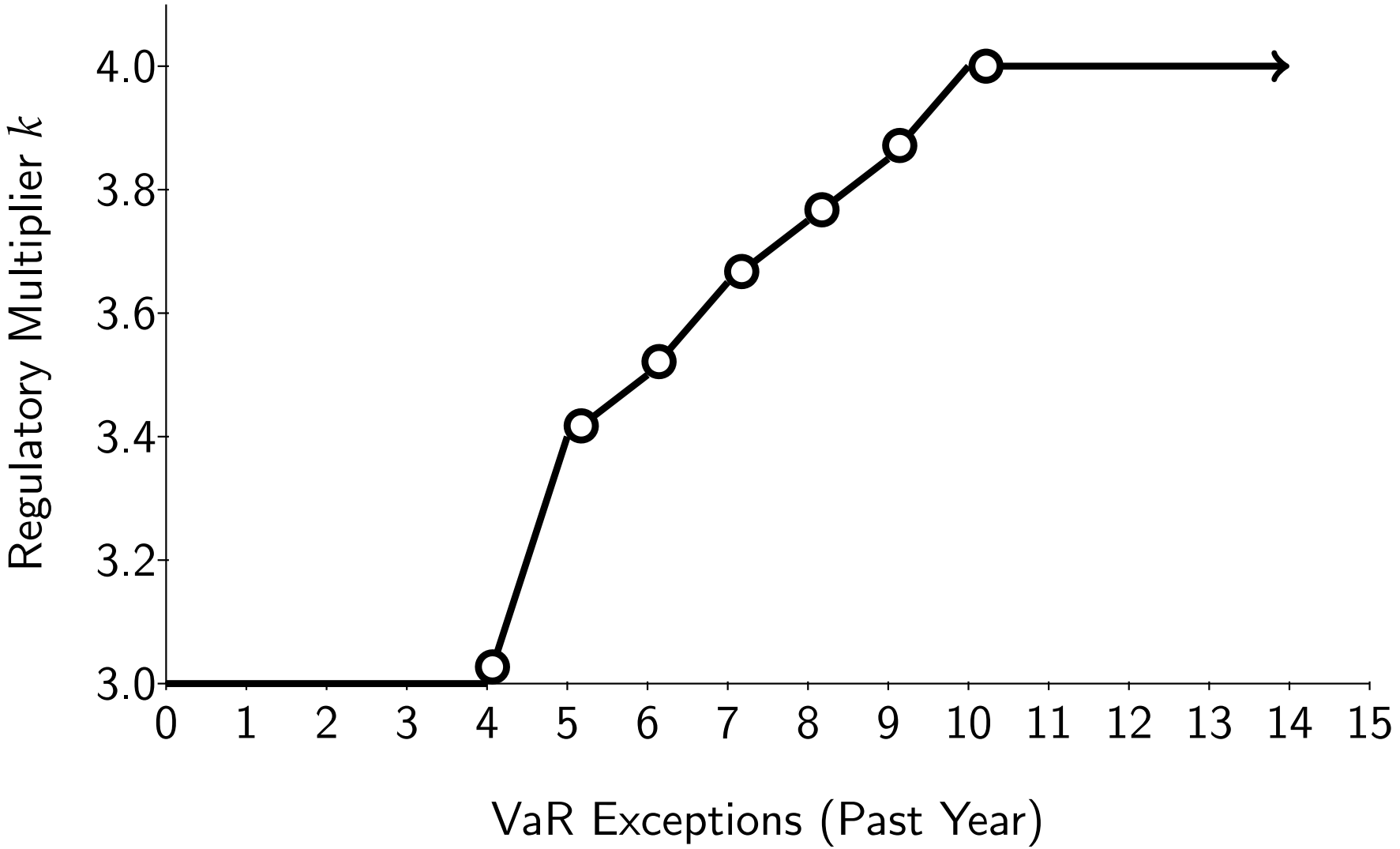
$$Exceptions_{i,t+1} = \beta(Equity)_{it} + \alpha_i + \delta_t + \Gamma X_{it} + \epsilon_{it}$$

where

$$\begin{aligned} \epsilon_{it} &= ModelQuality_{it} + \eta_{it} \\ cov(Equity_{it}, \epsilon_{it}) &= cov(Equity_{it}, ModelQuality_{it}) \neq 0 \end{aligned}$$

Regulatory Scrutiny, and the Shape of Penalties



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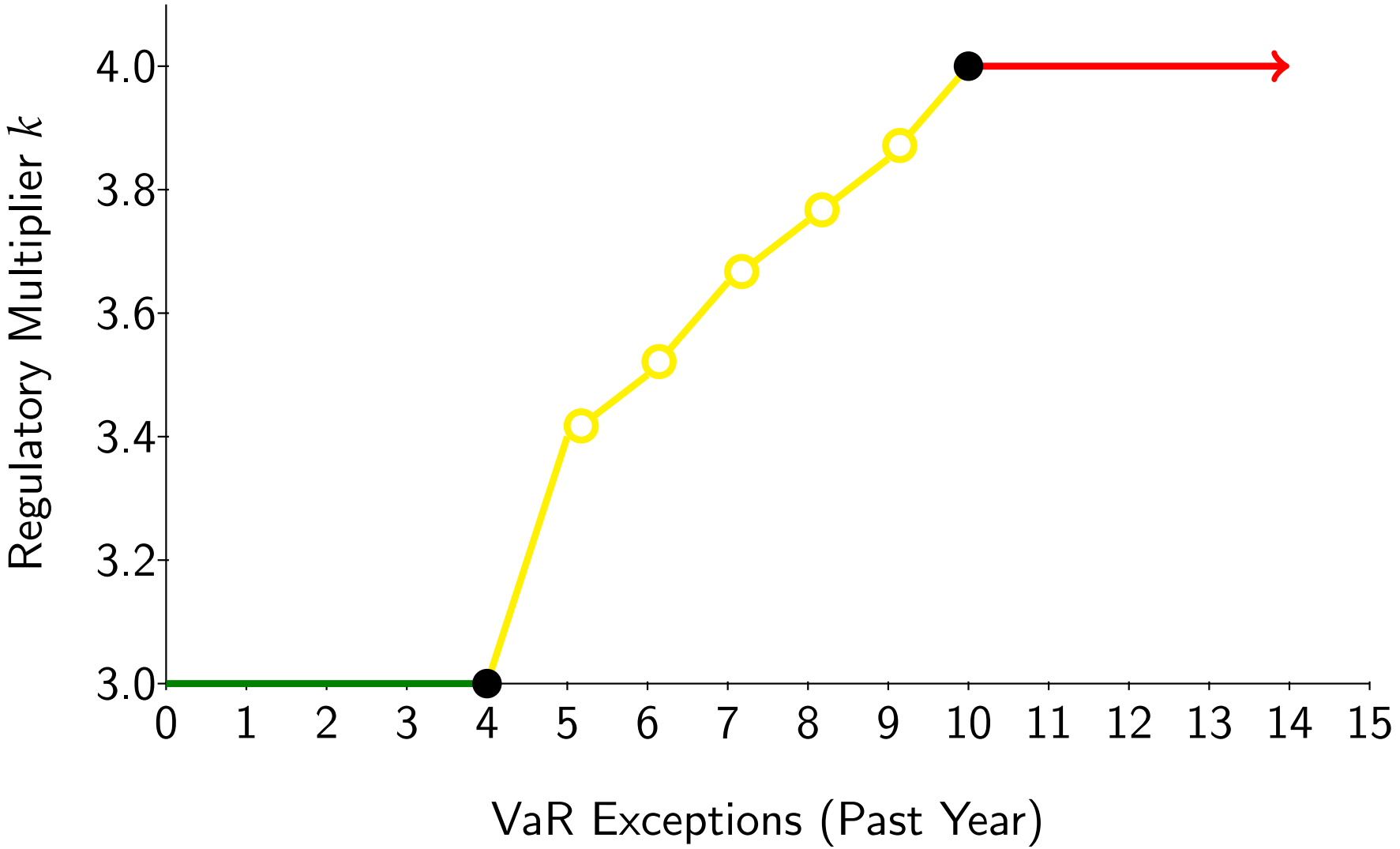

The Penalty Function and Reporting Incentives

- More than 4 exceptions in a year puts you in the yellow zone
- 99%-level VaR model means expectation of 0.62 exceptions/quarter.
- $\mathbb{E}[Exceptions_{4Q}] = Exceptions_{Trailing\ 3Q} + 0.62$

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- Expected-Green group: < 4 exceptions in the trailing 3 quarters.
- Expected-Yellow group ≥ 4 exceptions in the trailing 3 quarters.

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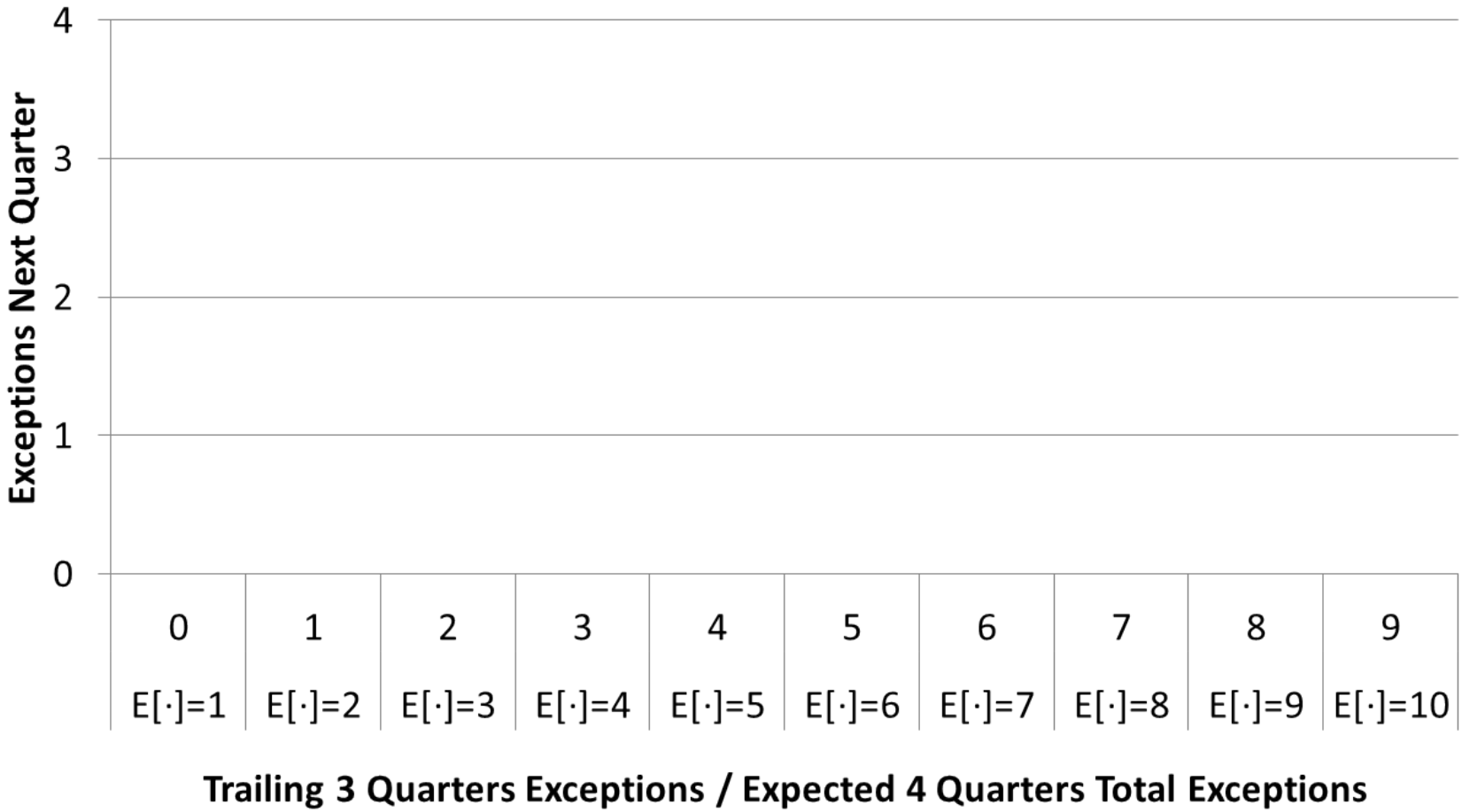
- Expected-Green group: < 4 exceptions in the trailing 3 quarters.
- Expected-Yellow group ≥ 4 exceptions in the trailing 3 quarters.

- Key idea: Banks near the Green-Yellow threshold have
  - similar recent model performance, but
  - *Yellow* banks have stronger incentives to under-report than *Green* banks at the margin.

Average Future Exceptions Around the Threshold



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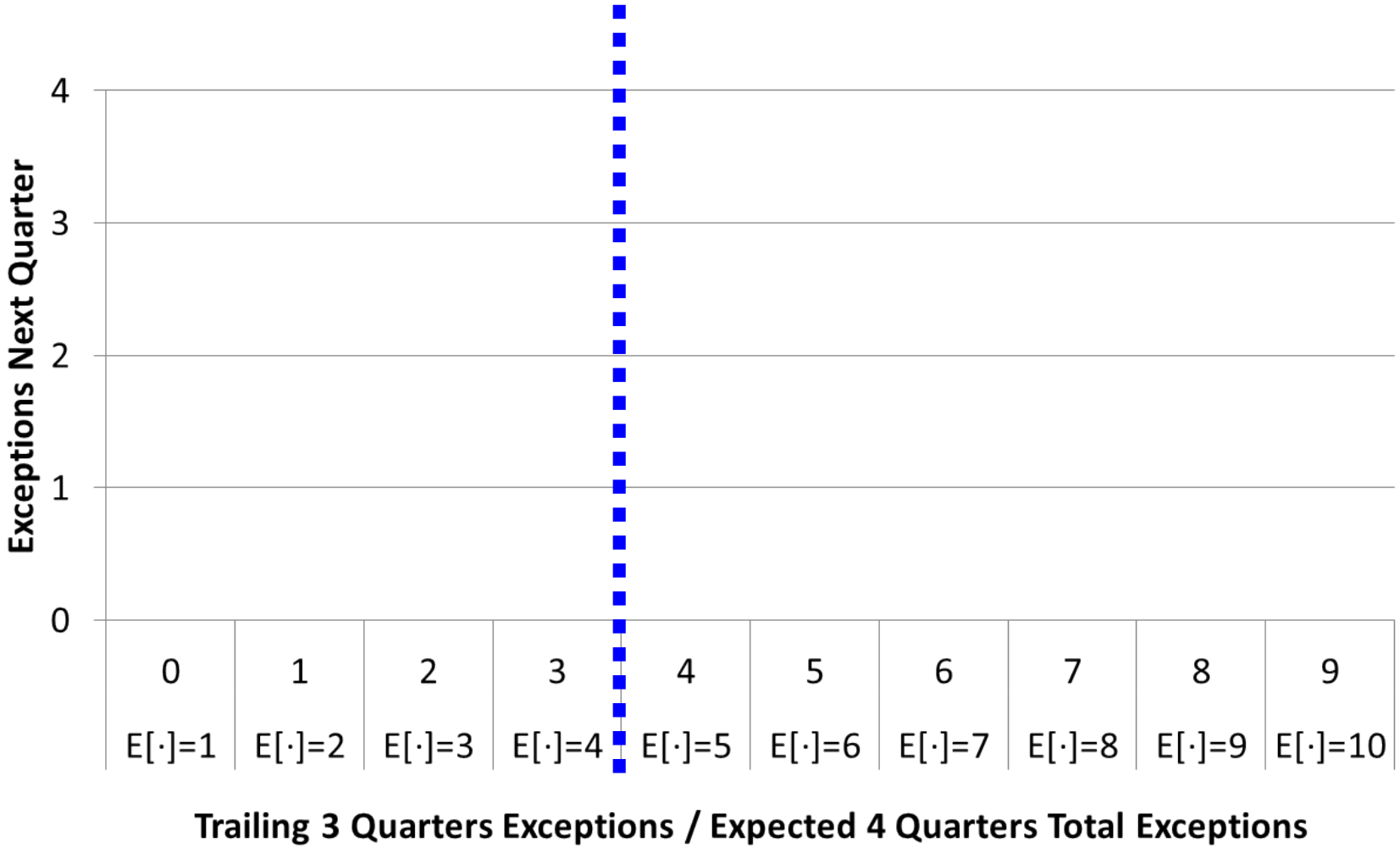

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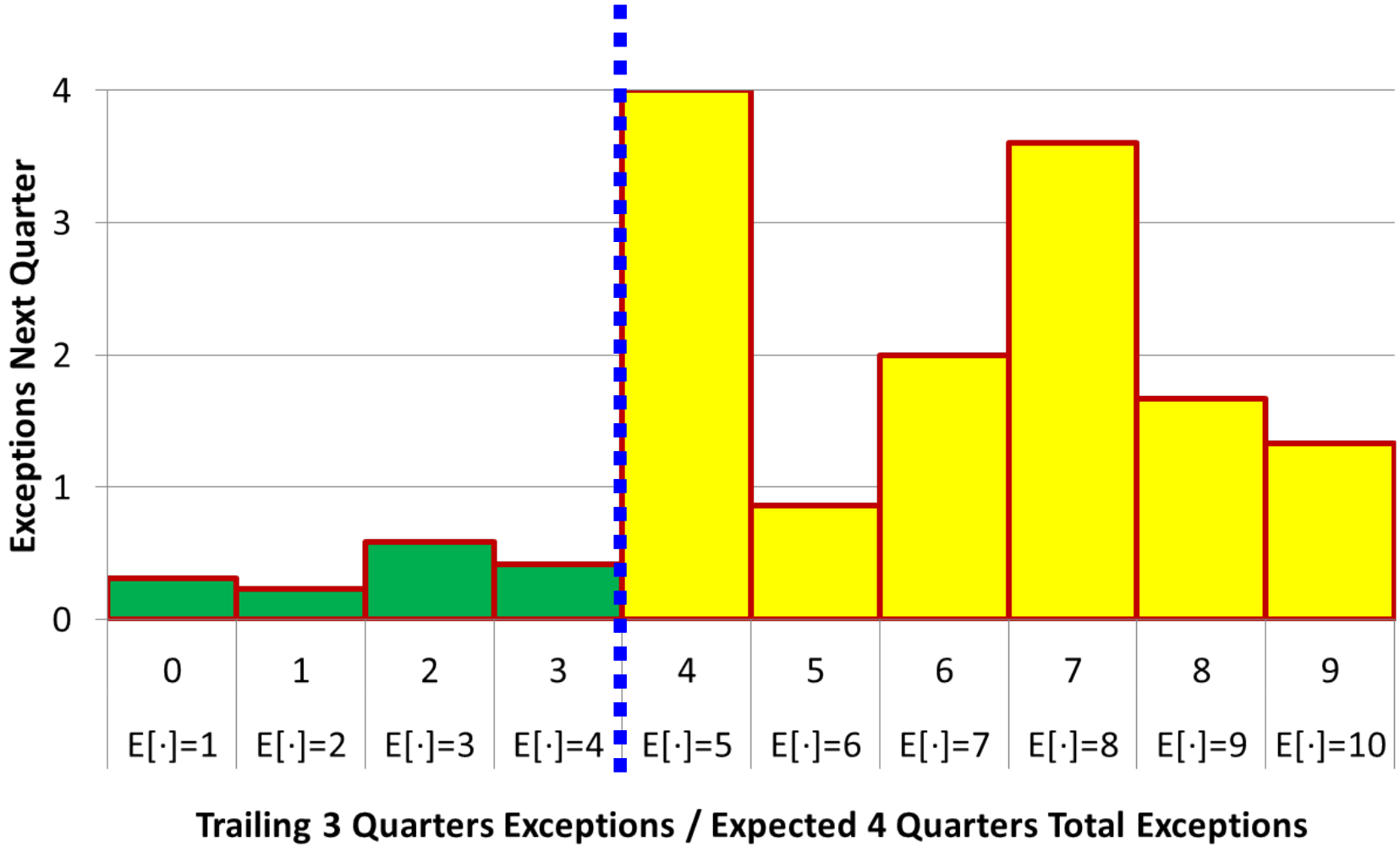

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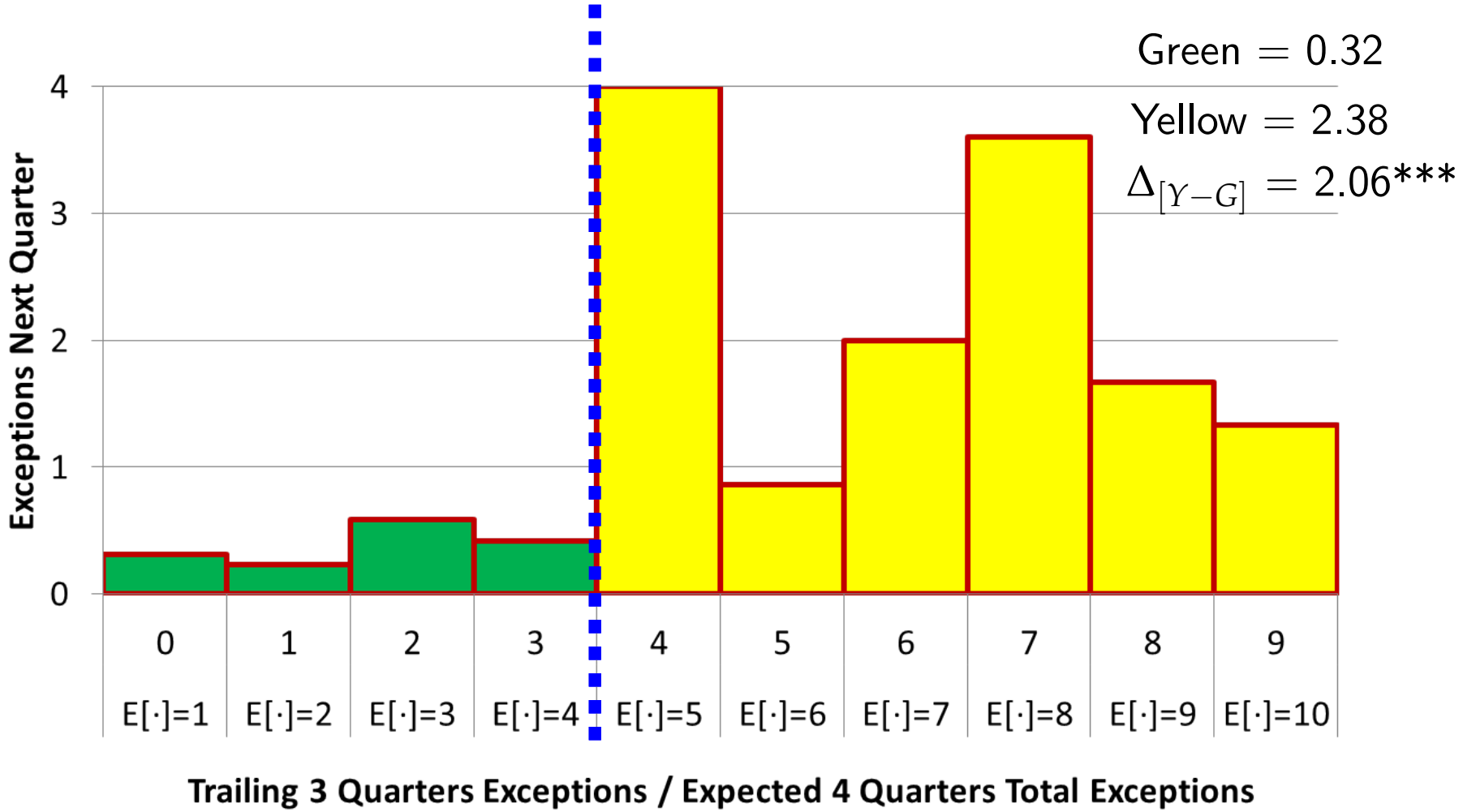

The Penalty Function and Equity Capital

$$\begin{aligned} Exceptions_{i,t+1} = \beta_0 + \beta_1(NegativeEquity_{i,t}) + \beta_2(Yellow_{i,t}) \\ + \beta_3(NegativeEquity_{i,t} \times Yellow_{i,t}) + \Gamma X_{i,t} + \epsilon_{i,t} \end{aligned}$$

Identifying Assumptions for observations near the Green-Yellow Threshold:

- correlation between unobserved model quality and equity capital is similar.
- there are sharp changes in incentives due to changes in net benefits of under-reporting.

VaR Exceptions, The Penalty Function, and Low Equity

	(1) Full	(2) Full	(3) Full	(4) [0-8]	(5) [1-8]	(6) [2-7]
(z)NegativeEquity	0.75***					
	(0.00)					
Yellow						
(z)NegativeEquity * Yellow						
Red						
(z)NegativeEquity * Red						
Controls	Yes					
Bank FE	Yes					
Year-Quarter FE	Yes					
Observations	378					
R^2	0.50					

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

VaR Exceptions, The Penalty Function, and Low Equity

	(1) Full	(2) Full	(3) Full	(4) [0-8]	(5) [1-8]	(6) [2-7]
(z)NegativeEquity	0.75***	0.59**				
	(0.00)	(0.02)				
Yellow		0.54**				
		(0.02)				
(z)NegativeEquity * Yellow						
Red		0.83				
		(0.25)				
(z)NegativeEquity * Red						
Controls	Yes	Yes				
Bank FE	Yes	Yes				
Year-Quarter FE	Yes	Yes				
Observations	378	378				
R^2	0.50	0.52				

p-values in parentheses
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VaR Exceptions, The Penalty Function, and Low Equity

	(1) Full	(2) Full	(3) Full	(4) [0-8]	(5) [1-8]	(6) [2-7]
(z)NegativeEquity	0.75***	0.59**	0.40*			
	(0.00)	(0.02)	(0.09)			
Yellow		0.54**	0.45*			
		(0.02)	(0.08)			
(z)NegativeEquity * Yellow			0.79*			
			(0.06)			
Red		0.83	0.54			
		(0.25)	(0.34)			
(z)NegativeEquity * Red			0.37			
			(0.24)			
Controls	Yes	Yes	Yes			
Bank FE	Yes	Yes	Yes			
Year-Quarter FE	Yes	Yes	Yes			
Observations	378	378	378			
R^2	0.50	0.52	0.55			

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(z)NegativeEquity	0.75***	0.59**	0.40*	0.26		
	(0.00)	(0.02)	(0.09)	(0.20)		
Yellow		0.54**	0.45*	0.54**		
		(0.02)	(0.08)	(0.03)		
(z)NegativeEquity * Yellow			0.79*	0.78*		
			(0.06)	(0.06)		
Red		0.83	0.54			
		(0.25)	(0.34)			
(z)NegativeEquity * Red			0.37			
			(0.24)			
Controls	Yes	Yes	Yes	Yes		
Bank FE	Yes	Yes	Yes	Yes		
Year-Quarter FE	Yes	Yes	Yes	Yes		
Observations	378	378	378	349		
R^2	0.50	0.52	0.55	0.58		

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

VaR Exceptions, The Penalty Function, and Low Equity

	(1) Full	(2) Full	(3) Full	(4) [0-8]	(5) [1-8]	(6) [2-7]
(z)NegativeEquity	0.75***	0.59**	0.40*	0.26	-0.08	
	(0.00)	(0.02)	(0.09)	(0.20)	(0.83)	
Yellow		0.54**	0.45*	0.54**	0.61*	
		(0.02)	(0.08)	(0.03)	(0.05)	
(z)NegativeEquity * Yellow			0.79*	0.78*	1.47***	
			(0.06)	(0.06)	(0.00)	
Red		0.83	0.54			
		(0.25)	(0.34)			
(z)NegativeEquity * Red			0.37			
			(0.24)			
Controls	Yes	Yes	Yes	Yes	Yes	
Bank FE	Yes	Yes	Yes	Yes	Yes	
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	
Observations	378	378	378	349	119	
R^2	0.50	0.52	0.55	0.58	0.77	

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

VaR Exceptions, The Penalty Function, and Low Equity

	(1) Full	(2) Full	(3) Full	(4) [0-8]	(5) [1-8]	(6) [2-7]
(z)NegativeEquity	0.75***	0.59**	0.40*	0.26	-0.08	1.68
	(0.00)	(0.02)	(0.09)	(0.20)	(0.83)	(0.13)
Yellow		0.54**	0.45*	0.54**	0.61*	1.01
		(0.02)	(0.08)	(0.03)	(0.05)	(0.38)
(z)NegativeEquity * Yellow			0.79*	0.78*	1.47***	1.54**
			(0.06)	(0.06)	(0.00)	(0.04)
Red		0.83	0.54			
		(0.25)	(0.34)			
(z)NegativeEquity * Red			0.37			
			(0.24)			
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	378	378	378	349	119	64
R^2	0.50	0.52	0.55	0.58	0.77	0.85

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Stale Model Unrelated to Incentives

- Banks were just too slow to update their model.
- Failure to update the model is unrelated to incentives.

Two Additional Tests:

1. leave out the transition period
2. exploit the dynamics of exceptions

Stale Model Unrelated to Incentives

- Banks were just too slow to update their model.
- Failure to update the model is unrelated to incentives.

Two Additional Tests:

1. leave out the transition period
2. exploit the dynamics of exceptions
   - Use lagged exception as a proxy for time-varying modeling skill:

$$Exceptions_{i,t+1} = \beta(Equity)_{it} + \alpha_i + \delta_t + \Gamma X_{it} + \theta Exceptions_{i,t} + \eta_{it}$$

Stale Model Tests

Stale Model Tests

	(1) All	(2) drop2007	(3) AB1lag	(4) AB2lags
(z)log(Eq/A)	-0.66***			
	(0.00)			
L.(z)Exceptions				
L2.(z)Exceptions				
Controls	Yes			
Bank FE	Yes			
Year-Quarter FE	Yes			
Observations	424			
R^2	0.47			
2nd Order AR test p-value				
Sargan Test p-value				

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Stale Model Tests

	(1) All	(2) drop2007	(3) AB1lag	(4) AB2lags
(z)log(Eq/A)	-0.66***	-0.65**		
	(0.00)	(0.01)		
L.(z)Exceptions				
L2.(z)Exceptions				
Controls	Yes	Yes		
Bank FE	Yes	Yes		
Year-Quarter FE	Yes	Yes		
Observations	424	379		
R^2	0.47	0.48		
2nd Order AR test p-value				
Sargan Test p-value				

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Stale Model Tests

	(1) All	(2) drop2007	(3) AB1lag	(4) AB2lags
(z)log(Eq/A)	-0.66***	-0.65**	-0.45**	
	(0.00)	(0.01)	(0.01)	
L.(z)Exceptions			0.30***	
			(0.00)	
L2.(z)Exceptions				
Controls	Yes	Yes	Yes	
Bank FE	Yes	Yes	Yes	
Year-Quarter FE	Yes	Yes	Yes	
Observations	424	379	392	
R^2	0.47	0.48		
2nd Order AR test p-value			0.94	
Sargan Test p-value			0.49	

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Stale Model Tests

	(1) All	(2) drop2007	(3) AB1lag	(4) AB2lags
(z)log(Eq/A)	-0.66***	-0.65**	-0.45**	-0.47**
	(0.00)	(0.01)	(0.01)	(0.02)
L.(z)Exceptions			0.30***	0.31***
			(0.00)	(0.00)
L2.(z)Exceptions				-0.01
				(0.96)
Controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Observations	424	379	392	378
R^2	0.47	0.48		
2nd Order AR test p-value			0.94	1.00
Sargan Test p-value			0.49	0.52

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Variation in the Benefits of Under-Reporting

Cross-Sectional Variation:

- Banks with large trading operations.

Time Series Variation:

- Times when the financial system is under stress.

VaR Exceptions and Trading Exposure

Key idea: Under-reporting provides more capital relief to banks with relatively larger trading desks.

VaR Exceptions and Trading Exposure

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Measure: VaR-to-equity-capital ratio as of 2006Q1 (VE_2006).

- Captures the relative importance of VaR levels to capital charges.
- Freezing the measure at 2006Q1 ensures it is not affected by post-crisis changes in risk-taking behavior or equity capital.

$$Exceptions_{i,t+1} = \psi(Equity)_{it} + \theta(Equity_{it} \times VE\_2006_i) + \Gamma X_{it} + \epsilon_{it}$$

Prediction: Larger Trading Exposure $\Rightarrow$ higher sensitivity to low capital.

- $\hat{\theta} < 0$

VaR Exceptions and Trading Exposure

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions
(z)log(Eq/A)	-0.92**		
	(0.01)		
(z)VE_2006 * (z)log(Eq/A)			
High(VE_2006) * (z)log(Eq/A)			
Controls	Yes		
Bank FE	Yes		
Year-Quarter FE	Yes		
Observations	330		
R^2	0.47		

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

VaR Exceptions and Trading Exposure

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions
(z)log(Eq/A)	-0.92**	-0.50	
	(0.01)	(0.15)	
(z)VE_2006 * (z)log(Eq/A)		-0.48**	
		(0.02)	
High(VE_2006) * (z)log(Eq/A)			
Controls	Yes	Yes	
Bank FE	Yes	Yes	
Year-Quarter FE	Yes	Yes	
Observations	330	330	
R^2	0.47	0.50	

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

VaR Exceptions and Trading Exposure

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions
(z)log(Eq/A)	-0.92**	-0.50	0.35
	(0.01)	(0.15)	(0.45)
(z)VE_2006 * (z)log(Eq/A)		-0.48**	
		(0.02)	
High(VE_2006) * (z)log(Eq/A)			-1.92**
			(0.02)
Controls	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes
Observations	330	330	330
R^2	0.47	0.50	0.51

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Risk Reporting During System-Wide Stress

During times of financial sector stress:

- capital is likely most costly
- it is most important for regulators to get an accurate measurement of risk

$\Rightarrow$ Both private benefits and social costs of under-reporting are high.

Risk Reporting During System-Wide Stress

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$\Rightarrow$ Both private benefits and social costs of under-reporting are high.

We focus on two main proxies of system-wide stress:

1. Lehman Brothers' collapse (2008Q4)
2. V-lab Capital Shortfall measure (Acharya et al. 2010)

$$\begin{aligned} Exceptions_{i,t+1} =& \psi(Equity)_{it} + \rho(Stress)_t \\ &+ \phi(Equity_{it} * Stress_t) + \Gamma X_{it} + \epsilon_{it} \end{aligned}$$

Risk Reporting During System-Wide Stress

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions	(4) (z)Exceptions
(z)log(Eq/A)	-0.66***			
	(0.00)			
(z)log(Eq/A) * 2008q4				
HiMES (top 4-tile)				
(z)log(Eq/A) * HiMES				
Controls	Yes			
Bank FE	Yes			
Year-Quarter FE	Yes			
Observations	424			
R^2	0.47			

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Risk Reporting During System-Wide Stress

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions	(4) (z)Exceptions
(z)log(Eq/A)	-0.66***	-0.57**		
	(0.00)	(0.01)		
(z)log(Eq/A) * 2008q4		-1.75***		
		(0.00)		
HiMES (top 4-tile)				
(z)log(Eq/A) * HiMES				
Controls	Yes	Yes		
Bank FE	Yes	Yes		
Year-Quarter FE	Yes	Yes		
Observations	424	424		
R^2	0.47	0.56		

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Risk Reporting During System-Wide Stress

	(1) (z)Exceptions	(2) (z)Exceptions	(3) (z)Exceptions	(4) (z)Exceptions
(z)log(Eq/A)	-0.66***	-0.57**	-0.66***	-0.26
	(0.00)	(0.01)	(0.01)	(0.18)
(z)log(Eq/A) * 2008q4		-1.75***		
		(0.00)		
HiMES (top 4-tile)			0.22	0.21
			(0.56)	(0.57)
(z)log(Eq/A) * HiMES				-0.42**
				(0.04)
Controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Observations	424	424	424	424
R^2	0.47	0.56	0.48	0.51

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Additional Robustness Tests:

1. Alternative measures of capital.
2. Poisson/negative binomial specifications.
3. Alternative measure of "excess" exceptions.
4. Control for
   - time-varying market risk exposure.
   - time-varying MBS exposure.
   - time-varying VaR risk factor exposure.

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The Level of VaR and Equity Capital:

- Prior volatility directly maps to the level of VaR.
- We find the a weaker relationship between past market volatility and reported level of VaR when firms have lower equity capital.
  - Suggests firms are using more discretion in the VaR reports when undercapitalized.

Summary

- Proper risk measurement is critical for the stability of individual financial institution and the financial system at large.
  - Important for within-firm capital allocation decisions and risk management.
  - Important for regulators to ensure a stable, functioning financial sector.

- The system provides managers with the incentives and ability to under-report risk to save capital when raising capital is more costly.

$\Rightarrow$ The states of the world when accurate risk measurement may be most important are precisely when this measurement is least informative.

The Strategic Under-Reporting of Bank Risk

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Descriptive Statistics

	Mean	SD	Min	P25	Median	P75	Max	N
Bank Characteristics:								
Total Assets ($Bn)	901.40	767.93	73.14	291.14	602.46	1428.16	3643.58	424
NI-to-Assets (%,Q)	0.17	0.20	-1.16	0.09	0.18	0.25	1.57	424
BookEq/AT (%)	6.32	3.15	1.69	4.06	5.14	9.01	13.84	424
log(Eq/AT)	-2.89	0.51	-4.08	-3.20	-2.97	-2.41	-1.98	424
Value-at-Risk ($MM):								
Exceptions	0.62	2.00	0.00	0.00	0.00	0.00	13.00	424
Total Value-at-Risk	61.90	85.86	3.60	9.00	26.00	75.00	433.00	422
VaR-Interest Rate	46.42	73.39	0.00	4.40	15.28	60.80	430.58	422
VaR-Foreign Exchange	9.09	12.44	0.00	0.89	2.69	15.70	62.82	422
VaR-Equities	20.87	31.39	0.00	3.14	7.64	27.12	204.60	422
VaR-Commodities	7.49	10.80	0.00	0.29	2.08	10.50	52.31	422
VaR-Other	17.23	49.72	0.00	0.00	0.00	8.65	322.88	422
VaR-Diversification Benefit	40.89	54.01	0.00	4.86	11.70	59.60	241.67	422

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