Litigation Risk and IPO Underpricing

Michelle Lowry
Penn State University

Susan Shu
Boston College

Presentation by Gennaro Bernile
Overview of

- Problem in hand and related literature
- Model proposed and problems with previous literature
- Data and Methodology
- Results and Conclusions
Persistent and systematic phenomenon:
IPO’s earn an average 15% return on the 1st trading day

Possible explanations:
- Signaling Theory
- Information Asymmetry Theory
- Litigation Risk Theory
Signaling Story:


• Little empirical support is found by Jegadeesh, Weinstein and Welch (1993), Garfinkel (1993); Spiess and Pettway (1997).
Information Asymmetry Story:

• *Benveniste and Spindt (1989); Beatty and Ritter (1986); Rock (1986); Baron (1982)*: higher cost of learning about the firm’s true value is associated with higher IPO underpricing.

• Evidence seems to support this explanation: *Hanley (1993); Megginson and Weiss (1991); Koh and Walter (1989); Beatty and Ritter (1986)*
Litigation Insurance Story

• *Ibboston (1975) and Tinic (1988)*: issuers intentionally underprice IPO’s to insure themselves against future liability.

Tinic model:

\[
E(Litigation\ Cost)_t = f(\frac{P_0}{P_t}) \cdot g(P_0 - P_t)
\]

s.t. \( g'(.) > 0 \) and \( f''(.) > 0 \)

• *Hughes and Thakor (1992); Hensler (1995)*: extend the model yielding similar predictions

Empirical testable prediction: positive relation between underpricing and litigation risk
Previous tests of the litigation insurance hypothesis:

- *Tinic (1988)*: compares underpricing of IPO’s prior and subsequent to the 1933 Securities Act (1923-1930 vs. 1966-71), finding that returns in the latter period are significantly higher.
Previous tests of the litigation insurance hypothesis (cont’d):

• *Drake and Vetsuypens (1993):* compare a sample of 93 IPO’s for which the issuers were subsequently sued with a “matched” sample of non-sued IPO firms (based on year, underwriter rank and offer size).

Main findings:

1. $E(R_0)_{\text{sued}} > E(R_0)_{\text{nonsued}}$

2. ($\#\text{sued}:\#\text{IPO's} / E(R_0)>0) > (\#\text{sued}:\#\text{IPOs} / E(R_0)\leq0)$

?? Endogeneity Problem??
Endogeneity Problem:
1) High Litigation Risk $\Rightarrow$ High Underpricing
2) High Underpricing $\Rightarrow$ Low Litigation Risk

Main contribution of the paper is in that it analyzes both ways the relation between Underpricing and Litigation Risk:

1) *litigation insurance hp*: does litigation risk affect issuer’s incentives to underprice?
2) *litigation deterrence hp*: does underpricing lower the probability of being sued?
The model:

1) Insurance effect:
\[ IR_i = \gamma_1 LR_i + \beta_1 X_{1i} + \epsilon_1 \]

2) Deterrence effect:
\[ LR_i = \gamma_2 IR_i + \beta_2 X_{2i} + \epsilon_2 \]

IR=Initial Return; LR=Litigation Risk; (X_2X_1)=exogenous variables
The Methodology (Maddala, 1983, ch8):

Structural Model:
(1) \( IR = \gamma_1 \ast LR + \beta_1 \ast X_1 + \varepsilon_1 \)
(2) \( LR = \gamma_2 \ast IR + \beta_2 \ast X_2 + \varepsilon_2 \)
where \( LR=1 \) if sued
\( LR=0 \) otherwise

Reduced Form:
(3) \( IR = \Pi_1 \ast X + \eta_1 \)
(4) \( LR = \Pi_2 \ast X + \eta_2 \)
where \( X = (X_1 \ X_2) \)
Since LR is only observed as a dichotomous variable ⇒ by probit can only estimate \( \frac{\Pi_2}{\sigma_2} \) where \( \sigma_2 = \text{Var}(\eta_2) \), and the Reduced Form is:

(3) \[ IR = \Pi_1 \times X + \eta_1 \]

(5) \[ LR' = LR / \sigma_2 = \frac{\Pi_2}{\sigma_2} \times X + \frac{\eta_2}{\sigma_2} = \Pi_2' \times X + \eta_2' \]

The Structural Model can now by be written as:

(6) \[ IR = \gamma_1 \sigma_2 \times LR' + \beta_1 \times X_1 + \varepsilon_1 \]

(7) \[ LR' = (\gamma_2 / \sigma_2) \times IR + (\beta_2 / \sigma_2) \times X_2 + (\varepsilon_2 / \sigma_2) \]
2-stage estimation procedure:

1\textsuperscript{st} - Estimate $\Pi_1$ in (3) by OLS and $\Pi_2'$ in (5) by probit ML $\Rightarrow \Pi_1$ and $\Pi_2$

2\textsuperscript{nd} - Estimate (6) by OLS after substituting $\Pi_2'*X$ for LR’ and estimate (7) by probit ML after substituting $\Pi_1*X$ for IR $\Rightarrow$

$\Rightarrow$Estimated Parameters:

- $\gamma_1 \sigma_2$
- $\beta_1$
- $\sigma_1$
- $\gamma_2/\sigma_2$
- $\beta_2/\sigma_2$
- $\sigma_{12}/\sigma_2$
DATA: Table 1, 2 and 3
Results

Litigation Insurance Hypothesis - Tab. 4
Results (cont’d)
Litigation Deterrence Hypothesis - Tab. 5/A
Results (cont’d)
Litigation Deterrence Hypothesis - Tab. 5/B
Conclusions:

- Evidence supports both Insurance and Deterrence Hp
- More importantly, highlights the importance of controlling for endogeneity of the explanatory variables employed
Return to FIN 533

http://schwert.ssb.rochester.edu/f533/f533main.htm