Discussion: "Limited Arbitrage Between Equity and Credit Markets"

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Theme

The paper

The lack of integration between equity-credit markets reflects arbitrage opportunities, and more limits-to-arbitrage imply less integrated markets

Theme

Discussion

The equity-credit markets integration does not necessarily reflect arbitrage

Outline

Review

Table 4: Correlation between stock returns and changes in CDS spread

Interval	No. of Firms	Mean	Median	Max.	Min.	Std.
5	200	-0.12	-0.12	0.08	-0.42	0.08
10	200	-0.17	-0.16	0.16	-0.45	0.10
25	188	-0.25	-0.25	0.24	-0.64	0.16
50	139	-0.34	-0.33	0.13	-0.81	0.18

Tables 5–8: The magnitude of the correlations decreases with limits-to-arbitrage measures such as illiquidity, idiosyncratic risk, etc.

Review

Table 5: The effect of informational sensitivity (credit risk)

$$\text{tkcorr} = \alpha + \beta_1\,\text{foredisp} + \beta_2\,\text{eqvol} + \beta_3\,\text{lnmcap} + \beta_4\,\text{lev} + \beta_5\,\text{rating} + \epsilon$$

Interval	Firm#	Intercept	Foredisp	Eqvol	Lnmcap	Lev	Rating	Adj. R^2
5	187	0.0874	-2.5470	-0.0794	-0.0176	-0.0502	0.0263	17%
		(1.44)	(-3.65)**	(-1.94)*	(-2.92)**	(-1.38)	(1.73)*	
10	187	0.1103	-3.8526	-0.1369	-0.0225	-0.0394	0.0456	27%
		(1.54)	(-4.66)**	(-2.82)**	(-3.16)**	(-0.92)	(2.53)**	
25	178	0.1277	-6.6410	-0.2473	-0.0286	-0.0737	0.0734	29%
		(1.05)	(-4.56)**	(-2.93)**	(-2.37)**	(-1.00)	(2.38)**	
50	138	-0.1265	-2.9702	-0.5602	-0.0051	-0.1018	0.1092	35%
		(-0.71)	(-1.53)	(-4.46)**	(-0.30)	(-0.98)	(2.64)**	

Review

Table 6: The effect of liquidity (the proportion of zero daily spread changes)

$$\text{tkcorr} = \alpha + \beta_1 \text{ Zspread} + \beta_2 \text{ foredisp} + \beta_3 \text{ eqvol} + \beta_4 \text{ lnmcap} + \beta_5 \text{ rating} + \epsilon$$

Panel B: Zero Spread

Interval	# of Firms	Intercept	Zspread	Foredisp	Eqvol	Lnmcap	Rating	Adj. R^2
5	187	-0.0316	0.1858	-2.3111	-0.0766	-0.0113	0.0280	21%
		(-0.55)	(3.10)**	(-3.40)**	(–1.91)*	(-1.96)*	(1.92)*	
10	187	-0.0252	0.2450	-3.4157	-0.1331	-0.0156	0.0456	31%
		(-0.37)	(3.48)**	(-4.28)**	(-2.83)**	(-2.29)**	(2.65)**	
25	178	-0.0905	0.3619	-6.0825	-0.2459	-0.0168	0.07402	31%
		(-0.76)	(2.84)**	(-4.28)**	(-2.98)**	(-1.44)	(2.49)**	
50	138	-0.4853	0.6401	-1.7429	-0.5371	0.01229	0.1133	40%
		(-2.83)**	(3.21)**	(-0.92)	(-4.41)**	(0.77)	(2.92)**	

Review

Table 8: The effect of idiosyncratic risk

$$\text{tkcorr} = \alpha + \beta_1 \text{ Idiosyn} + \beta_2 \text{ foredisp} + \beta_3 \text{ eqvol} + \beta_4 \text{ lnmcap} + \beta_5 \text{ rating} + \epsilon$$

			Idiosyncratic Risk					
Interval	Firm#	Intercept	Idiosyn	Foredisp	Eqvol	Lnmcap	Rating	Adj. R^2
5	187	0.00	0.0256	-2.8957	-0.0656	-0.0153	0.0453	22%
		(0.00)	(3.47)**	(−4.40)**	(-1.64)	(−2.74)**	(3.00)**	
10	187	0.0317	0.0255	-4.1507	-0.1231	-0.0208	0.0637	29%
		(0.50)	(2.90)**	(−2.76)**	(−5.27)**	(−2.57)**	(3.53)**	
25	178	-0.0468	0.0693	-6.9807	-0.2388	-0.0252	0.1121	36%
		(-0.45)	(4.56)**	(-5.22)**	(-2.99)**	(-2.30)**	(3.79)**	
50	138	-0.2910	0.0614	-3.6282	-0.5378	-0.0026	0.1435	39%
		(-1.91)*	(2.96)**	(-1.98)**	(-4.40)	(-0.16)	(3.61)**	

Theory

The starting point

The null seems to be that, if arbitrage were perfect, the correlation between stock returns and the CDS-spread changes should be -100%

Empirical correlations from -12% to -34% are too low

Limits-to-arbitrage must be important!

Theory

What is the theoretical null from the Merton-style structural models?

Firm value follows a geometric Brownian motion

Equity E is a European call:

$$E = V\,N(d_1) - Ke^{-rT}N(d_2)$$

$$\text{in which} \qquad d_1 = \frac{\ln(V/K) + (r + \sigma_V^2/2)T}{\sigma_V\sqrt{T}}; \qquad d_2 = d_1 - \sigma_V\sqrt{T}$$

Debt and credit spread:

$$B = V - E \qquad \Rightarrow \qquad y = \frac{1}{T}\ln\left(\frac{K}{B}\right) - r$$

Theory

Simulation design

Parameter values: $r = 0.02$; $\mu_V = 0.06$; $\sigma_V = 0.10$; $T = 5$

5,000 simulations, each with 52×30 weeks (52×25 burn-in weeks)

Calibrate K to reflect different financial policies:

- Managerial passivity à la Welch (2004):

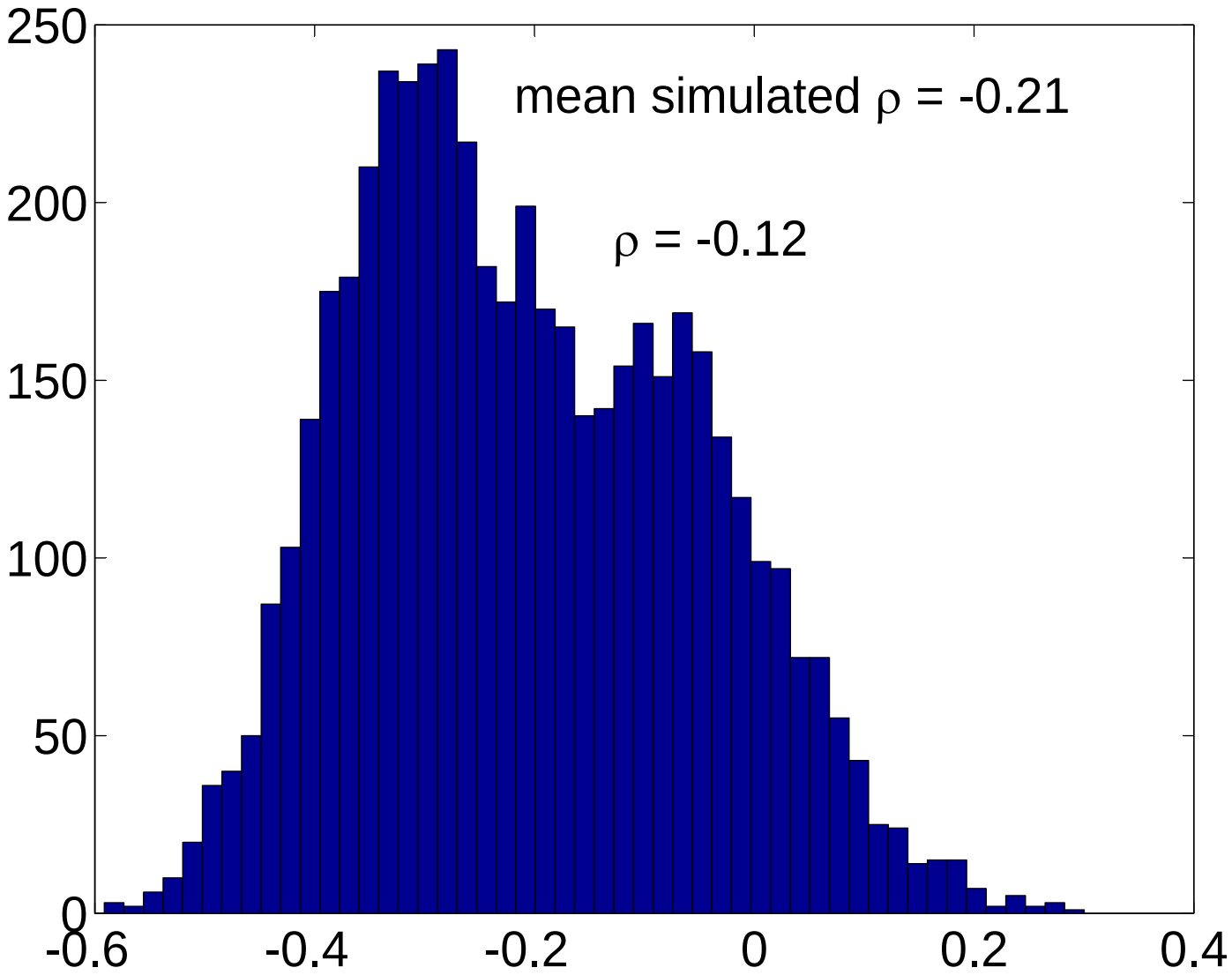
$$K = \tau \overline{V}, \qquad 0 < \tau < 1$$

- Smooth adjustment:

$$K_t = \tau V_t, \qquad 0 < \tau < 1$$

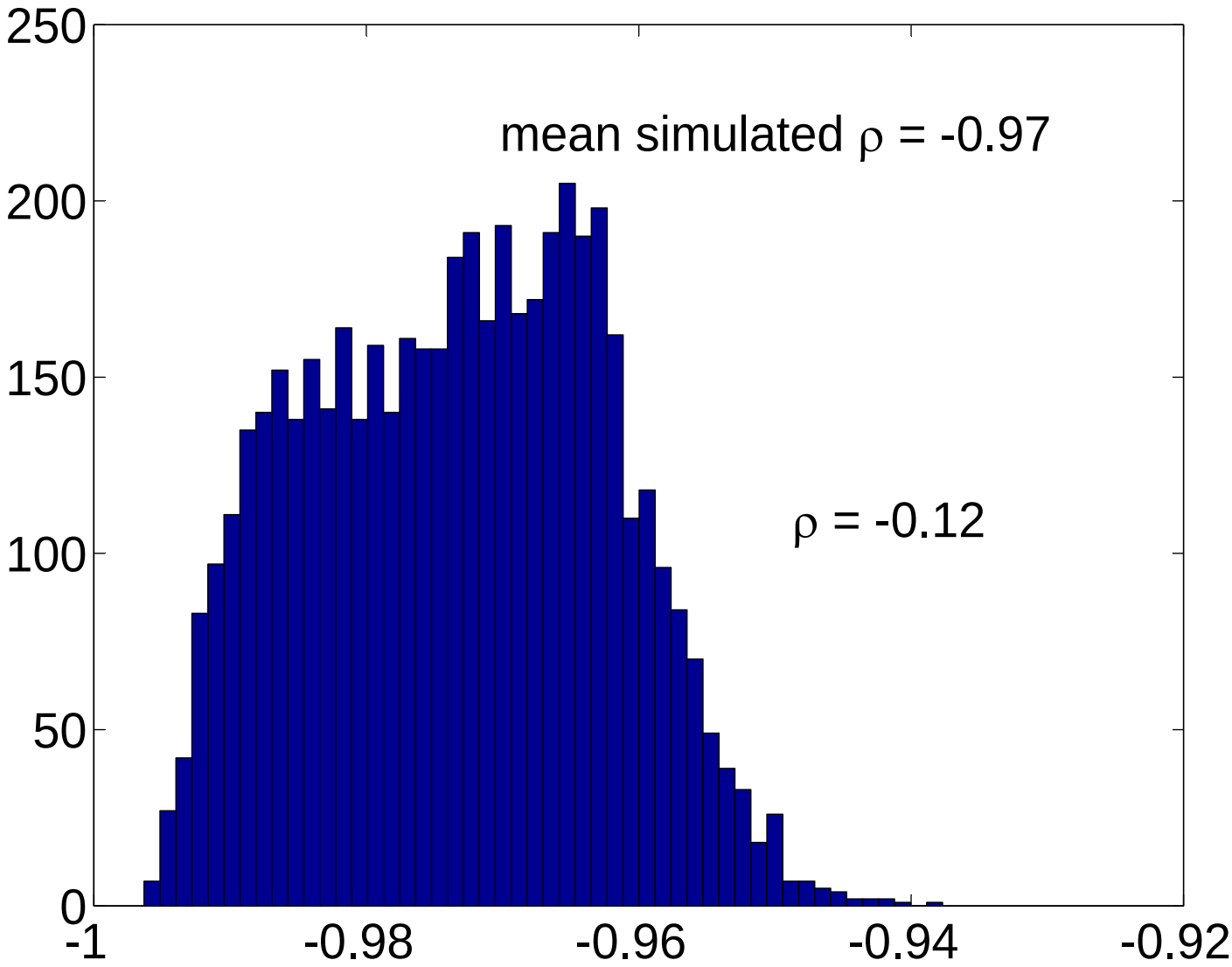
Theory

Is low integration a problem? ($\tau = 0.175$, passive capital structure policy)



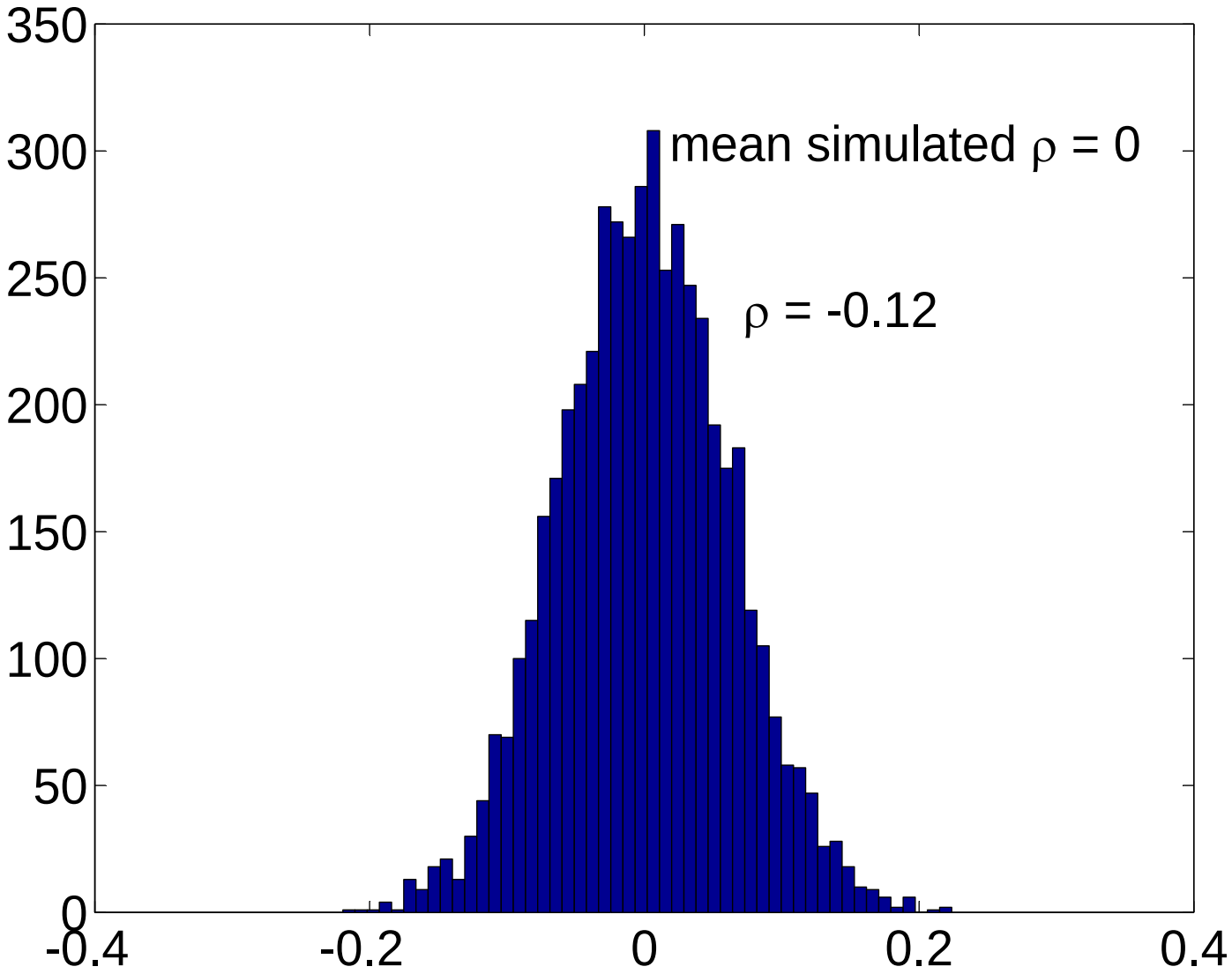
Theory

Link to the credit spread puzzle: ($\tau = 0.975$, passive capital structure policy)



Theory

The importance of capital structure policy: ($\tau = 0.975$, active capital structure policy)



Theory

The importance of capital structure policy: Intuition

A negative shock on V $\Rightarrow$ Stock returns $\downarrow$ $\Rightarrow$

$$\overbrace{K \text{ unchanged} \Rightarrow \text{Credit risk/spread} \uparrow \Rightarrow \text{high correlation}}^{\textbf{Passive capital structure policy}}$$

$$\underbrace{K \downarrow \Rightarrow \text{Credit risk/spread unchanged} \Rightarrow \text{low correlation}}_{\textbf{Active capital structure policy}}$$

Low equity-credit markets integration $\neq$ arbitrage opportunities

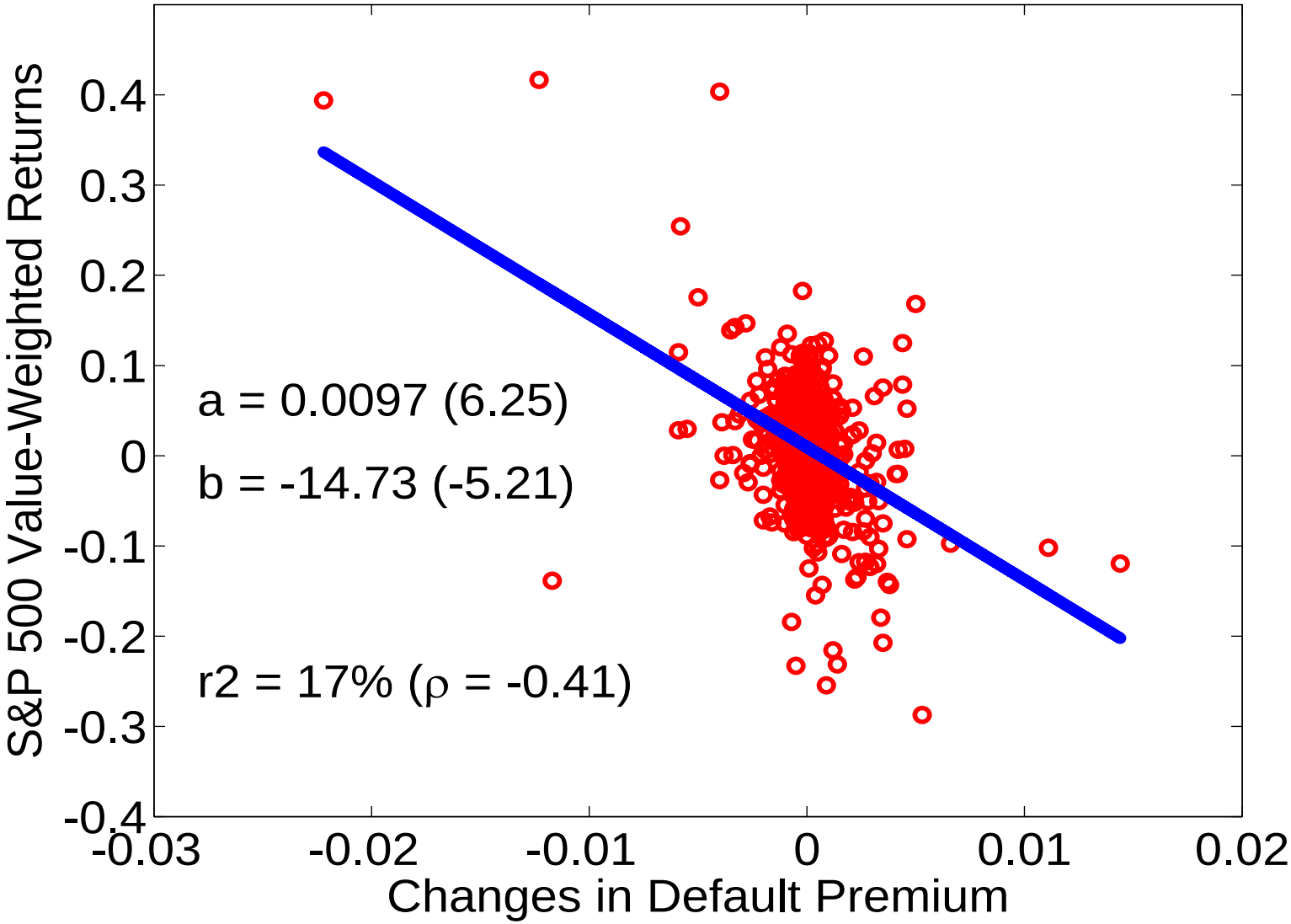
Empirics

Comments on empirical tests

1. CDS data for U.S. non-financials from January 2001 to December 2005: What about a longer sample from the Lehman Dataset?
2. The equity-credit markets integration is measured by the Kendall tau: What about more standard (Pearson and Spearman) correlations?
3. The effect of credit risk on the equity-credit markets integration: Analyst forecasts dispersion and leverage
4. Distinguish the effects of idiosyncratic volatility and total volatility
5. *Interpretation: Several limits-to-arbitrage proxies also appear in the Merton-style models (eqvol, idiosyn, credit risk)*
6. *Supplement firm-level cross-sectional analysis with aggregate-level time-series analysis*

Empirics

Time-series evidence: Monthly from January 1927 to December 2006



Conclusion

The publicly delivered version

Intriguing new evidence on the equity-credit markets integration with interpretation based on limits-to-arbitrage

I feel that the paper can be improved by:

- Specifying the theoretical null and quantifying empirical deviations
- Strengthening the empirical analysis such as the time-series tests

Conclusion

What I really meant...

What arbitrage!?

Conclusion

Implication

What limits-to-arbitrage!?