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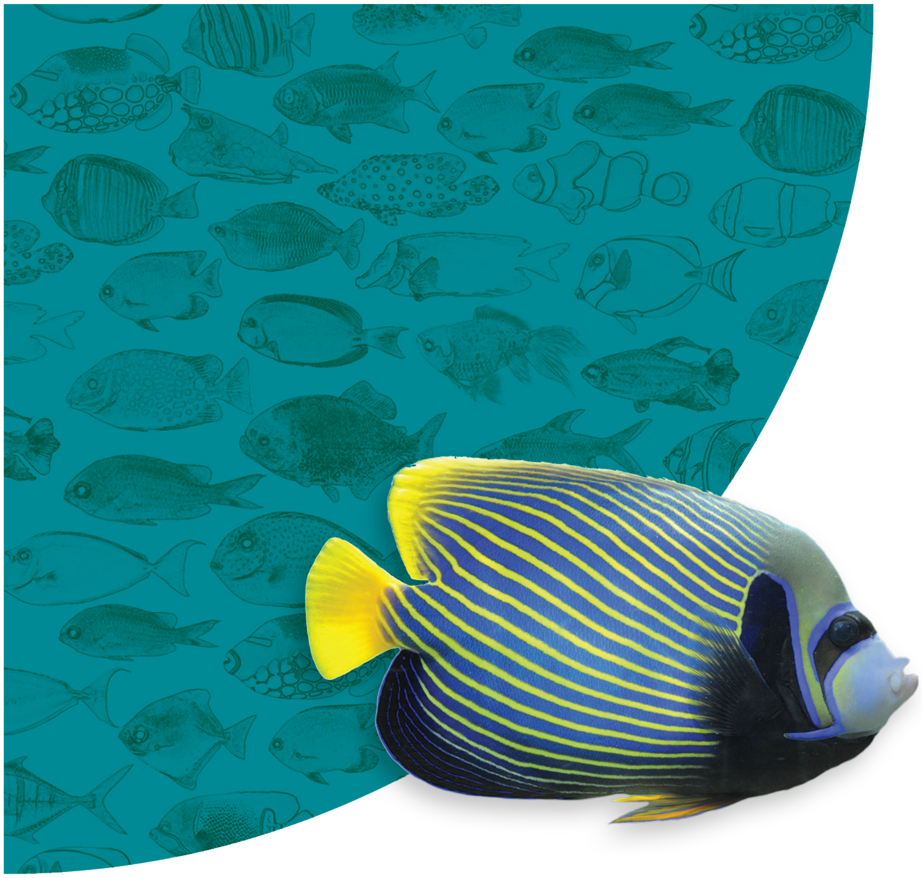

THE STATE OF THE IPO MARKET

What Makes For a Good Investment
A Whitepaper on IPOs since 2012

Our leadership in microcap investing
is reinforced by a commitment to research and education

2016
Small is passionate.

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THE STATE OF THE IPO MARKET

What Makes for a Good IPO Investment?
A Whitepaper on IPOs since 2012

Investors continually debate the value of initial public offerings, or IPOs. On the one hand, investors see the soaring initial returns for a company after its IPO, and want to know how to think about investing in such a stock, and perhaps how to invest in the opportunity. On the other hand, many IPOs "break", or fall below the initial offering price, at some point sooner or later after the IPO date, and investors then regret jumping into the stock.

- Is an IPO a chance to invest on the ground floor of a potential winner, or a trap for investors that benefits only the founders and their bankers?
- Is a broken IPO a failed investment, or a hidden opportunity?

We set forth to understand the factors these days that drive performance of stocks after an IPO. We want to know what drives value, what causes an IPO to break, and how smart investors can take advantage of IPOs for individual portfolios.

Many other scholars and analysts have researched IPOs over the decades. One of the most cited efforts, studying IPOs from 1975-1984, affirms that IPOs perform well in their first few days or weeks, followed by as many as three years of underperformance.[1] A similar analysis affirms this conclusion, with the additional finding that the timing, both for the IPO and for the period analyzed, can affect the results.[2]

We applied the approach from this research to more recent IPOs, to see what we can learn about the environment in the past few years.

- Performance of an individual IPO depends mostly on valuation of the shares at the time of the IPO. Not surprisingly, companies with higher valuations tend to decline in value sooner or later after an IPO, while companies with more moderate valuations improved.
- IPOs are more "popular" in some instances than in others. By this we mean the timing (year) of the IPO and the industry sector also influence performance. IPO pricing and valuation was higher in some years and for some industry sectors than in others. In this analysis, IPOs from 2012 and 2013 performed better than ones from 2014 and 2015. IPOs in biotechnology performed worse than those in other industry sectors.
- A relatively smaller number of IPOs have outperformed the rest significantly. An astute investor can find suitable IPOs for investment, if he or she has the discipline to invest at reasonable valuations, and the patience to allow IPO companies to reach that valuation.

[1] Ritter, Jay R., "The Long-Run Performance of Initial Public Offerings", The Journal of Finance, Vol. XLVI, No. 1 (March 1991), p. 3-28

[2] Ritter, Jay R. and Ivo Welch, "A Review of IPO Activity, Pricing, and Allocations," The Journal of Finance, Vol LVII, No. 4 (August 2002), p. 1795-1828

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Over 700 IPOs

We assembled a data set of all U.S. IPOs from 2012 to the present. This data includes 721 individual companies that undertook an IPO from January 1, 2012 to March 31, 2016 (Table 1).

TABLE 1: SUMMARY DATA

Sample Size	721
Avg. Market Cap at IPO ($millions)	1,552
Avg. Aggregate Nominal Return From IPO Price	8.7%
Avg. TEV/Rev at IPO	17.4
Avg. Current TEV/Rev (a/o 3/31/16)	9.6
Median Aggregate Nominal Return from IPO Price	-7.7
Median TEV/Rev at IPO	5.8
Median Current TEV/Rev (a/o 3/31/16)	2.3

These companies varied considerably in size. The smallest were under $10 million in market capitalization at the time of the IPO. The largest were in the tens of billions of dollars, including Facebook (NasdaqGS:FB) at $82 billion in 2012 and Alibaba Group (NYSE:BABA) at $231 billion in 2014. The average market capitalization for all IPOs in the data set was $1.54 billion at the time of IPO.

We immediately see some interesting results for these companies.

Overall, negative returns: The median share price return was -7.7% since the IPO date. Yet, the average share price return was 8.7%, suggesting that a small number of very strong performers dominate IPO performance. (Note the return statistics presented represent total share price change since IPO, and are not annualized or adjusted for performance compared to a benchmark.)

Valuation declines: Valuation, expressed as the ratio of total enterprise value to trailing annual revenues, declined significantly since the IPO date. Yet, some companies dominate the valuation. As of the IPO date, the median valuation was 5.8. As of today, the median valuation declined to 2.3, less than half of the valuation on the IPO date. Similar to returns, a small number of IPOs outperformed the others.

The *average* valuation as of the IPO date was 17.4, reflecting very high valuations for a small number of companies. This average valuation declined to 9.6 as of March 31, 2016.

Larger Companies Performed Better

We analyzed IPO performance relative to company size. We divided the data set into four market capitalization groups (Chart 2).

TABLE 2: IPOs FROM 1/1/2012-12/31/15 BY MARKET CAPITALIZATION

Market Cap ($millions)	Number of Companies	Average Market Cap at IPO ($ millions)
Under 150	210	57
150-500	191	313
500-3000	257	1,173
Over 3,000	68	10,986

Source: Capital IQ.

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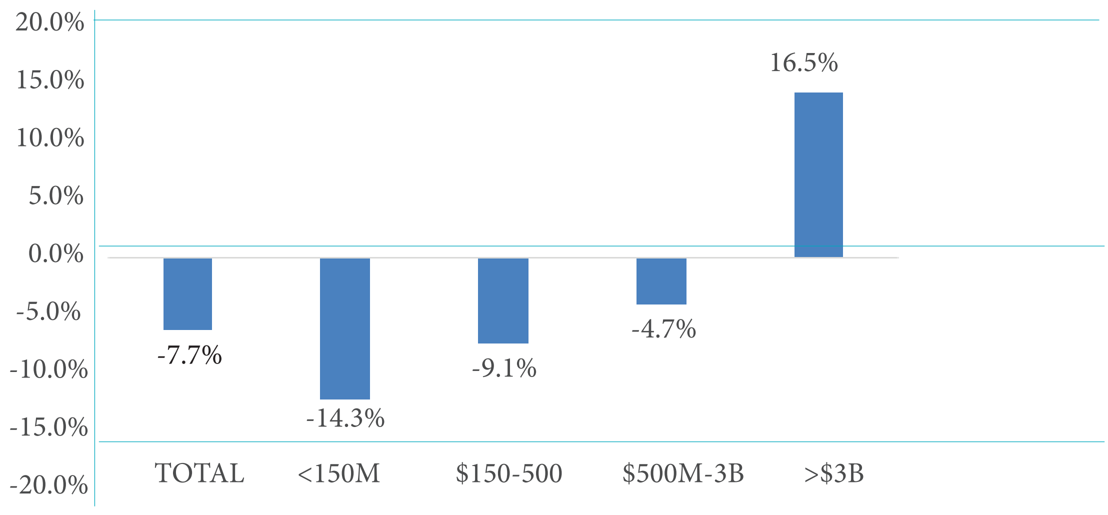
Among these groups, the largest companies performed better than small ones (Chart 1).

CHART 1: MEDIAN RETURN OF IPOs FROM 1/1/2012-12/31/2015
SINCE IPO DATE BY MARKET CAPITALIZATION AT IPO



Source: Capital IQ.

Small-cap value investors should find this result encouraging. It suggests a large number of companies that went public since 2012 could represent an attractive investment.

Smaller Company IPOs Broken More

IPOs that “break” trade below the initial offering price. They can do this at any point after the IPO date. Broken IPOs may offer an attractive investment opportunity:

- On the one hand, an IPO with a current price below the IPO price may offer the potential returns that first-day investors sought, but at a reasonable price.
- On the other hand, a broken IPO may break for a good reason, namely first-day investors mispriced it, and jumped into an opportunity that was likely to deliver suitable value.

For purposes of this analysis, if an IPO trades below the IPO price as of the date of this analysis (January 2016), then it is considered broken, without regard to the date of IPO.

Within the data set, more IPOs were broken (421) than unbroken (300) (Table 3). The market capitalization of the broken IPOs was considerably smaller, at an average of $921 million, compared to $1.56 billion for unbroken IPOs.

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TABLE 3: BROKEN AND UNBROKEN IPOs FROM 1/1/2012-12/31/2015 BY MARKET CAPITALIZATION AT IPO

	Broken IPOs		Unbroken IPOs	
Market Cap ($millions)	Number of Companies	Average Market Cap at IPO ($ millions)	Number of Companies	Average Market Cap at IPO ($ millions)
Under 150	140	62	69	46
150-500	112	314	76	313
500-3000	138	1,146	118	1,210
Over 3,000	31	5,983	37	15,178
	421	921	300	1,566

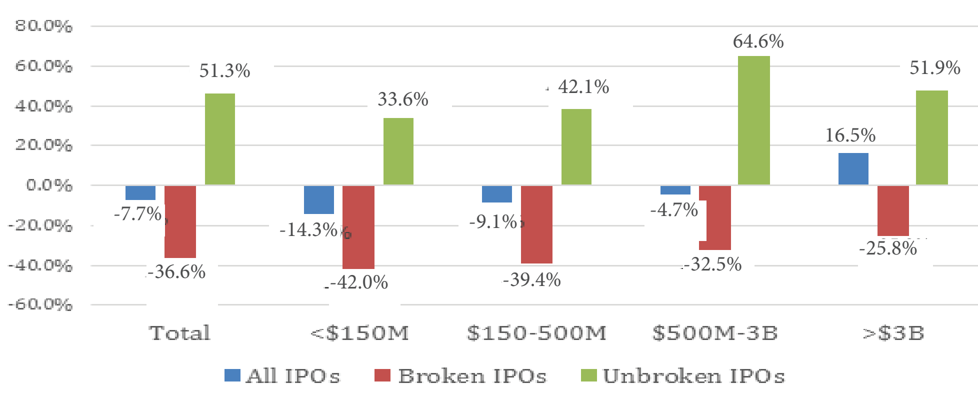
Source: Capital IQ.

Similarly, smaller companies were more likely to lead to a broken IPO. Among the largest companies, with a market capitalization at IPO of over $3 billion, more IPOs were unbroken (37) than broken (31).

Among companies in all of the other market capitalization groups, more IPOs were broken than unbroken. This is most pronounced in the smallest market capitalization group, under $150 million, in which 67% of the IPOs were broken. In the other market capitalization groups, between $150 million and $3 billion, about 55% of the IPOs were broken.

Smaller companies not only had broken IPOs more often, they also broke “harder”. Overall, unbroken IPOs experienced a median return of 51.3%, compared to a median return of -36.6% for broken IPOs (Chart 2). This of course makes sense, as broken IPOs have a negative return as of the date of the analysis.

CHART 2: MEDIAN RETURN OF IPOs FROM 1/1/2012-12/31/2015 SINCE IPO DATE BY MARKET CAPITALIZATION AND STATUS



Source: Capital IQ.

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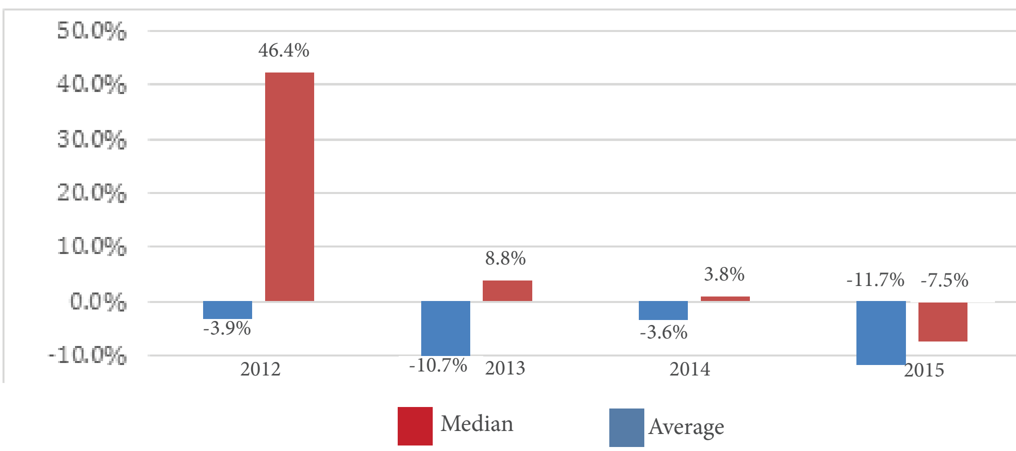
These returns vary by market capitalization of the company. The smallest companies, under $150 million in market capitalization, saw returns of -42.0%, compared to -25.8% for the largest companies (over $3 billion).

IPO Timing Influences Performance

By timing, in this analysis we mean the calendar year of the IPO. This view suggests that in some years, IPOs are higher- or lower-quality than in other years. Companies and their bankers may bring some IPOs to investors based on the environment for IPOs, rather than on the inherent value of the IPO.

IPOs from 2012 have generally performed best. While the median return was slightly negative, the average was very high, with a small number of outstanding performers (Chart 3).

CHART 3: RETURN OF IPOs FROM 1/1/2012-12/31/2015
SINCE IPO DATE BY IPO YEAR



Source: Capital IQ.

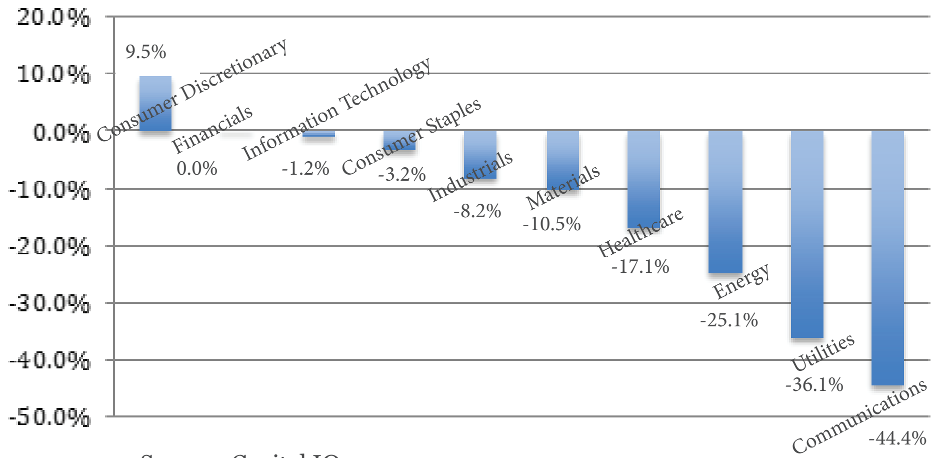
In contrast, IPOs from 2015 performed much worse than those in the other years represented in the data set.

IPO Performance Varies by Industry Segment

Among the various industry segments represented, healthcare dominates the data set with 231 IPOs, financial services (157 IPOs) and information technology (114 IPOs) also account for a significant number of companies. About three-fourths of these IPOs are biotechnology or pharmaceutical companies, with the most speculative technology. These healthcare IPOs performed worse than any other segment with meaningful representation in the data set, other than energy (Chart 4).

Past performance does not guarantee future results.

CHART 4: RETURNS BY INDUSTRY SEGMENT FOR IPOs FROM 1/1/2012-12/31/2015



Source: Capital IQ.

In this analysis, utilities and telecommunications services together include only 13 IPOs, about 2% of the total. The remaining segments, outside of healthcare and energy, delivered a median return that was only slightly negative, suggesting that the large number of healthcare IPOs drove much of the poor performance overall.

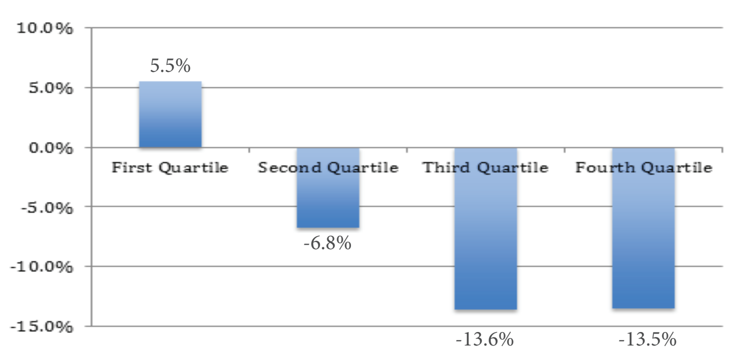
Valuation Drives IPO Performance

The final and most important dimension of performance is valuation at the time of the IPO. There are many ways to define value. For this analysis, we use the ratio of total enterprise value (TEV) to revenues.

Earlier, we saw that the median valuation for the entire data set at the time of IPO was 5.8 (See Table 1). The median has since declined substantially to 2.3. Within the data set we see significant variation in valuation along many of the other attributes we reviewed here.

The IPOs with the lowest valuation have performed best. Among all the IPOs, the ones in the first (lowest) quartile of valuation are the only companies with positive returns since the IPO date (Chart 5).

CHART 5: MEDIAN RETURN FOR IPOs FROM 1/1/2012-12/31/2015
SINCE IPO DATE BY VALUATION AT IPO DATE



Source: Capital IQ.

Half of the IPOs, (the third and fourth quartile of valuation) had a median return around -13%.

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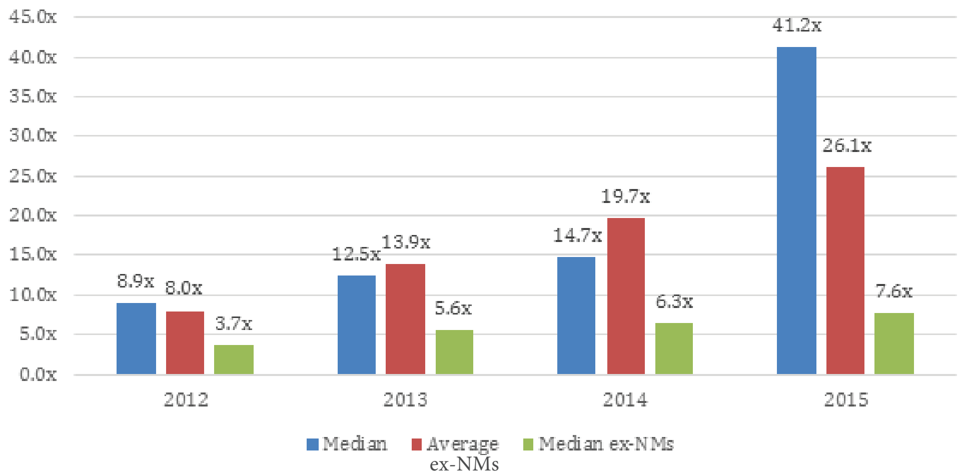
We also analyzed valuation by year. For this analysis, we removed companies with zero revenues, which we deem as non-meaningful. With these companies, the median valuation increased steadily from 2012-2014, and then dramatically in 2015 (Chart 6). Without these companies, median valuation increased substantially from 2012 to 2013, and then steadily from 2013-2015.

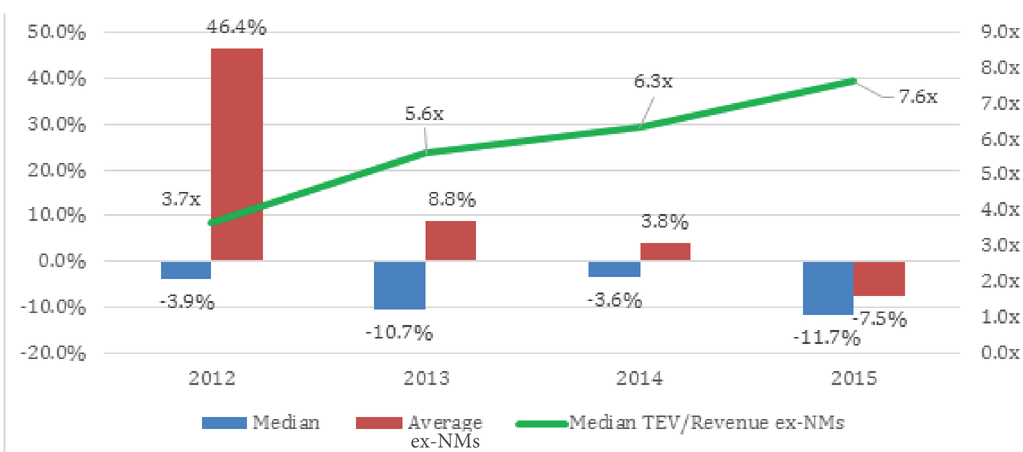
CHART 6: IPO VALUATION BY YEAR FOR IPOs FROM 1/1/2012-12/31/2015, ADJUSTING FOR NON-MEANINGFUL COMPANIES



Source: Capital IQ.

Finally, we compare valuation to return directly, by year. Based on this analysis (Chart 7), as valuation increased each year, median and average returns declined over time.

CHART 7: VALUATION AND RETURN BY YEAR, ADJUSTING FOR NON- MEANINGFUL COMPANIES



Source: Capital IQ.

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Conclusion: Investment in IPOs Can Work Well

With the proper approach and analysis, IPOs represent a sound investment. Looking at IPOs by market capitalization and industry segment helps to narrow and focus the decision about whether a given IPO makes sense.

Above all, we think it demands discipline about valuation and timing. That discipline distinguishes between an IPO that has reverted to a sensible valuation at the right time, and one that is unlikely to deliver any value over any foreseeable time frame.

Valuation: IPOs frequently begin at lofty valuations, and then soar higher. Even if they don't break below the IPO price, they may return to a more sensible valuation and thus become a more viable investment. When they do break below the IPO price, they often become even more attractive.

Timing: : As with much else in investing, timing is everything. An IPO that breaks too soon could represent a poorly-priced IPO, or a fundamentally poor investment.

At Perritt Capital Management, we apply this philosophy and process to all investments, and specifically to IPOs. We watch IPOs closely, with rigorous tracking databases and sophisticated metrics. As we have shown, we aim to avoid IPOs at launch, when other investors flock there, valuation soars, and the underlying business remains unproven. When valuation reaches appropriate levels, and we know more about cash flow and profitability, we make an educated decision about adding an IPO company to our portfolio.

Overall, IPO investing is like any other equity investing. It demands analysis and discipline, and close attention to valuation.

Aggregate Nominal Return is the number of shares issued multiplied by the share price March 31. 2016 divided by the IPO share price.

Average Total Enterprise Value/Revenue (Avg. TEV/REV) is the Total Enterprise Value (equity plus debt less cash) at time of IPO divided by most recent annual revenues.

Cash flow is the net amount of cash and cash equivalents moving into and out of a business.