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Business and Economics

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Capital Gains Tax, Supply-driven Trading and Ownership Structure: Direct Evidence of the Lock-in Effect

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Introduction

- **Prior research theorizes the existence of a lock-in effect (e.g., Dyl, 1979)**
- **Prior research has tested for the existence of a lock-in effect (e.g., Reese, 1998; Ayers, Li and Robinson, 2008; Dai, Maydew, Shackelford and Zhang, 2008; Hanlon and Pinder, 2007)**
- **Prior research establishes that CGT influences year-end tax-planning strategies (e.g., Dyl, 1977)**



Motivation

- **The New Business Tax System (Capital Gains Tax) Act 1999**
 - 50% discount for individual investors
 - 33.33% discount for trusts/pension funds
- **Directly test for the lock-in effect by using:**
 - Bid-ask quotes; **AND**
 - Ownership structure data



Expectations

Selling pressure

- Observe an increase in seller-initiated trading following the qualification for discounted tax treatment
- This pressure is a declining function of the proportion of institutional investors
- Seller-initiated trading most evident in the first week of July

Price effects

- The selling pressure will translate to lower returns following the 12-month anniversary of listing
- Lower returns is a declining function of the proportion of institutional investors



Data collection

Initial public offerings

- **Firms listed on the ASX from January 2000 to December 2005**

Buy-sell order imbalance

- **Bid and ask quotes sourced from the ASX's Stock Exchange Automated Trading System (SEATS)**

Ownership structure

- **Individual ownership obtained from the ASX's Clearing House Electronic Subregister System (CHES)**



Method – Buy-sell order imbalance

$$BMS_{it} = \frac{Bought_{it} - Sold_{it}}{Bought_{it} + Sold_{it}}$$

where:

$Bought_{it}$ ($Sold_{it}$) is the number of shares traded due to buyer (seller) initiated trading for the i 'th firm during week t



Buy-sell order imbalance

Trade initiation

| PRICE | VOLUME |
|---------|-----------------|
| \$36.45 | 3000 |
| \$36.44 | 500 |
| \$36.33 | 1000 Ask |
| \$36.31 | 500 Bid |
| \$36.30 | 400 |
| \$36.29 | 600 |

And then a trade goes through for 300 shares at \$36.33



Buy-sell order imbalance

Trade initiation

| PRICE | VOLUME | |
|---------|--------|------------|
| \$36.45 | 3000 | |
| \$36.44 | 500 | |
| \$36.33 | 700 | Ask |
| \$36.31 | 500 | Bid |
| \$36.30 | 400 | |
| \$36.29 | 600 | |

And then a trade goes through for 200 shares at \$36.31



Buy-sell order imbalance

Trade initiation

| PRICE | VOLUME | |
|---------|--------|------------|
| \$36.45 | 3000 | |
| \$36.44 | 500 | |
| \$36.33 | 700 | Ask |
| \$36.31 | 300 | Bid |
| \$36.30 | 400 | |
| \$36.29 | 600 | |



Buy-sell order imbalance

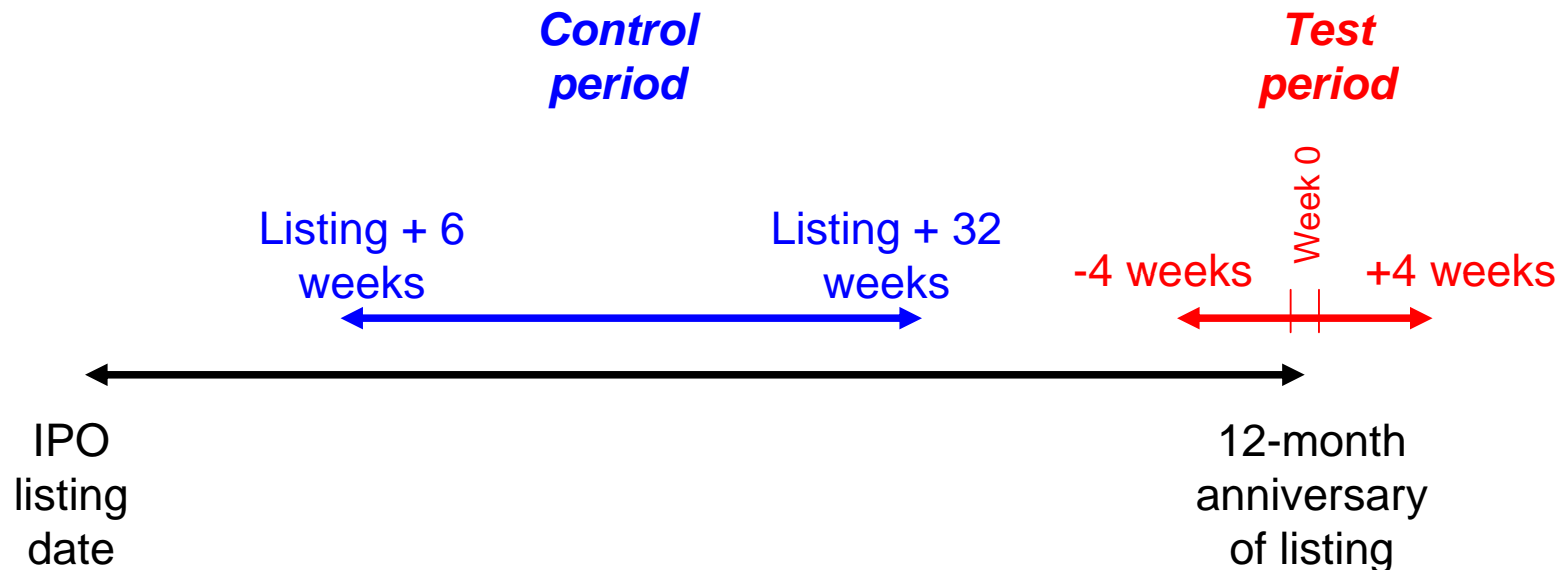
$$BMS_{it} = \frac{Bought_{it} - Sold_{it}}{Bought_{it} + Sold_{it}} = \frac{300 - 200}{200 + 300} = +0.2000$$

Evidence of selling pressure will show up in systematically **negative** values for BMS

But, what is the **expected** level of order imbalance?



Abnormal buy-sell order imbalance



$$AMS_{it} = BMS_{it} - \left[\sum_{t'=Listing+6weeks}^{+32weeks} \frac{Bought_{it'} - Sold_{it'}}{Bought_{it'} + Sold_{it'}} \right] \times \frac{1}{26}$$



Method – Selling pressure

$$AMS_{it} = \alpha_0 + \alpha_1 CG_{it} + \alpha_2 INST_{it} + \alpha_3 DIV_{it} + \alpha_4 POST_{it} + \alpha_5 CGPOST_{it} + \alpha_6 INSTPOST_{it} \\ + \alpha_7 DIVPOST_{it} + \alpha_8 FWJ_{it} + \alpha_9 ESCR_{it} + \varepsilon_{it}$$

- CG_{it}** natural log of the ratio of firm i 's share price immediately prior to the commencement of week t to the firm's subscription price;
- $INST_{it}$** proportion of total shares in firm i at the beginning of week t held by institutional investors;
- DIV_{it}** dummy variable of 1 if firm i announced a dividend in the first 12 months of listing, 0 otherwise;
- $POST_{it}$** dummy variable of 1 if observation occurred following the 12-month anniversary of listing, 0 otherwise;
- FWJ_{it}** dummy variable of 1 if the observation occurred following the 12-month anniversary and in the first trading week of July, 0 otherwise;
- $ESCR_{it}$** dummy variable of 1 if shares in firm i had been released from an escrow period in week t , 0 otherwise



Univariate results – Selling pressure

Panel A: Week-by-week analysis

| Week | AMS_{it} | |
|------|----------------------|---------------------|
| | Winners sub-sample | Losers sub-sample |
| -4 | 0.0365 (2.38)*** | -0.0094 (-0.36) |
| -3 | -0.0062 (1.02) | -0.0664 (-1.82)* |
| -2 | 0.0072 (1.41) | 0.0166 (0.23) |
| -1 | -0.0567 (-0.59) | -0.0154 (-0.54) |
| 0 | -0.0692 (-1.96)** | -0.0114 (0.16) |
| +1 | -0.0289 (-0.74) | 0.0192 (0.80) |
| +2 | -0.0318 (-0.90) | -0.0135 (0.12) |
| +3 | -0.0219 (-0.53) | 0.0335 (1.18) |
| +4 | -0.0377 (-0.95) | 0.0063 (0.56) |

***, ** and * indicates significance at the 1%, 5% and 10% levels respectively



Univariate results – Selling pressure

Panel B: Grouping weeks on pre and post 12-month anniversary basis

| | AMS_{it} | |
|---------------------------------------|--------------------|-------------------|
| | Winners sub-sample | Losers sub-sample |
| Pre-anniversary | -0.0048 | -0.0186 |
| Post-anniversary | -0.0379 | 0.0068 |
| T-test of means | (1.70)* | (0.97) |
| Kruskal-Wallis test of medians | [3.25]* | [0.49] |

** and * indicates significance at the 5% and 10% levels respectively



Multivariate results – Selling pressure

| | AMS_{it} |
|----------------------|----------------------|
| Intercept | 0.063 (0.165) |
| <i>CG</i> | -0.022 (0.450) |
| <i>INST</i> | -0.001 (0.117) |
| <i>DIV</i> | -0.023 (0.422) |
| <i>POST</i> | -0.157 (0.008)*** |
| <i>CGPOST</i> | 0.047 (0.222) |
| <i>INSTPOST</i> | 0.002 (0.014)** |
| <i>DIVPOST</i> | 0.015 (0.700) |
| <i>FWJ</i> | -0.286 (0.027)** |
| R² | 0.008 |
| F-stat | 2.03 (0.040)** |
| N | 2007 |



Method – Price effect

$$\begin{aligned} MAR_{it} = & \alpha_0 + \alpha_1 CG_{it} + \alpha_2 INST_{it} + \alpha_3 DIV_{it} + \alpha_4 POST_{it} + \alpha_5 CGPOST_{it} + \alpha_6 INSTPOST_{it} \\ & + \alpha_7 DIVPOST_{it} + \alpha_8 FWJ_{it} + \alpha_9 ESCR_{it} + \varepsilon_{it} \end{aligned}$$



Univariate results – Price effect

Panel A: Week-by-week analysis

| | MAR_{it} |
|------|-----------------------|
| Week | Winners Sub-sample |
| -4 | 0.0095 (2.30)** |
| -3 | 0.0031 (1.43) |
| -2 | -0.0017 (0.60) |
| -1 | -0.0045 (0.24) |
| 0 | -0.0053 (-1.15) |
| +1 | -0.0043 (-0.88) |
| +2 | -0.0064 (-1.30) |
| +3 | -0.0031 (-0.78) |
| +4 | -0.0103 (-2.03)** |

** and * indicates significance at the 5% and 10% levels respectively



Univariate results – Price effect

Panel B: Grouping weeks on pre and post 12-month anniversary basis

| | MAR_{it} |
|---|-------------------------------|
| | Winners sub-sample |
| Pre-anniversary | 0.0016 |
| Post-anniversary | -0.0059 |
| T-test of means | (1.97)** |
| Kruskal-Wallis test of medians | [3.80]* |

** and * indicates significance at the 5% and 10% levels respectively



Multivariate results – Price effects

| | |
|----------------------|----------------------|
| Constant | 0.022 (0.014)** |
| <i>CG</i> | -0.021 (0.005)*** |
| <i>INST</i> | -0.000 (0.324) |
| <i>DIV</i> | -0.006 (0.275) |
| <i>POST</i> | -0.037 (0.002)*** |
| <i>CGPOST</i> | 0.024 (0.007)*** |
| <i>INSTPOST</i> | 0.000 (0.143) |
| <i>DIVPOST</i> | 0.011 (0.130) |
| <i>FWJ</i> | 0.007 (0.696) |
| <i>ESCR</i> | 0.007 (0.603) |
| R² | 0.010 |
| F-stat | 2.23 (0.018)** |
| N | 2007 |

***, ** and * indicates significance at the 1%, 5% and 10% levels respectively



Summary and conclusions

- **Evidence exists of the lock-in effect**
 - Selling pressure evident when investors become entitled to a CGT discount on long-term capital gains
 - Such pressure is a declining function of the proportion of institutional ownership
 - Selling pressure evident after controlling for year-end tax-planning strategies
- **Limited evidence that selling pressure generates a negative price effect**