

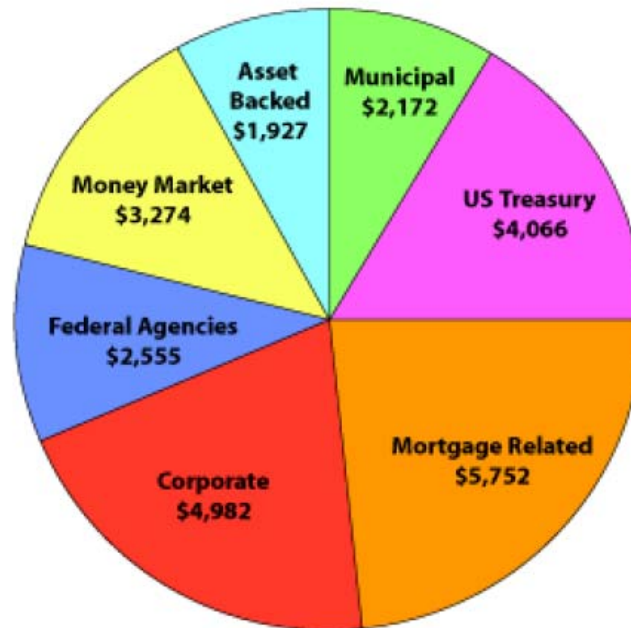
Some Initial Evidence on the Role of Accounting Earnings in the Bond Market

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- **Very limited empirical evidence on the role of accounting earnings in the bond market**
- **Most of the empirical research focused on the equity market (starting with Ball and Brown [1968] and Beaver [1968])**
- **The U.S. bond market is almost twice the size of the combined market capitalization of all U.S. stock markets**

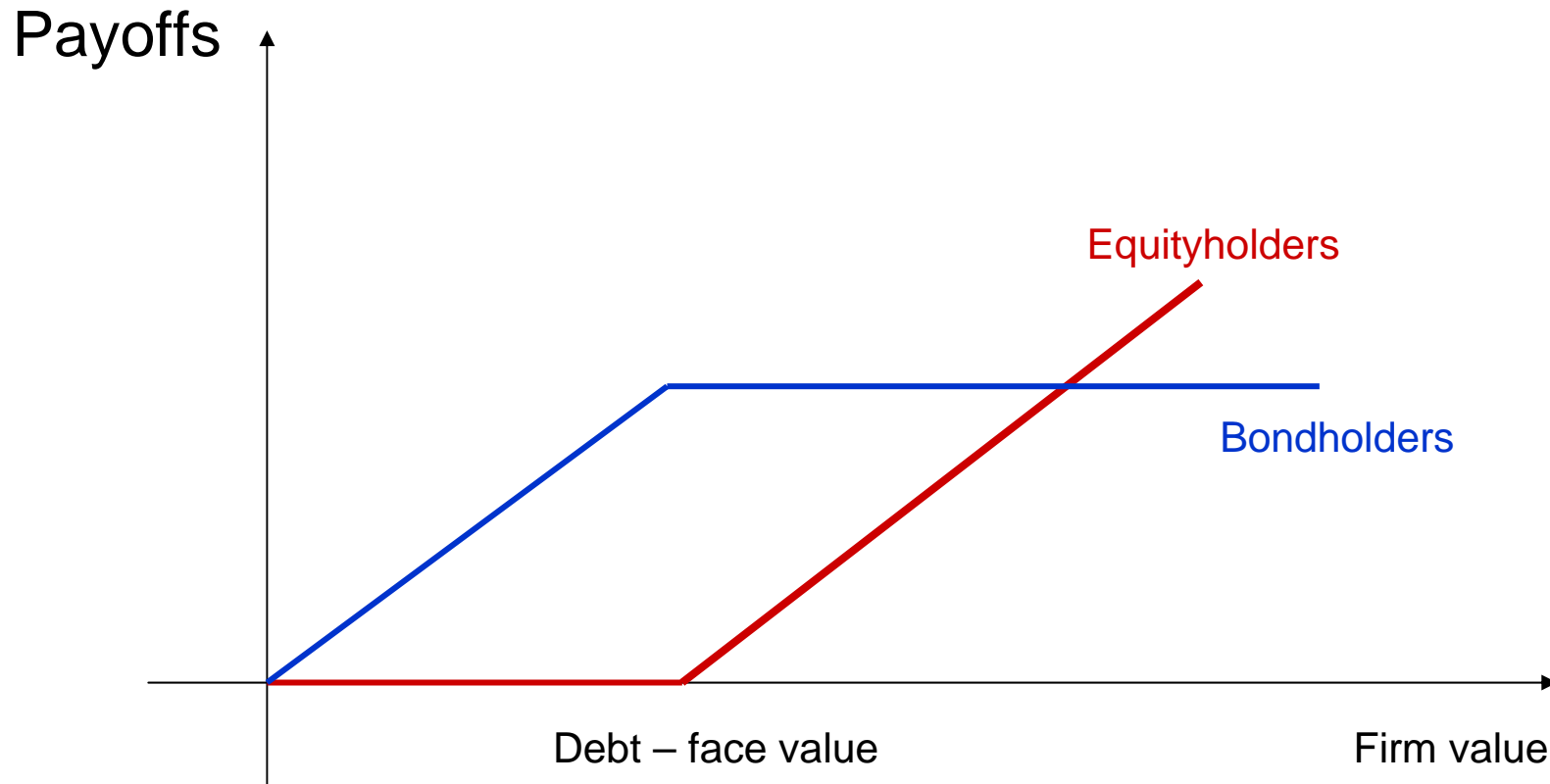
Structure of the Bond Market



2005 (Q3) U.S. Outstanding Public and Private Debt
Debt listed in trillions

Source: [The Bond Market Association](#)

Bondholders and Equityholders - Payoffs



- Basic Question:

What is the role of accounting earnings in the bond market?

- Given the bondholders' asymmetric payoff function, we predict that:

- Accounting losses are more relevant to bondholders than accounting profits

- Accounting earnings are more relevant when bonds are risky

- Burgsthaler and Dichev 1993 and Hayn 1995: document a non-linear relation between equity prices and accounting earnings
- Joos and Plesko 2006 – frequency of losses has increased over time
- Plumer and Tse 1997 – investigate non-linearities in the bond market using a small sample of bonds
- Datta et al 1993 – role of earnings changes conditional on dividend announcements

- We employ two sets of analyses:
 1. **Quarterly frequency of trades** – evaluate incidence of bond trade around earnings announcements (We also look at volume in a sensitivity test).
 2. **Annual bond returns - earnings associations**

1. Identify each earnings announcement
2. Select 30 trading days prior and after (bond-quarter event window)
3. Compute for each day in this period an indicator for each bond issue in the sample:

$T = 1$ if the bond issue is traded on that day

$= 0$ if the bond issue is not traded

4. Incidence of trade:
$$T_t = \frac{\sum_{q=1}^Q \sum_{i=1}^I T_{qit}}{\sum_{t=-30}^{30} \left[\sum_{q=1}^Q \sum_{i=1}^I T_{qit} \right]} \times 100$$

Q – quarters, I – bond issues, T =1 if issue is traded, 0 otherwise

5. Test statistic:
$$AbnT_{qt=event} = \frac{T_{qt=event} - m(T_{qt=non-event})}{\sigma(T_{qt=non-event})} \times 100$$

Where
$$T_{qt} = \frac{\sum_{i=1}^I T_{qit}}{\sum_{t=-30}^{30} \sum_{i=1}^I T_{qit}} \times 100$$
 and event = days +1, +2

- Annual Regressions:

$$R_{ijt} = \alpha_0 + \alpha_1 \times \frac{EARN_{it}}{MVF_{it-1}} + \varepsilon_{ijt}$$

- MVF = market value of equity + book value of debt
- EARN = earnings before extraordinary items
- R = adjusted bond returns

We add interactions for Losses and Speculative Grade Bonds

$$BR_{ijt} = \frac{BP_{ijt} + C_{ijt} - BP_{ijt-1}}{BP_{ijt-1}}$$

- **$BP(t)$** - invoice price within 60 days after the earnings ann; **$BP(t-1)$** - invoice price within 60 days after the previous earnings ann
- **$BP(t)$** = Flat Price + Accrued Interest
- **$C(t)$** - coupon payments during the interval
- **Adjustment:** Returns are adjusted for US Treasuries buy and hold returns matched by:
 - (1) maturity in years
 - (2) coupon rate

- Mergent FISD: 1994 to 2004
- Transactions data are supplied by the National Association of Insurance Commissioners
 - ***Main Advantage:*** We have actual transactions not dealer quotes or matrix prices
 - Insurance companies hold 1/3 of outstanding corporate bonds (source: Federal Reserve)
 - It is the only source of transaction data over such a long period (TRACE is only available from 2002)

Descriptives and Comparisons

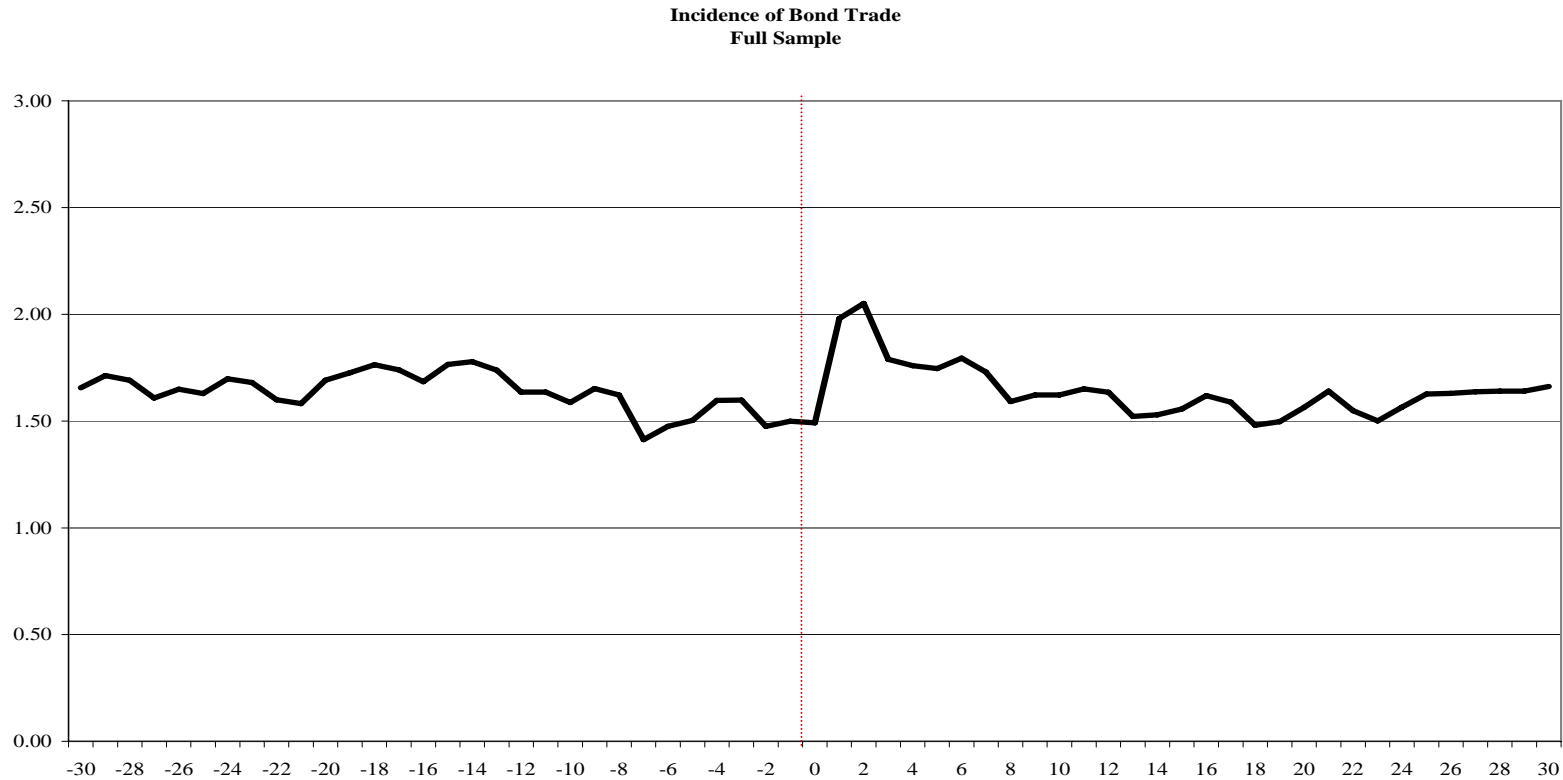
Panel A: Descriptive Statistics - Bond Sample

Variable	N	Mean	Std Dev	5th Pctl	25th Pctl	Median	75th Pctl	95th Pctl
<i>Mkt Value Equity (\$ Mil.)</i>	7166	18804.08	34758.06	347.71	2156.66	7140.51	17937.03	79074.30
<i>Firm Value (\$ Mil.)</i>	7166	25718.27	42974.63	867.41	4146.74	11498.87	24928.71	122464.24
<i>Bond Returns</i>	7166	0.086	0.108	-0.061	0.044	0.086	0.133	0.227
<i>Adjusted Bond Returns</i>	7166	0.013	0.105	-0.119	-0.014	0.010	0.044	0.152
<i>Earnings</i>	7166	0.023	0.049	-0.063	0.012	0.032	0.048	0.078
<i>Cash Flows</i>	7166	0.082	0.055	0.002	0.050	0.077	0.108	0.178
<i>Accruals</i>	7166	-0.058	0.059	-0.158	-0.082	-0.051	-0.024	0.012
<i>ΔEarnings</i>	7166	0.002	0.059	-0.072	-0.012	0.003	0.016	0.066
<i>ΔCash Flows</i>	7166	0.006	0.049	-0.068	-0.013	0.006	0.024	0.076
<i>ΔAccruals</i>	7166	-0.004	0.069	-0.101	-0.027	-0.004	0.017	0.087
<i>Loss Indicator</i>	7166	0.174	0.379	0.000	0.000	0.000	0.000	1.000
<i>Speculative Indicator</i>	7166	0.255	0.436	0.000	0.000	0.000	1.000	1.000

Panel B: Descriptive Statistics - COMPUSTAT Population

Variable	N	Mean	Std Dev	5th Pctl	25th Pctl	Median	75th Pctl	95th Pctl
<i>Mkt Value Equity (\$ Mil.)</i>	59895	1267.31	3771.15	3.36	24.49	120.76	664.09	6597.20
<i>Firm Value (\$ Mil.)</i>	59895	1720.74	4943.87	5.85	36.81	172.74	929.68	9133.38
<i>Earnings</i>	59895	-0.032	0.159	-0.352	-0.068	0.020	0.054	0.113
<i>Cash Flows</i>	59895	0.035	0.125	-0.187	-0.021	0.049	0.102	0.217
<i>Accruals</i>	59895	-0.066	0.126	-0.294	-0.101	-0.042	-0.006	0.081
<i>ΔEarnings</i>	59895	0.007	0.152	-0.197	-0.031	0.004	0.032	0.217
<i>ΔCash Flows</i>	59895	0.008	0.111	-0.157	-0.032	0.005	0.045	0.186
<i>ΔAccruals</i>	59895	-0.002	0.157	-0.229	-0.049	-0.004	0.038	0.232
<i>Loss Indicator</i>	59895	0.402	0.490	0.000	0.000	0.000	1.000	1.000

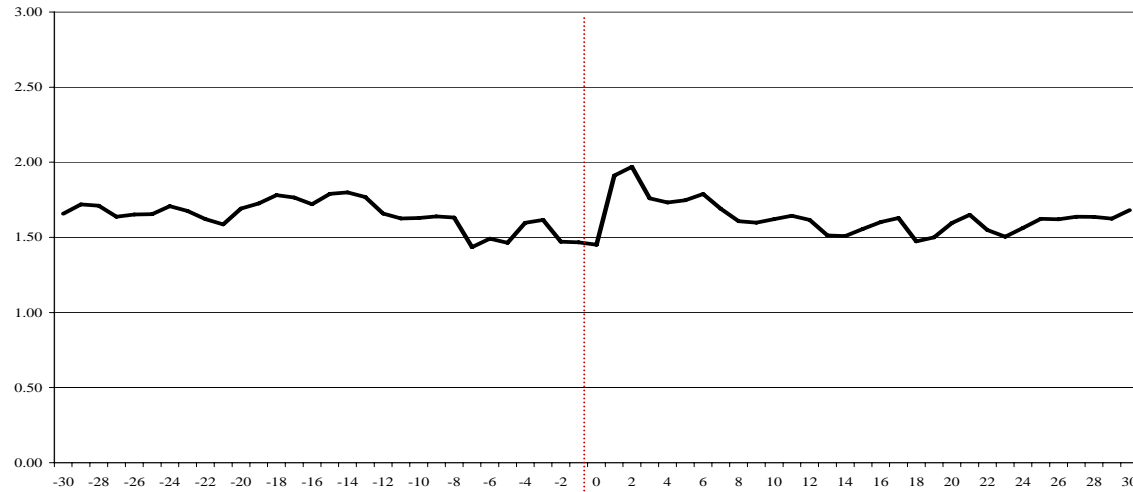
Trading Around Earnings Announcements



FULL SAMPLE

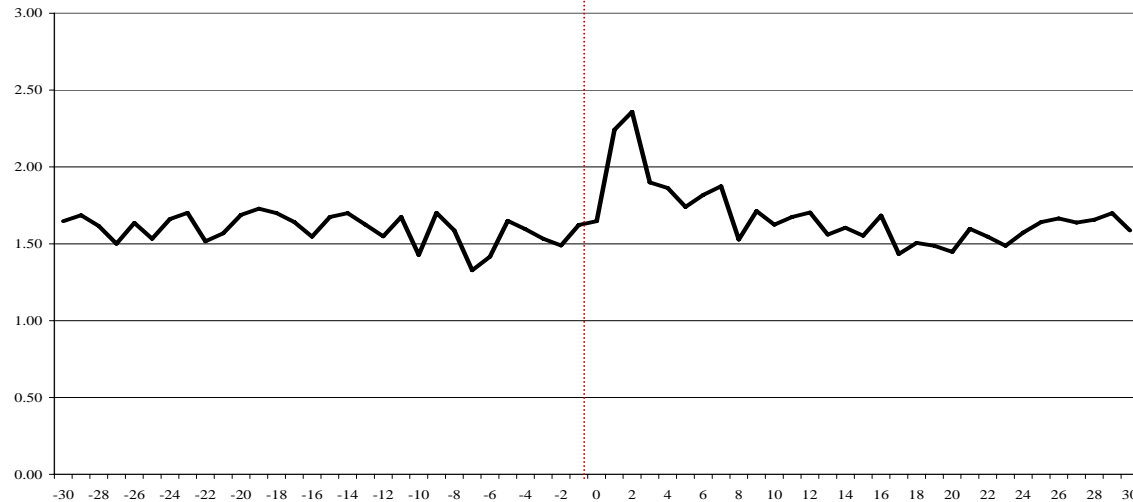
Incidence of Bond Trade
Profits

Profits

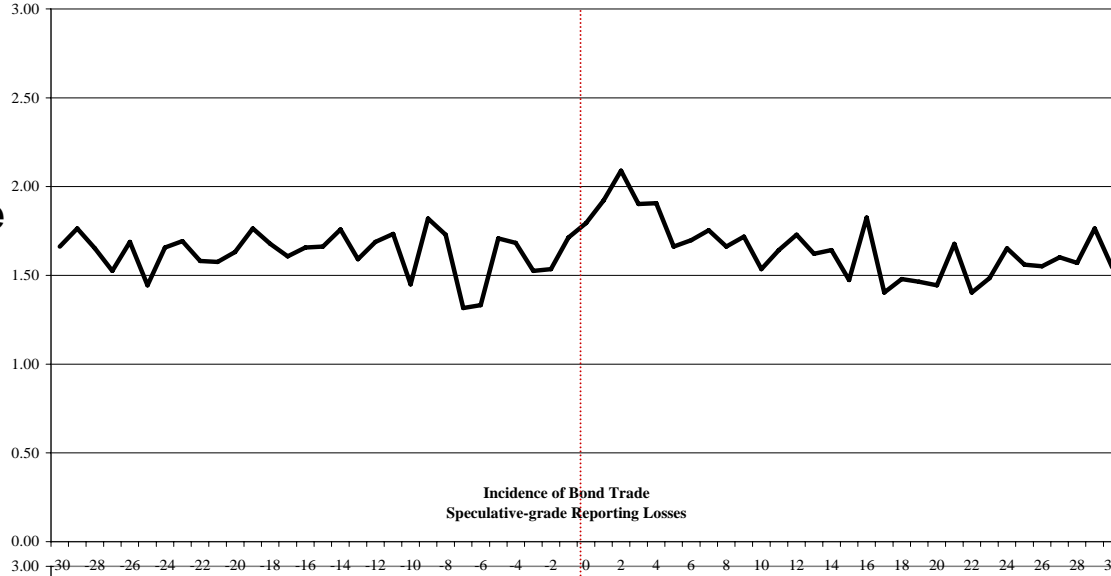


Incidence of Bond Trade
Losses

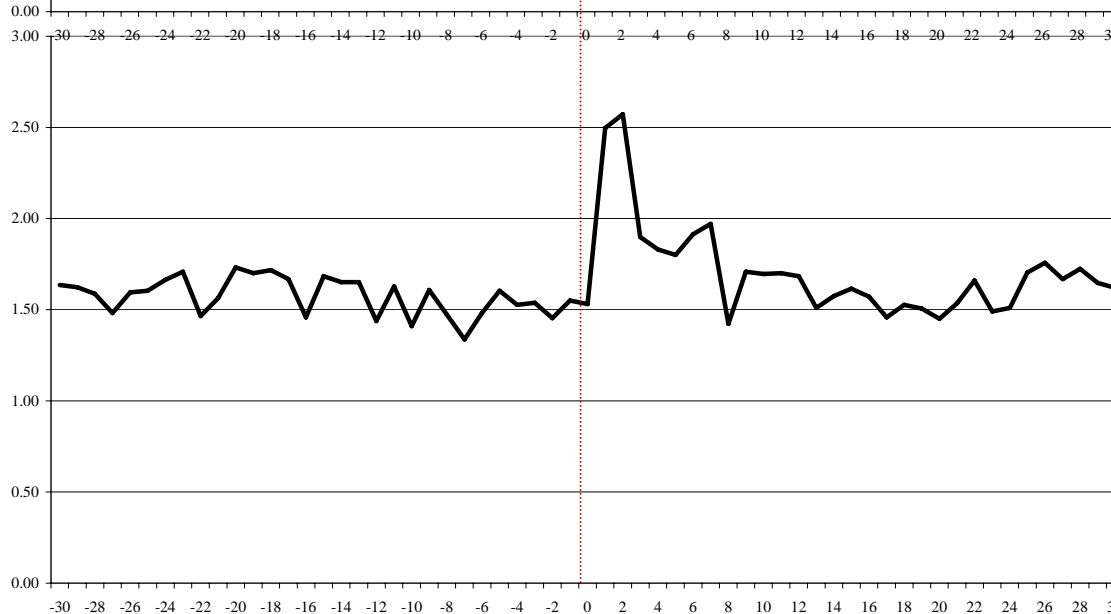
Losses



**Incidence of Bond Trade
Investment-grade Debt Reporting Losses**



**Incidence of Bond Trade
Speculative-grade Reporting Losses**



Losses & Invest Grade

Losses & Spec Grade

Regressions- Earnings Levels

<i>Earnings</i>	(+)	0.338*** (4.23)	-0.022 (-0.37)	0.261*** (3.75)	-0.041 (-0.68)
<i>Loss</i>	(-)		0.007 (0.66)		-0.022* (-1.89)
<i>Earnings * Loss</i>	(+)		0.663*** (3.60)		0.358** (2.06)
<i>Speculative</i>	?			0.028*** (4.25)	0.029*** (2.70)
<i>Earnings * Speculative</i>	(+)			0.277* (1.81)	0.090 (0.55)
<i>Speculative * Loss</i>	?				0.041** (2.14)
<i>Earnings * Loss * Speculative</i>	(+)				0.481 (1.55)

Regressions – Cash Flows and Accruals

<i>Cash Flows</i>	(+)	0.436*** (5.39)	0.007 (0.12)	0.337*** (4.69)	0.038 (-0.65)
<i>Accruals</i>	(+)	0.275*** (3.35)	-0.129* (-1.70)	0.192*** (2.83)	-0.166** (-2.02)
<i>Loss</i>	(-)		-0.014 (-0.92)		-0.055*** (-2.69)
<i>Cash Flows * Loss</i>	(+)		0.965*** (4.46)		0.756*** (3.54)
<i>Accruals * Loss</i>	(+)		0.664*** (3.57)		0.362** (2.16)
<i>Speculative</i>	?			0.023*** (2.56)	0.023* (1.90)
<i>Cash Flows * Speculative</i>	(+)			0.349** (2.16)	0.194 (1.13)
<i>Accruals * Speculative</i>	(+)			0.272* (1.78)	0.160 (0.97)
<i>Speculative * Loss</i>	?				0.058** (2.21)
<i>Cash Flows * Loss * Speculative</i>	(+)				0.366 (0.89)
<i>Accruals * Loss * Speculative</i>	(+)				0.429 (1.48)

- **Changes Specification:** We replicate the results using Earnings **Changes** (and also changes in components) – if returns relate to revisions in expectations
- **Persistent losses:** persistent losses should have a stronger association
- **Sample selection issues:** stock market data analyses should provide a “mirror image”. We re-run:
 - Volume analysis
 - Returns-earnings regressions
- **Control for contemporary stock returns** – earnings losses provide additional incremental information to bondholders

Persistent Vs. Transitory Losses: Loss Sample

Dependent Variable: Bond Returns

Panel A: Earnings Levels				Panel B: Earnings Changes			
Variable Names	(1)	(2)	(3)	Variable Names	(1)	(2)	(3)
<i>Earnings</i>	0.878*** (4.15)	0.219 (1.41)	0.172 (1.47)	Δ <i>Earnings</i>	0.803*** (4.52)	0.232* (1.77)	0.102 (0.59)
<i>Transit</i>	-0.084*** (-3.59)		-0.029 (-0.96)	<i>Transit</i>	-0.025 (-1.09)		-0.023 (-0.79)
<i>Earnings * Transit</i>	-0.538** (-2.11)		0.348 (1.06)	Δ <i>Earnings * Transit</i>	-0.514** (-2.54)***		0.140 (0.44)
<i>Speculative</i>		0.075*** (3.87)	0.087*** (3.40)	<i>Speculative</i>		0.042*** (2.53)	0.014 (0.69)
<i>Earnings * Speculative</i>		0.668*** (2.77)	0.993*** (3.86)	Δ <i>Earnings * Speculative</i>		0.534*** (2.94)	0.868*** (3.94)
<i>Speculative * Transit</i>			-0.069** (-2.06)	<i>Speculative * Transit</i>			0.014 (0.47)
<i>Earnings * Transit * Speculative</i>			-1.236*** (-2.74)	Δ <i>Earnings * Transit * Speculative</i>			-1.409*** (-3.32)
Year Fixed Effects	Yes	Yes	Yes		Yes	Yes	Yes
N	1244	1244	1244		1244	1244	1244
Adj R ²	22.64%	22.27%	24.22%		23.99%	24.32%	27.36%

Equity Returns - Replication

Panel A: Earnings Levels			
Variable Names	(1)	(2)	(3)
<i>Earnings</i>	2.256*** (12.58)	0.841*** (6.43)	1.724*** (6.01)
<i>Loss</i>	-0.005 (-0.20)		-0.027 (-0.65)
<i>Earnings * Loss</i>	-2.336*** (-11.90)		-1.394*** (-4.10)
<i>Speculative</i>		0.090*** (4.93)	-0.009 (-0.26)
<i>Earnings * Speculative</i>		-0.453*** (-3.09)	0.748** (2.00)
<i>Speculative * Loss</i>			0.017 (0.31)
<i>Earnings * Loss * Speculative</i>			-1.229*** (-2.88)
Year Fixed Effects	Yes	Yes	Yes
N	2959	2959	2959
Adj R ²	20.82%	17.55%	21.16%

Panel B: Earnings Changes			
Variable Names	(1)	(2)	(3)
Δ <i>Earnings</i>	0.932*** (9.49)	0.719*** (5.95)	0.676*** (4.04)
Δ <i>Loss</i>	-0.106*** (-4.74)		-0.105** (-2.52)
Δ <i>Earnings * Loss</i>	-0.711*** (-5.90)		-0.229 (-0.84)
Δ <i>Speculative</i>		0.051*** (2.95)	0.066*** (3.15)
Δ <i>Earnings * Speculative</i>		-0.231* (-1.71)	0.313 (1.51)
Δ <i>Speculative * Loss</i>			-0.030 (-0.59)
Δ <i>Earnings * Loss * Speculative</i>			-0.571* (-1.86)
Year Fixed Effects	Yes	Yes	Yes
N	2959	2959	2959
Adj R ²	19.27%	18.16%	21.16%

Control for Stock Returns

Panel A: Earnings Levels

Variable Names	(1)	(2)	(3)	(4)
<i>Earnings</i>	0.138** (2.12)	-0.200*** (-3.18)		
<i>Cash Flows</i>			0.191*** (2.91)	-0.186*** (3.08)
<i>Accruals</i>			0.105 (1.55)	-0.238*** (-3.45)
<i>Loss</i>		0.001 (0.15)		-0.021 (-1.57)
<i>Earnings * Loss</i>		0.601*** (3.81)		
<i>Cash Flows * Loss</i>				0.875*** (4.88)
<i>Accruals * Loss</i>				0.554*** (3.46)
<i>Stock Returns</i>	0.076*** (10.99)	0.077*** (11.13)	0.075*** (10.95)	0.076*** (11.12)
Year Fixed Effects	Yes	Yes	Yes	Yes
N	7071	7071	7071	7071
Adj R ²	25.35%	26.16%	25.52%	26.89%

Panel B: Earnings Changes

Variable Names	(1)	(2)	(3)	(4)
Δ <i>Earnings</i>	0.250*** (4.72)	0.102*** (2.98)		
Δ <i>Cash Flows</i>			0.279*** (4.69)	0.094** (2.35)
Δ <i>Accruals</i>			0.245*** (4.58)	0.103*** (2.85)
<i>Loss</i>		0.009 (1.53)		0.009* (1.63)
Δ <i>Earnings * Loss</i>		0.401*** (4.82)		
Δ <i>Cash Flows * Loss</i>				0.535*** (4.20)
Δ <i>Accruals * Loss</i>				0.381*** (4.51)
<i>Stock Returns</i>	0.072*** (11.20)	0.072*** (11.32)	0.072*** (11.15)	0.072*** (11.39)
Year Fixed Effects	Yes	Yes	Yes	Yes
N	7071	7071	7071	7071
Adj R ²	26.78%	27.80%	26.80%	27.91%

- ***Volume data:*** We also replicate the incidence of trade tests using volume data (prone to measurement errors)
- ***Bond Liquidity issues:***
 - re-run the results for the most liquid bond issue in the fiscal year
 - re-run the results using a value-weighted portfolio for each firm-year with multiple bond issues
- ***Expectation Model:*** use IBES analysts' forecasts at the beginning of the fiscal year

Results are robust to these alternative tests

- Findings
 1. There are large trading reactions around earnings announcements – reactions are larger for losses / speculative grade bonds
 2. Accounting earnings (and its components) is priced in bond returns
 3. Accounting earnings is more important when bonds are riskier
 4. Losses are more value relevant than profits

- We are the first to provide large sample evidence on the relation between accounting earnings and bond prices and trades.
- We provide indirect evidence on the “liquidation option hypothesis” and complement the results of Hayn 1995
- We provide another explanation for the “loss avoidance” phenomenon (e.g. Burgsthaler and Dichev 1997)
 - Firms with debt have strong incentives to avoid losses since they depress bond prices.

- Thanks for your comments!