Are there valuation and operating performance gains from international cross listing?

Evidence from Taiwan’s depositary receipt issuers

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Introduction and summary

✦ Purpose: investigate if there are valuation and operating performance gains from international cross listing.

✦ Hypotheses:
  - market segmentation: positive effect.
  - disadvantaged markets: positive effect.
  - capital structure and market-timing: negative effect.

✦ Findings: strong evidence of negative valuation and operating performance effect.
Introduction and summary

Implication:
- firms time their issue of depositary receipts strategically during period of strong performance.
- benefits of international cross listing not as significant as previously thought.

Contribution:
- Among the first to find significant and negative valuation and operating performance effects of DR issue.
- Cast doubt on benefits of international cross listing as DR issuers from Taiwan should be in a solid position to have valuation gains by listing their shares in the US, the UK and Luxemburg markets.
- Of practical relevance in view of the current debate on the costs and benefits of international cross listing.
Organization of this paper

- Introduction and summary
- Data
- Methodology
- Evidence
- Conclusion
Data

- Sample: 55 Taiwanese firms that issued deposit receipts for the first time in the US, the UK and Luxemburg from 1992 to 2009.

- DR issuers from Taiwan should be in a solid position to garner valuation gains and other benefits by listing their shares in the US, the UK and Luxemburg markets.
Methodology: valuation effect

Three measures

- **Tobin’s q:**
  - periods: 3 years after issue vs. 3 year average before issue.
  - method: Fixed effect panel regression

- Holding period returns
  - periods: 1 year before issue and 3 years after issue.
  - method: Wilcoxon and t tests

- Cumulative abnormal returns (CAR)
  - periods: $[-100, -1], [0, +30], [0, +100], [0, +250]$ and $[-100, +250]$.
  - method: Wilcoxon and t tests
Methodology: operating performance effect

- Operating performance effect:
  - Measures: ROA, ROE, CFROA, ROS, EBITDA/TA, AT.
  - Periods: 3 years after issue vs. 3 year average before issue.
  - Method: Fixed effect panel regression.
Methodology: benchmarks

- Two benchmarks to control for the changes in industry-wide and economy-wide business conditions.
  - The *industry*: other firms in the issuer’s industry.
  - *The matched firm*:
    - a firm in the same industry
    - has a book value most comparable to the DR issuer
Methodology: panel regression

Data have two dimensions:
- cross-sectional observations (DR issuer)
- time-series observations (year relative to DR issue)

Panel specification:

\[ y_{it} = \alpha + \alpha_i + \beta_1 dr_1 + \beta_2 dr_2 + \beta_3 dr_3 + e_{it} \]

- \( y_{it} \): Tobin’s q or performance measures for firm \( i \) in the year \( t \) (year relative to DR issue)
- \( dr_j \): =1 if the year is year \( j \) after issue; = 0 otherwise.
- \( j \): event year between +1 and +3 relative to the issue year.
Methodology: panel regression

- If estimated coefficient for year $j$ is negative $\rightarrow$ Tobin’s $q$ or performance measure decreases compared to its average over the three years before issue.

  - redundant fixed-effects test $\rightarrow$ fixed-effects panel regression.
  - random-effects regression $\rightarrow$ results are similar $\rightarrow$ findings are not contingent on effect specification.
Methodology: cumulative abnormal returns (CAR)

- Regression model: \( R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \)
  
  \( t = -250 \) to \(-101\) days relative to the date of issue.

  \( R_{it} \): stock returns of issuer \( i \) in day \( t \)

  \( R_{mt} \): returns of Taiwan’s stock market index in day \( t \).

- \( CAR \) for five event periods \((E)\):
  \([-100, -1]\), \([0, +30]\), \([0, +100]\), \([0, +250]\) and \([-100, +250]\)

\[
CAR_{iE} = \sum_{E} (R_{iE} - \hat{\alpha}_i - \hat{\beta}_i R_{mE})
\]
Evidence: valuation effect

- Evidence from *Tobin’s q* (table 4)
  - unadjusted *Tobin’s q* decreases by:
    - 39.1% in the first year (significant at 1%)
    - 37.9% in the first two years (significant at 1%)
    - 56.1% in first three years (significant at 1%)
  - matched-firm-adjusted *Tobin’s q* decreases by:
    - 64.5% in the first year (significant at 1%)
    - 70.6% in the first two years (significant at 1%)
    - 90.0% in first three years (significant at 1%)
Table 4. DR issue on *Tobin’s q*

<table>
<thead>
<tr>
<th>Panel A. Unadjusted Tobin’s <em>q</em></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Adjusted R²</th>
<th>( \chi^2 )(54) p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Pre-issue average</td>
<td>+1</td>
<td>+2</td>
<td>+3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>299</td>
<td>2.444</td>
<td><strong>-0.957</strong> (0.084)</td>
<td><strong>-0.926</strong> (0.155)</td>
<td><strong>-1.370</strong> (0.173)</td>
<td>0.501</td>
<td>252.6 [0.000]</td>
</tr>
</tbody>
</table>

Panel B. Industry-adjusted *Tobin’s q*

<table>
<thead>
<tr>
<th>N</th>
<th>Pre-issue average</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
<th>Adjusted R²</th>
<th>( \chi^2 )(54) p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>272</td>
<td>-0.140</td>
<td>0.009 (0.140)</td>
<td>-0.063 (0.141)</td>
<td>-0.139 (0.135)</td>
<td>0.459</td>
<td>230.0 [0.000]</td>
</tr>
</tbody>
</table>

Panel C. Matched-firm-adjusted *Tobin’s q*

<table>
<thead>
<tr>
<th>N</th>
<th>Pre-issue average</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
<th>Adjusted R²</th>
<th>( \chi^2 )(54) p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>279</td>
<td>1.057</td>
<td><strong>-0.682</strong> (0.178)</td>
<td><strong>-0.746</strong> (0.209)</td>
<td><strong>-0.955</strong> (0.236)</td>
<td>0.520</td>
<td>243.7 [0.000]</td>
</tr>
</tbody>
</table>

Decreases of 39.137%, 37.889% and 56.056%

Decreases of 64.532%, 70.577% and 90.035%
Evidence: valuation effect

- Evidence from three-year holding period returns after issue (table 5)
  - Market-adjusted returns:
    - mean = -49.5% (significant at 1%)
    - median = -46.0% (significant at 1%)
  - Industry-adjusted returns:
    - mean = -54.3% (significant at 1%)
    - median = -50.6% (significant at 1%)
  - Matched-firm-adjusted returns:
    - mean = -15.5% (significant at 10%)
    - median = -0.1% (not significant)
# Table 5. holding period returns

<table>
<thead>
<tr>
<th>holding period</th>
<th>pre-issue[-252, -60]</th>
<th>post-issue[+1, +3*252]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A. Market-adjusted returns</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.068 (1.369)</td>
<td>-0.495&lt;sup&gt;a&lt;/sup&gt; (-6.991)</td>
</tr>
<tr>
<td>Median</td>
<td>0.046 [1.000]</td>
<td>-0.469&lt;sup&gt;a&lt;/sup&gt; [5.227]</td>
</tr>
</tbody>
</table>

The three-year holding period returns after DR issue are negative and the long-term valuation effects of DR issuance is negative.

| **Panel C. Matched-firm-adjusted returns** |                         |
| Mean                   | 0.103<sup>a</sup> (3.203) | -0.155<sup>c</sup> (-1.681) |
| Median                 | 0.013<sup>a</sup> [2.900]  | -0.001 [-1.417]              |

Significant at the 1% level.
Evidence: valuation effect

* Evidence from *CAR* (table 6)
  - \([0, +30] = -4.3\%\) (significant at 1%)
  - \([0, +100] = -13.5\%\) (significant at 1%)
  - \([0, +250] = -32.0\%\) (significant at 1%)
  - \([-100, +250] = -30.2\%\) (significant at 5%)
Table 6. CAR

<table>
<thead>
<tr>
<th>Event Period</th>
<th>Mean(CAR)</th>
<th>Z(CAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[-100, -1]</td>
<td>0.013</td>
<td>0.26</td>
</tr>
<tr>
<td>[0, +30]</td>
<td>-0.043</td>
<td>-2.70</td>
</tr>
<tr>
<td>[0, +100]</td>
<td>-0.135</td>
<td>-3.43</td>
</tr>
<tr>
<td>[0, +250]</td>
<td>-0.320</td>
<td>-3.12</td>
</tr>
<tr>
<td>[-100, +250]</td>
<td>0.302</td>
<td>-2.11</td>
</tr>
</tbody>
</table>

The valuation effects of DR issuance, measured by the cumulative abnormal returns, is negative.  

significant at the 1% level

significant at the 10% level
Evidence: operating performance effect

- unadjusted performance measure (table 7)
- industry-adjusted performance measure (table 8)
- matched-firm-adjusted performance measure (table 9)

- majority of the performance measures deteriorate substantially after issue.
Table 7. DR issue on unadjusted operating performance

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Pre-issue average</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
<th>Adj. R²</th>
<th>$X^2 (54)$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>317</td>
<td>0.091</td>
<td>-0.019 a (0.005)</td>
<td>-0.043 a (0.005)</td>
<td>-0.048 a (0.005)</td>
<td>0.598</td>
<td>337.4 [0.000]</td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>317</td>
<td>0.147</td>
<td>-0.028 a (0.009)</td>
<td>-0.072 a (0.009)</td>
<td>-0.092 a (0.009)</td>
<td>0.488</td>
<td>260.4 [0.000]</td>
<td></td>
</tr>
<tr>
<td>OCF/TA</td>
<td>316</td>
<td>0.101</td>
<td>0.006 b (0.003)</td>
<td>-0.014 a (0.003)</td>
<td>0.002 (0.003)</td>
<td>0.515</td>
<td>290.7 [0.000]</td>
<td></td>
</tr>
<tr>
<td>NI/Sales</td>
<td>317</td>
<td>0.120</td>
<td>-0.005 (0.014)</td>
<td>-0.075 (0.014)</td>
<td>-0.080 (0.014)</td>
<td>0.357</td>
<td>191.5 [0.000]</td>
<td></td>
</tr>
<tr>
<td>EBITDA/Sales</td>
<td>314</td>
<td>0.237</td>
<td>-0.007 (0.006)</td>
<td>-0.058 a (0.006)</td>
<td>-0.005 (0.006)</td>
<td>0.599</td>
<td>344.7 [0.000]</td>
<td></td>
</tr>
<tr>
<td>Sales/TA</td>
<td>317</td>
<td>0.880</td>
<td>-0.079 a (0.019)</td>
<td>-0.095 a (0.019)</td>
<td>-0.028 (0.020)</td>
<td>0.840</td>
<td>643.7 [0.000]</td>
<td></td>
</tr>
</tbody>
</table>
Table 8. DR issue on industry-adjusted operating performance

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Pre-issue average</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
<th>Adj. R²</th>
<th>$X^2$ (54)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>317</td>
<td>0.026</td>
<td>-0.021&lt;sup&gt;a&lt;/sup&gt; (0.001)</td>
<td>-0.033&lt;sup&gt;a&lt;/sup&gt; (0.002)</td>
<td>-0.039&lt;sup&gt;a&lt;/sup&gt; (0.003)</td>
<td>0.570</td>
<td>319.7</td>
<td>0.000</td>
</tr>
<tr>
<td>ROE</td>
<td>317</td>
<td>0.042</td>
<td>-0.029&lt;sup&gt;a&lt;/sup&gt; (0.004)</td>
<td>-0.055&lt;sup&gt;a&lt;/sup&gt; (0.005)</td>
<td>-0.077&lt;sup&gt;a&lt;/sup&gt; (0.005)</td>
<td>0.454</td>
<td>243.2</td>
<td>0.000</td>
</tr>
<tr>
<td>OCF/TA</td>
<td>316</td>
<td>0.017</td>
<td>-0.003 (0.003)</td>
<td>-0.020&lt;sup&gt;a&lt;/sup&gt; (0.003)</td>
<td>-0.005&lt;sup&gt;c&lt;/sup&gt; (0.003)</td>
<td>0.522</td>
<td>294.3</td>
<td>0.000</td>
</tr>
<tr>
<td>NI/Sales</td>
<td>317</td>
<td>0.034</td>
<td>-0.006 (0.008)</td>
<td>-0.063&lt;sup&gt;a&lt;/sup&gt; (0.008)</td>
<td>-0.067&lt;sup&gt;a&lt;/sup&gt; (0.008)</td>
<td>0.354</td>
<td>192.6</td>
<td>0.000</td>
</tr>
<tr>
<td>EBITDA/Sales</td>
<td>314</td>
<td>0.068</td>
<td>-0.008 (0.005)</td>
<td>-0.049&lt;sup&gt;a&lt;/sup&gt; (0.005)</td>
<td>-0.040&lt;sup&gt;a&lt;/sup&gt; (0.005)</td>
<td>0.575</td>
<td>327.9</td>
<td>0.000</td>
</tr>
<tr>
<td>Sales/TA</td>
<td>317</td>
<td>0.131</td>
<td>-0.077&lt;sup&gt;a&lt;/sup&gt; (0.012)</td>
<td>-0.097&lt;sup&gt;a&lt;/sup&gt; (0.011)</td>
<td>-0.044&lt;sup&gt;a&lt;/sup&gt; (0.011)</td>
<td>0.856</td>
<td>676.2</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Table 9. **DR issue on matched-firm-adjusted operating performance**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Pre-issue average</th>
<th>Adj. R²</th>
<th>$\chi²$ (54)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROA</strong></td>
<td>291</td>
<td>0.044</td>
<td></td>
<td>0.423</td>
<td>209.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.044</td>
<td></td>
<td></td>
<td>[0.000]</td>
</tr>
<tr>
<td><strong>ROE</strong></td>
<td>291</td>
<td>0.094</td>
<td></td>
<td>0.215</td>
<td>120.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.094</td>
<td></td>
<td></td>
<td>[0.000]</td>
</tr>
<tr>
<td><strong>OCF/TA</strong></td>
<td>290</td>
<td>0.037</td>
<td></td>
<td>0.316</td>
<td>162.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.037</td>
<td></td>
<td></td>
<td>[0.000]</td>
</tr>
<tr>
<td><strong>NI/Sales</strong></td>
<td>290</td>
<td>0.171</td>
<td></td>
<td>0.082</td>
<td>73.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.171</td>
<td></td>
<td></td>
<td>[0.016]</td>
</tr>
<tr>
<td><strong>EBITDA/Sales</strong></td>
<td>275</td>
<td>0.093</td>
<td></td>
<td>0.158</td>
<td>97.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.093</td>
<td></td>
<td></td>
<td>[0.000]</td>
</tr>
<tr>
<td><strong>Sales/TA</strong></td>
<td>296</td>
<td>-0.057</td>
<td></td>
<td>0.575</td>
<td>308.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.057</td>
<td></td>
<td></td>
<td>[0.000]</td>
</tr>
</tbody>
</table>

Panel regression results indicate that the effects of DR issue on operating performance is negative.
Conclusion

Finding: strong evidence of negative valuation effect and operating performance effects.

Implication:
- do not support market segmentation and disadvantaged market hypotheses.
- firms time their issue of depositary receipts during period of strong performance.
- DR issuers from Taiwan should be in a solid position to have valuation gains and positive performance effects → cast doubt on benefits of international cross listing.
THANKS FOR LISTENING