The Asset Growth Anomaly and the Role of Limits to Arbitrage

by Eric Lam and John Wei

Discussion by Pengjie Gao*

*University of Notre Dame

2009 Western Finance Association Meeting
Overview

• Empirical Fact
  • High asset growth (AG) firms earn lower “risk-adjusted” returns
    • See: Titman, Wei and Xie (JFQA, 2004); Cooper, Gulen and Schill (JF, 2008)

• Why? (an incomplete list of possible reasons)
  • New factor: investment growth rate is a new and pervasive factor
    • See: Li, Livdan and Zhang (RFS, 2008); Chen and Zhang (JF, 2009)
  • Investor underreaction to managerial heuristics / agency problems – *this paper*.

• It is an extremely important exercise to sort out these two hypotheses
  • It advances our understanding of a basic corporate decision’s impact on equity returns
  • The question is how to do it?
Summary

- Lam and Wei (2009) explore cross sectional variations of returns of the assets growth rates sorted portfolios
  - The conditioning variables (i.e., “sorting variables”) attempt to capture the idea of “limits-to-arbitrage”

- **Main idea:** when there is limits-to-arbitrage, the initial “mis-reaction” is most difficult to be arbitraged (i.e., corrected), asset growth anomaly should be strongest

- See: De Long et al. (JPE, 1990); Pontiff (QJE, 1995); Shleifer and Vishny (JF, 1997); Stein (2009)

- Empirical execution is very well done; a lot of hard work; exposition is easy to follow; coverage of literature is impressive.
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<thead>
<tr>
<th></th>
<th>Negatives</th>
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<td></td>
<td>Low</td>
<td>High</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>High</td>
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<td>0.03</td>
<td>−0.00</td>
<td>0.09</td>
<td>0.07</td>
<td>−0.01</td>
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<td>0.17</td>
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<td>0.06</td>
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### Sorting on Asset Growth, \( dA/A \)

#### Average Value-Weight Returns

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<td>0.27</td>
<td>0.17</td>
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<td>0.19</td>
<td>0.04</td>
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#### \( t \)-statistics for Average Value-Weight Returns

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<td>3.73</td>
<td>3.26</td>
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<td>2.28</td>
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#### \( t \)-statistics for Average Equal-Weight Returns

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<td>2.28</td>
<td>−0.41</td>
<td>−1.41</td>
<td>−1.16</td>
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Source: Fama-French (JF, 2008)
“Limits-to-Arbitrage Score” (LARB) = Σ1{idiosyncratic volatility, credit rating, price}

<table>
<thead>
<tr>
<th>LARB</th>
<th>Return (%)</th>
<th>1 (low)</th>
<th>10 (high)</th>
<th>1-10</th>
<th>t(1-10)</th>
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<td>1.221***</td>
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<td></td>
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<td></td>
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<td>0.199</td>
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<td>3</td>
<td>Raw</td>
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<td>0.383</td>
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<td>4 (high)</td>
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<td>0.002</td>
<td>1.644***</td>
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<td>-1.091***</td>
<td>1.145***</td>
<td>[3.83]</td>
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“Limits-to-Arbitrage Score” and its Constituents: Identification Issues (1)

- To differentiate investment-based argument vs. behavioral bias argument, we need to find a set of instruments such that

1. They are correlated with naïve investors’ behavioral bias; or, they are correlated with sophisticated investors’ arbitrage risk

2. They are uncorrelated with (current and future) investment decisions

(i.e., “Identification Restrictions”)
“Limits-to-Arbitrage Score” and its Constituents: Identification Issues (2)

- “limits-to-arbitrage score (LARB)” and its constituents currently do not satisfy such identification restrictions

- **Credit Rating Availability:**
  1. strongly related to firm size → investment decisions
  2. available of credit rating captures financing constraints → investment decisions
     - See: Faulkender and Petersen (RFS, 2006)

- **Idiosyncratic Volatility (IVOL):** high IVOL firms are likely to face financial constraints → investment decisions
  - See: Gao and Yun (2009, Working Paper): imperfect substitution of commercial paper with lines of credit among set of high IVOL firms during recent financial crisis
“Limits-to-Arbitrage Score” and its Constituents: Identification Issues (3)

- **Nominal Share Price:**
  It might be a good instrument to capture preference of retail investors through the “nominal price catering”, or “lottery gambling”, or “institutional investor mandate” channel
  - See: Baker, Greenwood and Wurgler (JF, forthcoming); Kumar (JF, forthcoming); Da and Gao (JFQA, Forthcoming)

On the other hand, if share price affects shareholder base, it may affect corporate governance → investment decisions
  - See: Bodnaruk and Yun (2008, Working Paper) for former channel; Bertrand and Mullainathan (JPE, 2003) on latter channel

In addition, share prices affects firm’s acquisition outcomes via “anchoring” channel ←→ investment decisions
Example: Availability of LT Credit Rating and Average Asset Size (Sample Period – 1990 to 2008)

Source: Discussant’s calculations

Pengjie Gao, University of Notre Dame

WFA 2009 Discussion
Example: Availability of LT Credit Rating and Asset Growth Rate Differences (Sample Period – 1990 to 2008)

Without credit rating, Asset Growth Rate Difference = 130%

With credit rating, asset Growth Rate Difference = 90%

Source: Discussant’s calculations

Pengjie Gao, University of Notre Dame

WFA 2009 Discussion
Where is the real “limits-to-arbitrage”? (1)

• How important are the transaction costs?
  • I imagine the marginal arbitragers are “sophisticated” investors.
  • Here are some transaction cost estimates of “sophisticated” investors (i.e., “first order transaction costs” for “marginal” traders).
  • It does not seem to matter too much for “limits-to-arbitrage”.

Exhibit 1. The all-in cost of passive limit orders

Benchmark Returns
AG strategy: all stocks with market cap > 500M
AG strategy cumulative return from 01/2007 to 09/2008 = 4.8%
Not too bad for quantitative funds.

Source: Goldman Sachs Equity Execution Research (2009)
Source: Discussant’s calculations
Where are the real “limits-to-arbitrage”? (2)

• Where are the real “limits-to-arbitrage”?  
  • One insights from Shleifer and Vishny (JF, 1997) is about divergence risk and limited access to capital.
  
    “We know our position is going to converge in five years, but we do not know when.” – A former partner from LTCM

• Divergence Risk: spreads may widen before convergence, while the limited access to capital (i.e., “funding liquidity”) may imply deleveraging, assets fire sales, etc... [see, Stein (2009)]

• I illustrate the divergence risk using AG strategy returns during the recent “quant crisis” in the August of 2007

• Modeling Approaches
  
  • Mitch, Pulvino and Stafford (JF, 2002) : consider a simple hypothetical hedge fund

Where are the real “limits-to-arbitrage”? (3)

Cumulative Returns of Trading Strategy Based on Assets Growth:
August 1, 2007 to August 31, 2007 ("Quant Crisis")

AG EW Strategy Daily Return $\sigma = 28$ bpts
August 7, 2007: $-4\sigma$
August 8, 2007: $-5\sigma$
August 9, 2007: $-8\sigma$

Source: Discussant’s calculations
Where are the real “limits-to-arbitrage”? (4)

Cumulative Returns of Trading Strategy Based on Assets Growth:
August 1, 2007 to August 31, 2007 (“Quant Crisis”)

Divergence Risk Related Returns ≈ -3%
AG Strategy Returns ≈ -4%

Source: Discussant’s calculations
Final Remarks

- Well-written paper that asks interesting questions and provides equally interesting evidence.
  - I enjoyed it.

- It would be very interesting to see a “punch line”.
  - The “punch line” is to differentiate rational vs. behavioral stories about the asset growth anomaly.

- This paper is moving one step closer towards this direction
  - It could use more contemplations.
Minor Issues (for authors only)

- If you’re to consider the transaction costs directly, you should probably consider price impact costs – which seem to be more important than the bid/ask spreads
  - Breen et al. (2004, Management Science) provides a simple way of estimating the price impact costs
  - It is likely that their price impact costs are too high for the latter sample period after 2002.

- How binding are the short-sale constraints?
  - Looking at the second to last table, the LARB scores suggest almost all of the profits come from the short side (the long side is small and statistically insignificant).

- Based on Fama and French (2008), it is better to use *per share* asset growth rate as the sorting variable and construct the AG portfolios
  - This approach net out issuance related effect.
Minor Issues, continued (for authors only)

- Table VI: Fama-MacBeth Regression
  - You may want to interact TAG with ln(SIZE). Given the strong correlation between these measures and size, controlling for size seems to be necessary to sort out incremental contribution.
  - It seems reasonable to argue that recent period’s it may be easier to implement an arbitrage strategy (in terms of transaction costs, liquidity, assets management’s capacity, etc) but why do we observe stronger LABR interaction with TAG term in the more recent subsample period? This seems to be rather odd.

- The reference list is too long
  - It seems to reach for everybody
  - But some of them are not really relevant and some relevant citations are currently missing