# Playing Hardball

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he goal: introduce credit derivatives into corporate nance models of capital structure.

'he problem: Minimize inefficiencies of financial contracts for financially constrained firms

basic (simplified) financial contracting framework:

Risk-neutral firm needs $I$ at date 0 to produce returns at date 2

Date 1: Effort $e \in [0,1]$ by firm, return at date 2 is $\Pi$ with probability $e$ and $0$ otherwise

Liquidation value $L$ at date 1, $0$ at date 2

Effort costs $\psi(e)$

First best: $e^{FB}$ maximizes $e\Pi - \psi(e)$

(A Jeckling-type problem)

e simple contracting options:

ain long-term debt: maximize $e(\Pi - R) - \psi(e)$ $\rightarrow$ second-best

hort-term debt with face value *F (F = I)*: firm must default at date 1, hich leads either to liquidation (in the bad state) or to new contract n the good state).

ontinuation contract if *e* is public information: short-term debt with ce value *R* given by *eR = I*. Hence, firm maximizes

$$e(\Pi - R) - \psi(e) = e\Pi - I - \psi(e)$$

$\rightarrow$ first-best

ontinuation contract if *e* is private information by the firm: short-rm debt with face value *R* given by $e^{*}R = I$, where $e^{*}$ is the value f *e* optimally chosen by the firm: maximize

$$e(\Pi - R) - \psi(e)$$

$\rightarrow$ second-best

ng-term debt with face value $R$ and early liquidation option:

nder can either call the debt at date 1 or leave the contract in place ntil date 2.

lender is uninformed about $e \rightarrow$ no improvement over second-best

ow assume that lender knows $e$ ("relationship lending")

terim optimality:

leave the contract in place in the good state if and only if

$$eR \geq L \qquad (*)$$

terminate in the bad state if and only if

$$L \geq 0$$

bservation: Even if the lender can observe $e$, (*) is not binding if $L$ is nding if $L$ is sufficiently small.

ence, firm will to be allowed to go on and chooses $e$ to maximize

$$e(\Pi - R) - \psi(e)$$

$\rightarrow$ second-best, as before

## e main insight of this paper: Harden condition (*)

e liquidation decision at date 1 is an observable "credit event": the der can "insure" against this event at date 0 (pay $P$ upfront to a third ty, receive $C$ at date 1 in case of liquidation). Then condition (*) comes

$$eR \geq L + C$$

w fix $R$ by the lender’s zero-profit constraint,

$$e^{FB}R = I$$

d choose $C$ to satisfy

$$e^{FB}R = L + C$$

te that this insurance is not used in equilibrium in this simplified sion of the model) and

BINGO

## urther insights:

Insuring second-period credit events is sub-optimal.

For this finding one needs the renegotiation version of the above model.

Capital requirements for lenders force less well capitalized nders to take second-period credit protection (and see 1).

Credit protection strengthens lender incentives to invest in long-m relationships (defined by monitoring and collateral hancement)

## y appreciation of the paper

Modern credit risk theory meets good old corporate finance

And modern credit risk theory even benefits from the counter

The main idea is good and innovative. In particular, it helps

Praise for the clarity of the exposition and the stimulating

The link with regulatory capital requirements is somewhat artificial

What can this analysis teach us for the pricing of credit risk

Caution with institutional interpretation of the insurance contract:

e credit event in the model is triggered by the bank's calling the

# A problem with the renegotiation game:

the renegoatiation stage, the lender has information about *e*.

vould like to see the bargaining game between borrower, lender,