

Strategic Advisory Analytics

The MTS US Biotech IPO Monitor

Edition 3: H1 2018 Update – Will 2018 Beat the 2014 High Tide Mark For Biotech IPOs?

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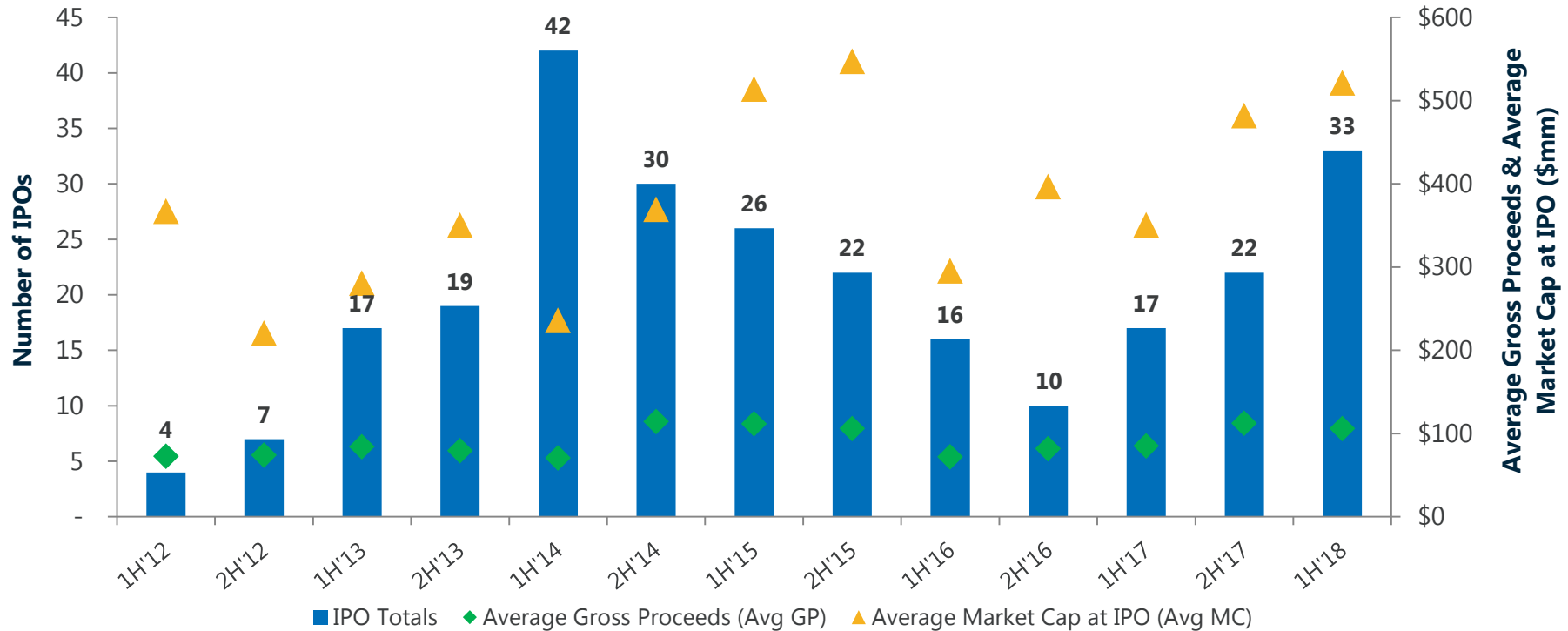
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2012 – H1:2018 IPO Biotech Market Overview

Detailed Analysis Looking at H1:H2 from 2012 to Today

Average Gross Proceeds and Average Market Cap at IPO by Year



	1H'12	2H'12	1H'13	2H'13	1H'14	2H'14	1H'15	2H'15	1H'16	2H'16	1H'17	2H'17	1H'18
IPO Totals	4	7	17	19	42	30	26	22	16	10	17	22	33
Total Gross Proceeds	\$290	\$517	\$1,429	\$1,504	\$2,957	\$3,426	\$2,901	\$2,326	\$1,150	\$817	\$1,446	\$2,464	\$3,491
Total Market Cap at IPO	1,467	1,544	4,769	6,652	9,902	11,080	13,361	12,034	4,723	3,964	5,958	10,604	17,205
Average Gross Proceeds	73	74	84	79	70	114	112	106	72	82	85	112	106
Average Market Cap at IPO	367	221	281	350	236	369	514	547	295	396	350	482	521

Note(s): All \$ in mm.

Source(s): MTS and Dealogic, as of 03/31/2018. Special thanks to "The Godfather" Stelios Papadopoulos for the historic data.

Executive Summary

The MTS Biotech IPO Monitor - Edition 3: H1 2018 Update – Will 2018 Beat The 2014 High Tide Mark For Biotech IPOs?

Key Messages From Detailed Analysis of 2012-H1:2018 IPOs

1. “Quality” Over Stage of Asset: Pre-Clinical/PI IPOs Have Higher Raises and Valuations than PIII Companies – Page 8
2. Gene Therapy Companies Continue to Garner Higher Raises and Valuations than Small Molecule Companies – Page 9
3. 85% of IPOs Are Still Trading As Original Entities; Exits: 9% M&A, 4% Reverse Merger, 2% Bankrupt or Delisted – Page 10
4. Foreign Issuers Have Broad Access to US Capital Markets - Higher Quality Companies Eventually Gravitate to US listings – Page 11
5. ~30% Insider Participation Continues to be an Important Factor for a Successful IPO – Page 12

US Biotech IPO Market H1:2018

- > **A strong H1:2018 on number and initial IPO valuations...**
 - H1:18 was a strong first half in terms of the number of IPOs; 33 in H1:18, vs. 17 in H1:17, 16 in H1:16, 26 in H1:15, but lower than the banner 42 in H1:14
 - H1:18 average raise/post money valuation was stronger than full previous years at \$106/\$521m vs. FY17 \$100m/\$425m, FY16 \$76m/\$334m, FY14 \$89m/\$291m, but lower than the FY15 \$109m/\$529m
- > **...with a scattered performance**
 - 19 out of the 33 H1:18 IPOs have posted gains at an impressive average of +49%; The 14 underperformers have an average loss of -23%
 - Mean IPO to current performance for class of H1:18 +19% vs. class of 2017 +67%, class of 2016 +80%, and class of 2015 +20%

MTS Bespoke IPO Database

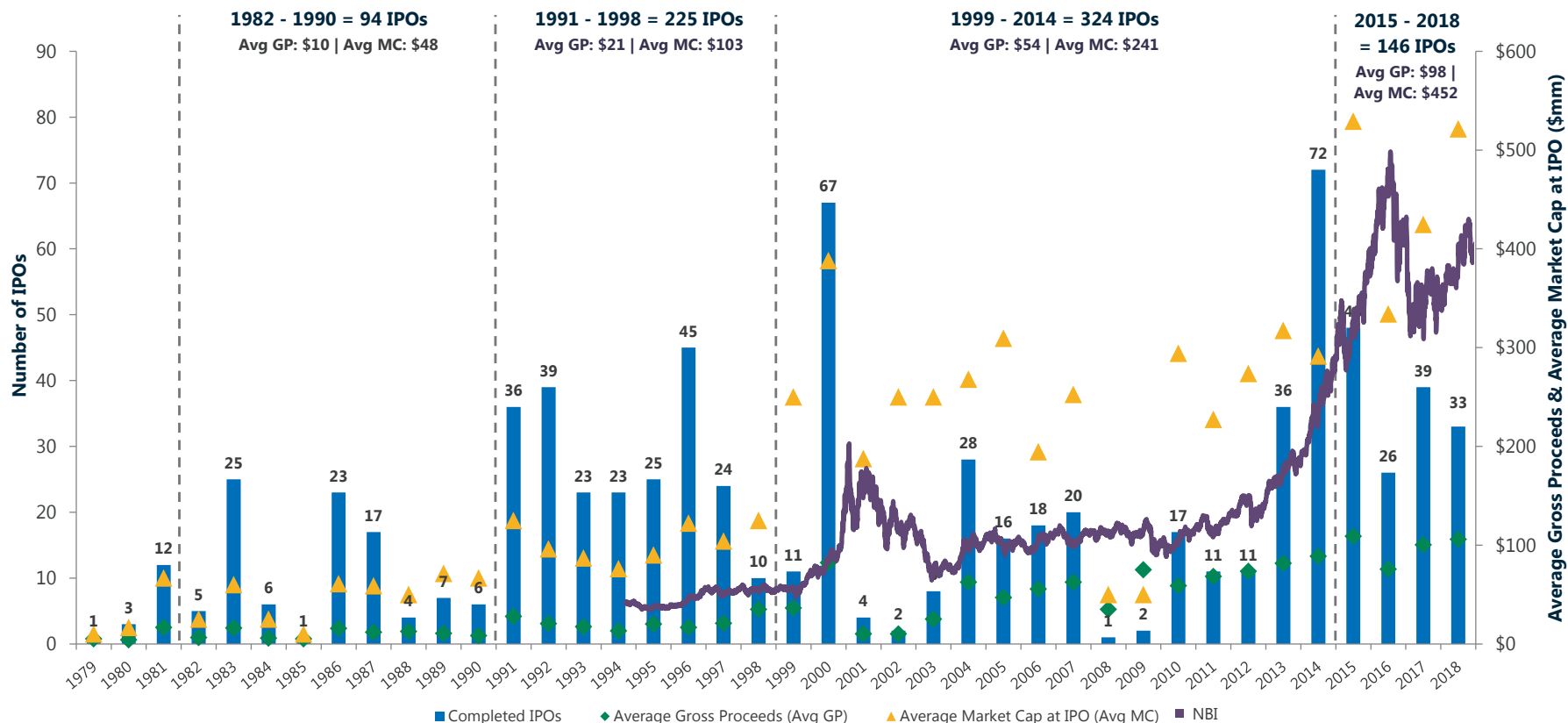
- > MTS’ “Strategic Advisory Analytics” reports exemplify our value-add strategic advisory services to clients across all healthcare industry sub-sectors
- > Within the “US Biotech IPO Monitor” series, we utilize our proprietary database to generate thought-provoking statistics/observations about the IPO market
- > Our database includes the 805 US Biotech IPOs from the first 1979 US Biotech IPO with micro detailed analysis from 2012

2018 Shaping to be the Best for this Industry

- > **Gene Therapy and foreign issuers continue to be red hot**
 - The number of potential IPO candidates in the pike continues to pressure the time capacity issue to vet companies from the buy-side
 - The total post money valuation hit an all time high at \$17.2Bn in H1:18 (partly bolstered by the Morphosys ADR listing)
 - The strong momentum in Gene Therapy companies continued in H1:18 with 8 IPO companies or 24% of all H1:18 IPO’s. Post Money valuations for these Gene Therapy companies at a high at \$510m
 - Four foreign issuers accessed the US markets, which compares to 7 in FY 2017 and 2 in FY2016

The 40 Years Of US Biotech IPOs

There Have Been 4 Era's of Biotech IPO Valuations – With Average Gross Proceeds and Market Capitalizations Roughly Doubling In Each Subsequent Period



Special thanks to Stelios “The Godfather” Papadopoulos for the historic data

MTS' Strategic Advisory Analytics Reports

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Industry Thought Reports

Drug pricing

[Principled Drug Pricing Centered on Innovation and Choice: Part 1](#)

[Will Drug Pricing Still be as Big of an Issue Going Forward with the New US Administration?](#)

[Unprincipled Price Rises: Where is the Value in the Unbearable Symptom?](#)

[The Frictional Cost Break-up in Drug Pricing: It's not Me, It's You](#)

[Orphan Drug Pricing – Unlikely to be Left Alone in the Current Pricing Debate](#)

[#complex drug pricing in 140 characters or less](#)

Gene Therapy: Near-term Revolution or Continued Evolution?

[Part 1: Global Proprietary Data](#)

[Part 2: The Gene Therapy Ecosystem](#)

Industry Dynamic Comments

IPO Monitor

[The MTS US Biotech IPO Monitor: 2017 Was a Banner Year – How Does This Bode For 2018, The 40th Birthday For The US Biotech IPO Market?](#)

Therapeutic Area Thought Reports

Dermatology – anticipated Q3:2018

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- 6. Introduction to MTS**

Appendix



1. Executive Summary

Key Message 1: “Quality” Wins Over Stage of Asset

Big Idea/Pre-Clinical/PI Companies Have HIGHER Raises and Valuations Than PII/PIII Companies

Key Observations from Lead Asset Analysis by Stage

- > A detailed analysis of the 265 IPOs from 2012-H1:2018 when considering the stage of the lead asset (broken down into three buckets; early-stage – preclinical/Phase I; mid-stage - Phase II; late-stage - Phase III/filed/marketed) demonstrated that, broadly speaking, the ability to raise capital and concomitant valuation remains dependent on the quality of the company rather than the stage of the lead asset
- > In H1:2018, companies (n=33) with early-stage assets garnered the 2nd highest average, and for the 2012-H1:2018 time frame remained at the top
- > It is important to note that Morphosys, the largest biotech IPO in a decade, with Phase III asset drove late-stage companies average raise and average PM in H1:18
- > Data summarized from pages 19, 65, 66

	Early-Stage (27%)	Mid-Stage (40%)	Late-Stage (32%)
Avg Raise (2012 - H1 2018)	\$97	\$92	\$91
Avg PM (2012 - H1 2018)	420	357	406
	Early-Stage (18%)	Mid-Stage (38%)	Late-Stage (44%)
Avg Raise (2017)	\$96	\$98	\$104
Avg PM (2017)	453	369	462
	Early-Stage (42%)	Mid-Stage (33%)	Late-Stage (24%)
Avg Raise (H1 2018)	\$107	\$100	\$113
Avg PM (H1 2018)	475	432	726

Two Key Interlinked Dynamics:

1. Quality of the company acts as an investor filter relative to the development stage of the company: “hot” early-stage companies can get out at high valuations relative to “standard” late-stage companies – the classical “risk/reward” play
2. The healthcare specialist investor base for each bucket of stage of lead asset company is notably different – but rapidly changing (new gen “Crossover”)

Key Message 2: Gene Therapy = Highest Raises & Valuations

Gene Therapy Companies Garner ~50% Higher Raises and Valuations Than Small Molecule Companies

Key Observations from Lead Asset Analysis by Modality

- > A detailed analysis of the IPO market from 2012-H1:2018, when considering the modality of lead asset [broken down into four buckets; small molecule, biologic, Gene Therapy (GT) or other], demonstrated that GT modality commands highest raises and concomitant valuations
- > In H1:2018, there were 8 GT companies: Unum Therapeutics, Homology Medicines, Solid Biosciences, MeiraGTx, AVROBIO, Translate Bio, Magenta Therapeutics and Autolus Therapeutics
- > In Q1:2018, there were 3 GT companies, Unum Therapeutics, Homology Medicines and Solid Biosciences. Interestingly, two out of three companies are clinical stage companies that both underperformed post IPO around clinical/FDA news flow, but have recovered in Q2:2018
- > Data summarized from pages 20, 67, 68

	Small Molecule (49%)	Biologic (27%)	Gene Therapy (18%)	Other (6%)
Avg Raise (2012 - H1 2018)	\$85	\$92	\$121	\$82
Avg PM (2012 - H1 2018)	315	466	472	404
	Small Molecule (51%)	Biologic (31%)	Gene Therapy (10%)	Other (8%)
Avg Raise (2017)	\$104	\$106	\$93	\$63
Avg PM (2017)	451	471	282	253
	Small Molecule (39%)	Biologic (24%)	Gene Therapy (24%)	Other (12%)
Avg Raise (H1 2018)	\$102	\$124	\$118	\$57
Avg PM (H1 2018)	417	834	510	256

A Focus on GT Remains

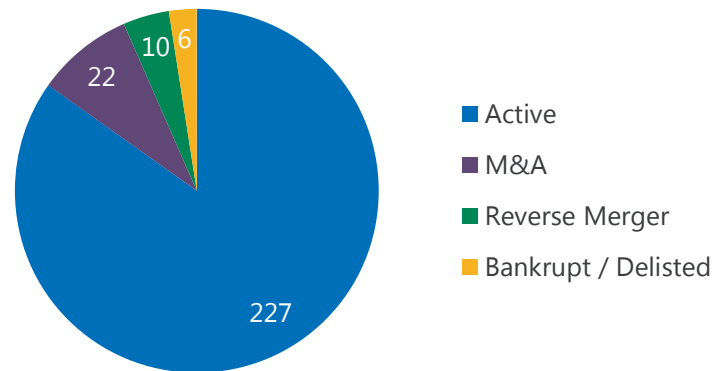
As noted above, the GT sector IPO window remains open with relatively robust valuation despite companies the regulatory clinical noise. This somewhat reflects the M&A within the GT space over the last 9 months

Key Message 3: 85% IPOs Still Trading As Original Entities

A Relatively Small Proportion of IPOs Exit Via M&A or “Completely Fail”

Key Observations from Different Types of Exits

- > Of 265 companies that IPO'd from 2012 – H1:2018, 22 companies exited via M&A at an average 299% premium to IPO pricing
 - H1:18 saw a very strong M&A dataflow with 5 deals, less than the number in the whole of 2017 and 2 more than in 2016
 - In H1:18, the average premium was 404%, only second to 2015's outstanding year when average premium was 520%
 - In H1:18, the average time to exit was 1.4 years vs. 2.0 years for all companies in 2012-2016
- > From the same 265 companies, 10 companies reported negative data and reverse merged at an average of a 73% discount to IPO pricing
 - 2017 was “The Reverse Merger Year” from 2012 – H1 2018, 6 of the 10 reverse mergers occurred in 2017, 2 occurred in H1:2018
 - The majority of private companies that were the effective acquirers in these reverse mergers were considering a traditional IPO
- > Of 265 companies, there were 6 that filed for bankruptcy or delisted
- > Data summarized from pages 21, 22



IPO Exits via M&A and Reverse Mergers – Somewhat Surprising Results

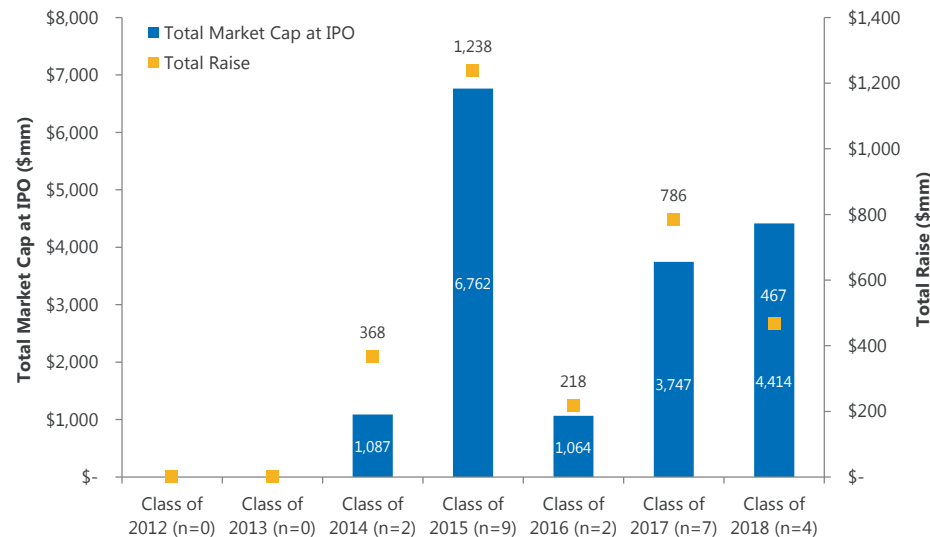
Of the 265 US Biotech IPOs over the last 7 years, 22 (8.3%) were acquired, 10 (3.8%) had lead asset failures and exited via a reverse merger, and 6 (2.3%) filed for bankruptcy.

Key Message 4: Foreign Issuers Have Broad Access to US

Generally Higher Quality/Successful EU Companies Eventually Gravitare to US listings

Key Observations from ADR Offerings

- > Over the last 7 years, 2015 and 2017 were exceptional years for foreign issuers IPOing in the US based on matrices such as total amount raised and post money valuation
- > In 2015, there were 9 foreign companies that IPO'd, raising ~22% of the total amount raised and representing ~25% of total post money valuation for that year, whereas in 2017 there were 7 foreign companies that IPO'd, raising ~20% of total IPO proceeds and representing ~22% of total post money valuation for the year
- > In H1:2018 there were 4 foreign company raising ~13% of total IPO raise, and representing ~25% of total post money valuation for the year to date



Foreign Companies Benefit from US Capital Markets

US capital markets offer the largest pool of sophisticated investors that are supportive of novel biotech technologies.

Key Message 5: Insider Participation, A Notable Component

High Insider Participation Continues to Drive Successful IPO Numbers in H1:2018

Key Observations from Analysis of Insider Participation

- > Over the last 7 years, average insider participation in the US biotech ranged from 23% - 40%
- > 2016 was a banner year with an average insider participation of 39.9%
- > H1:2018 numbers regarding the amount of insider participation demonstrate that the trend is continuing from previous years

	2012	2013	2014	2015	2016	2017	H1 2018	Total
Average Insider Participation	35.8%	29.2%	26.9%	22.1%	39.9%	32.0%	32.4%	29.5%

Meaningful Insider Participation in H1:2018 Continues to be a Driver in Successful IPOs

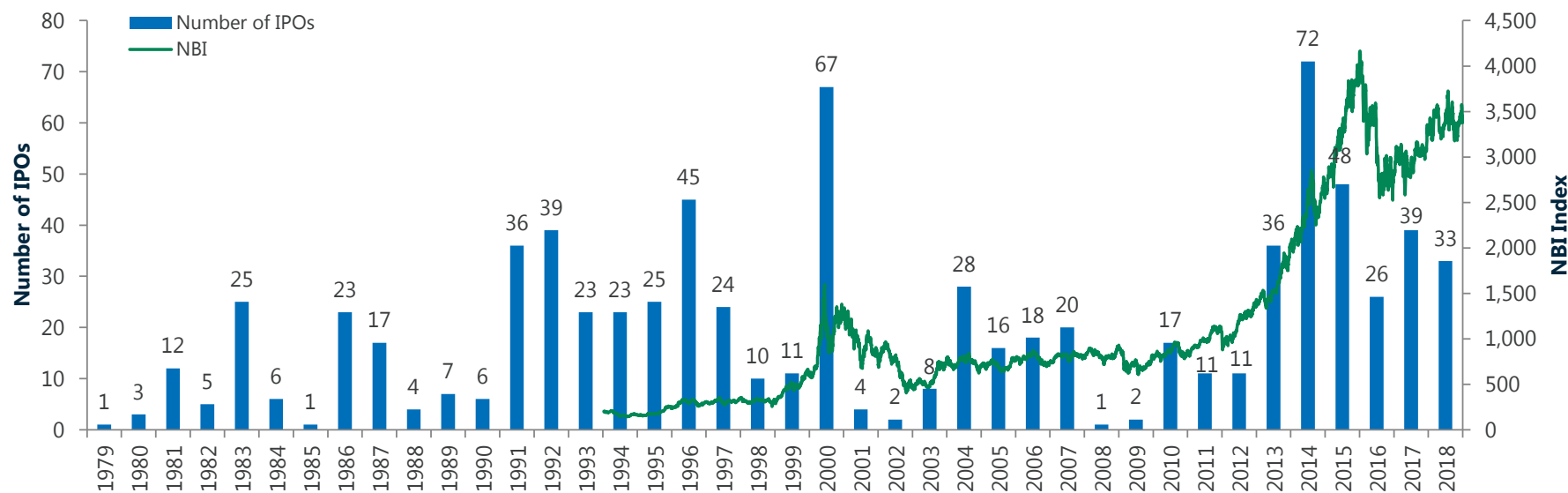


2. Historical Biotech IPO Market Overview

1979-2018 IPO Biotech Market Overview

2018 is the 40th Year of Public US Biotech

IPO Totals by Year vs. NASDAQ Biotech Index



Historical IPO Raises and Valuation

	2010	2011	2012	2013	2014	2015	2016	2017	H1 2018
Avg. Raise	\$80	\$75	\$73	\$81	\$89	\$109	\$76	\$100	\$106
Avg. Post Money Valuation	308	237	274	317	291	529	334	425	521
Total Raised	1,448	980	808	2,933	6,384	5,227	1,967	3,911	3,491
Total Post Money Valuation	5,538	3,075	3,011	11,421	20,983	25,396	8,688	16,563	17,205

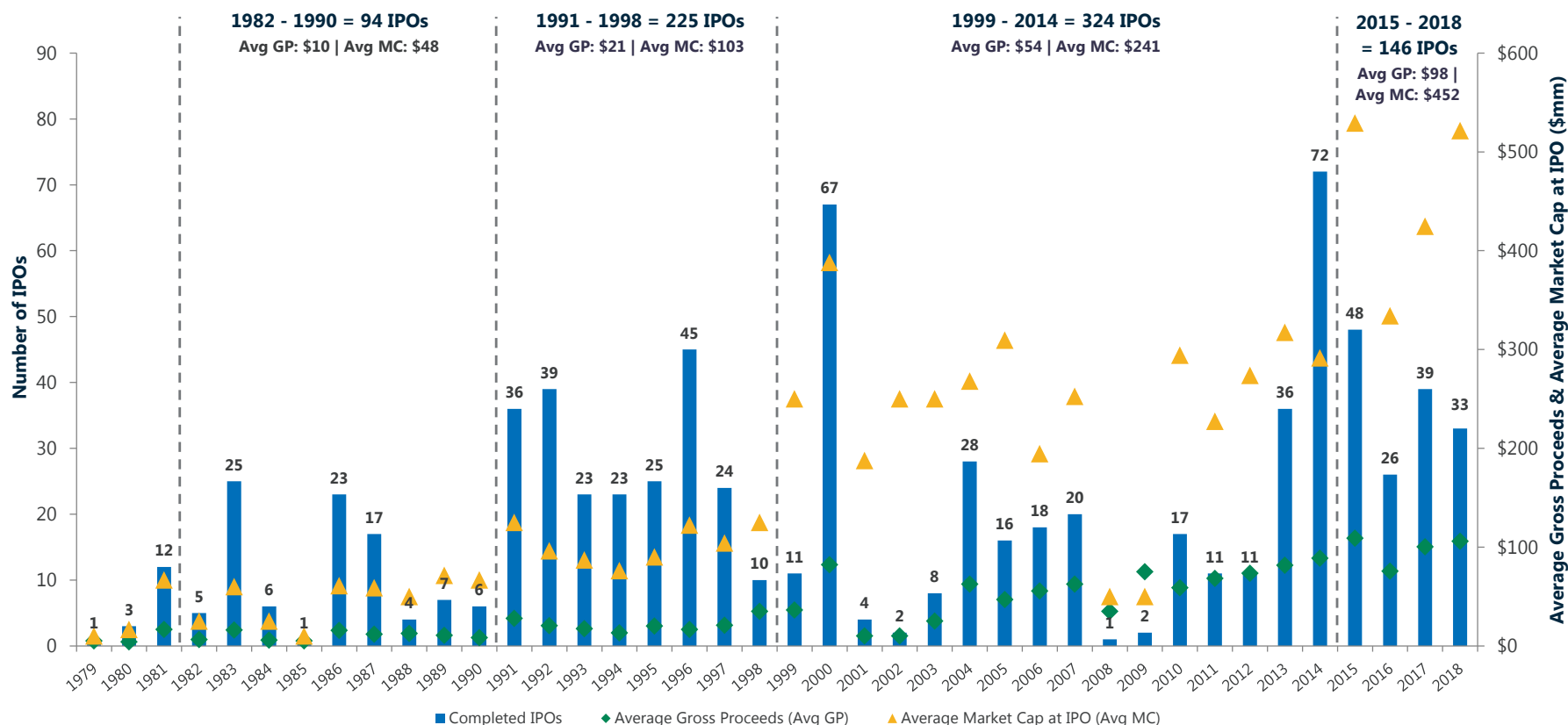
Note(s): All \$ in mm.

Source(s): MTS and Dealogic, as of 06/30/2018. Special thanks to "The Godfather" Stelios Papadopoulos for the historic data.

1979-2018 IPO Biotech Market Overview

The Three Generations Of US Biotech IPOs By Average Gross Proceeds and Market Cap

Average Gross Proceeds and Average Market Cap at IPO by Year

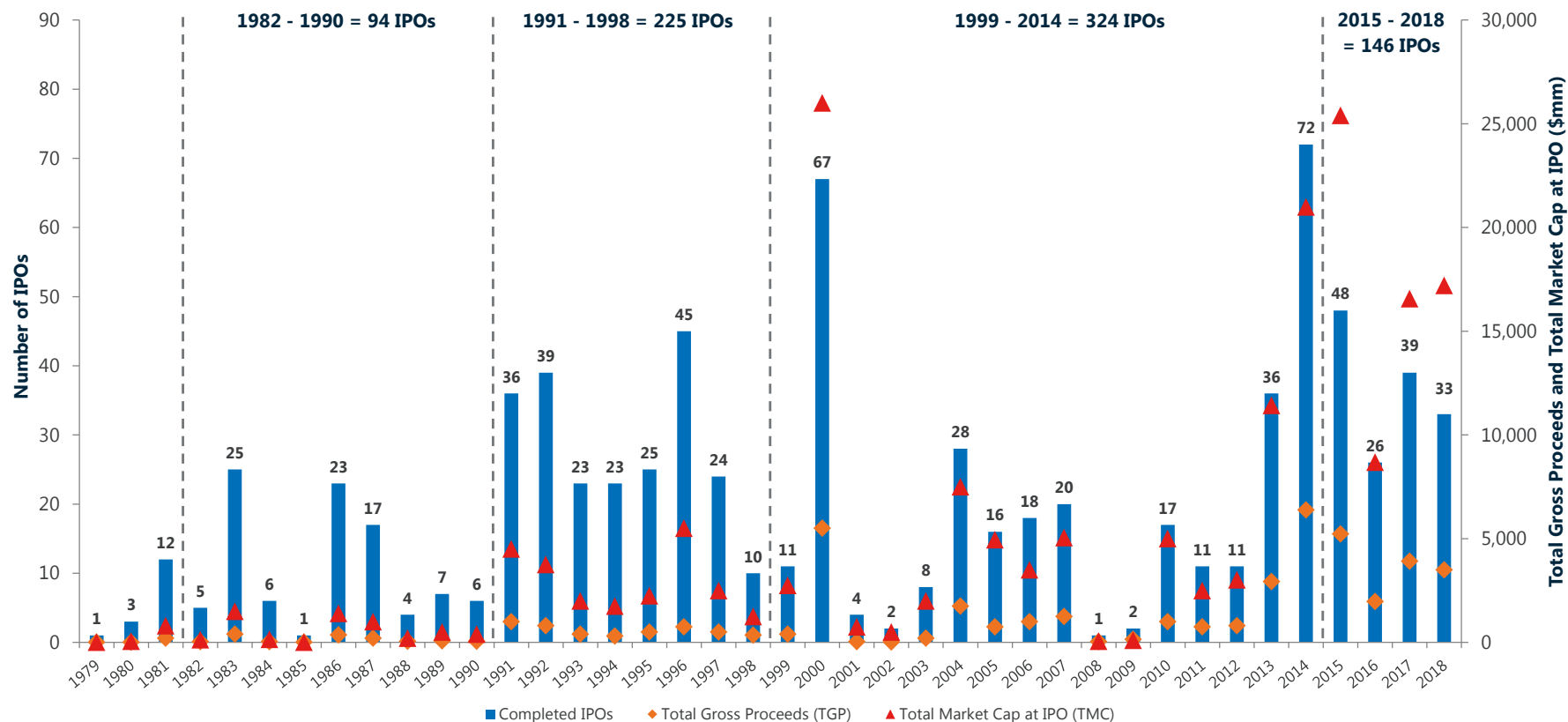


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1979-2018 IPO Biotech Market Overview

The Three Generations Of US Biotech IPOs By Total Gross Proceeds and Market Cap

Total Gross Proceeds and Total Market Cap at IPO by Year



Source(s): MTS and Dealogic, as of 06/30/2018. Special thanks to "The Godfather" Stelios Papadopoulos for the historic data.

Annual Stock Price Performance

Selected Benchmark Indices / Equities

	2010	2011	2012	2013	2014	2015	2016	2017	2018
NASDAQ	16.9%	(1.8%)	15.9%	38.3%	13.4%	5.7%	7.5%	28.2%	8.7%
Healthcare Indices									
NASDAQ Biotechnology Index	15.0%	11.8%	31.9%	65.6%	34.1%	11.4%	(21.7%)	21.1%	3.9%
NYSE Arca Biotechnology Index	37.7%	(15.9%)	41.7%	50.6%	47.6%	10.9%	(19.4%)	37.3%	14.0%
ProShares Ultra NASDAQ Biotechnology ETF	-	15.6%	66.8%	159.6%	66.8%	13.9%	(44.2%)	40.5%	3.7%
S&P Pharmaceuticals Select Industry Index	21.4%	11.6%	10.1%	59.5%	28.7%	1.1%	(23.7%)	11.3%	(0.8%)
Bellwether Stocks⁽¹⁾									
Mean	3.1%	27.4%	41.3%	86.4%	30.4%	2.5%	(11.5%)	9.3%	(5.8%)

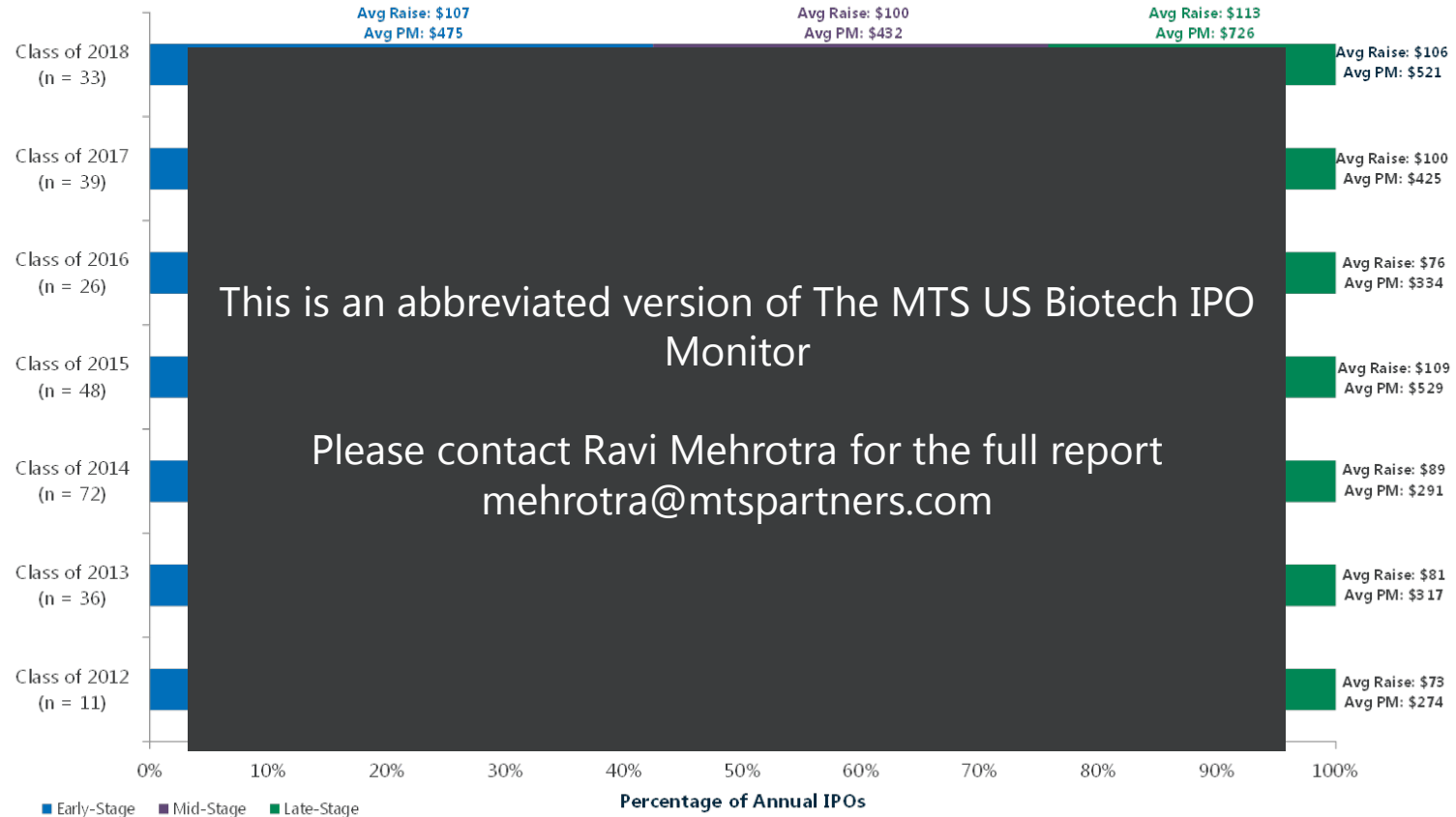
(1) Bellwether stocks comprise of AMGN, BIIB, CELG and GILD
Source(s): MTS and FactSet Research Systems, as of 06/30/2018.



3. 2012-H1:18 Detailed US IPO Biotech Analysis

Valuation Dynamics Split by Lead Asset Phase at IPO

Classes of 2012 – H1 2018

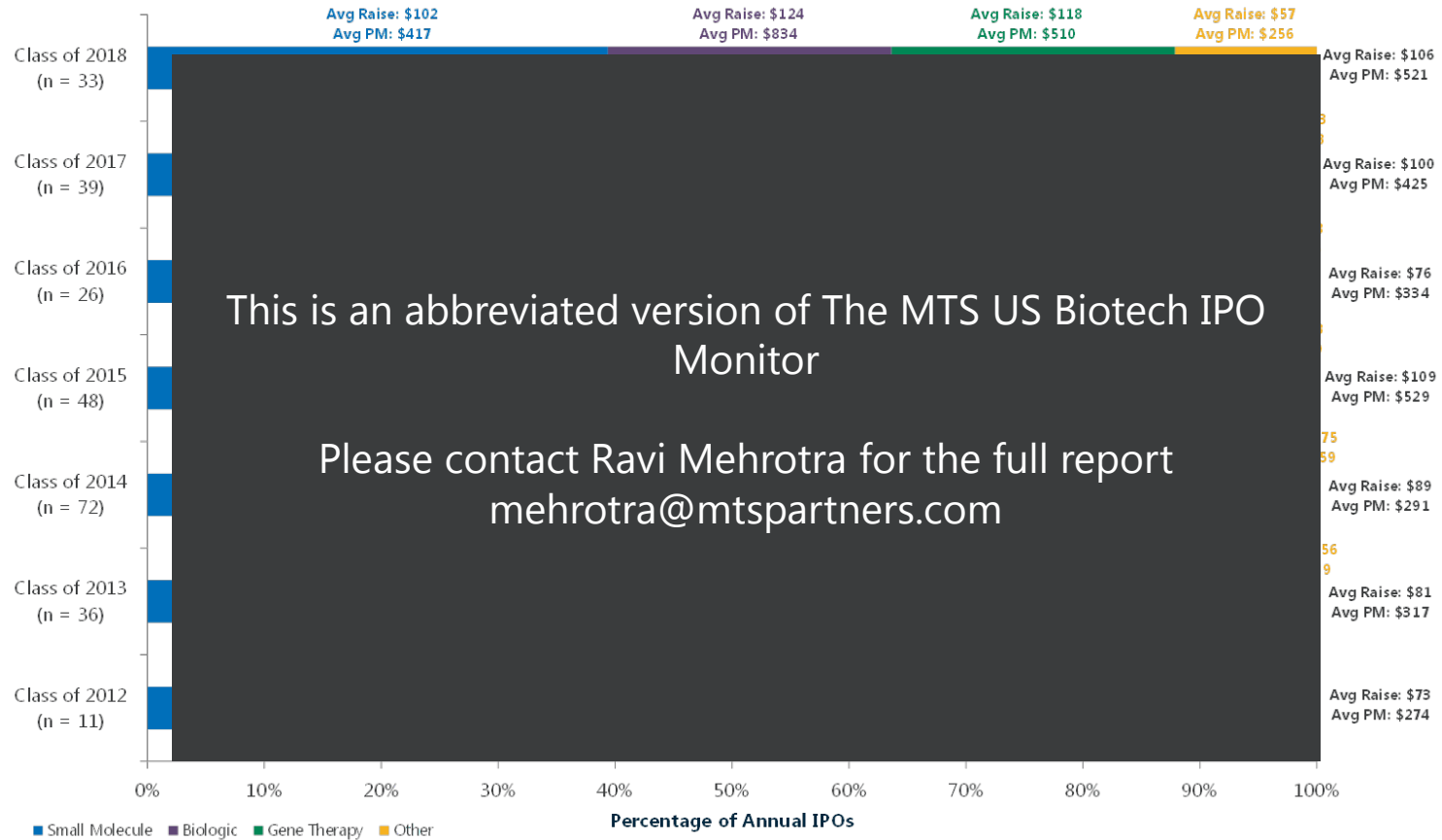


	Early-Stage (27%)	Mid-Stage (40%)	Late-Stage (32%)
Avg Raise (2012 - H1 2018)	\$97	\$92	\$91
Avg PM (2012 - H1 2018)	420	357	406

Note(s): All \$ in mm; Early-Stage = Preclinical and Phase I assets; Mid-Stage = Phase II assets; Late-Stage = Phase III assets and onwards. PM refers to post-money valuations.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Valuation Dynamics Split by Modality

Classes of 2012 – H1 2018



	Small Molecule (49%)	Biologic (27%)	Gene Therapy (18%)	Other (6%)
Avg Raise (2012 - 1H 2018)	\$85	\$92	\$121	\$82
Avg PM (2012 - 1H 2018)	315	466	472	404

Note(s): All \$ in mm; Other is comprised of steroids, vaccines and non-traditional biotech products.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Valuation Dynamics of IPO Exits via M&A

Classes of 2012 – YTD 2018 IPO Exits

	U.S. IPO Pricing Date	Exit Date	Time to Exit (Years)	Acquiror	Premium (Discount) to IPO Pricing
M&A	<p>Please contact Ravi Mehrotra for the full report mehrotra@mtspartners.com</p>				

(1) Traded on the NASDAQ as ADRs.

(2) Excluded from average, since stock was trading far below IPO price when acquired. For reference, the acquisition represented a 400% premium over unaffected stock price at the time.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Total: 22

Average: 299%

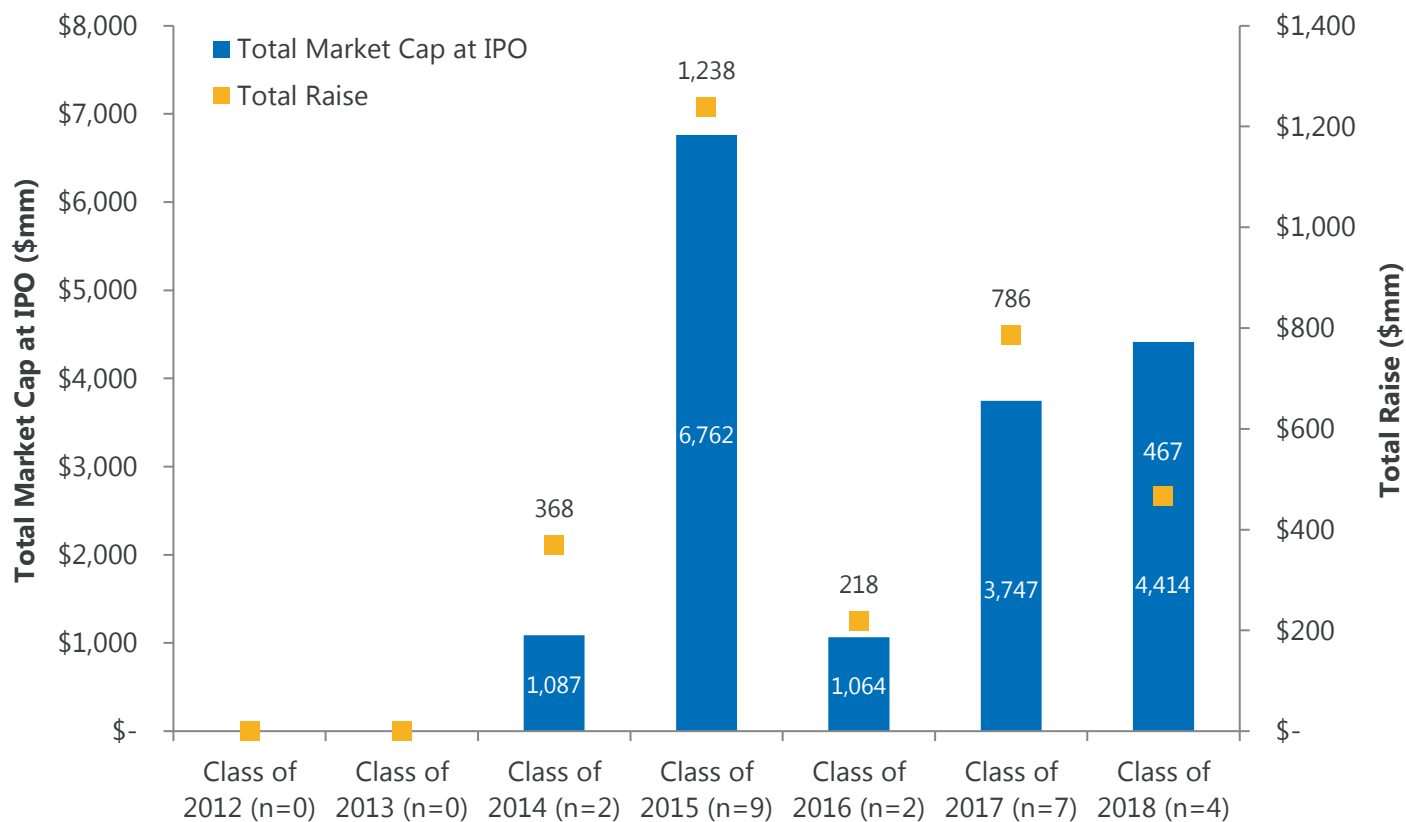
Valuation Dynamics of IPO Exits via Reverse Mergers & Bankruptcies

Classes of 2012 – YTD 2018 IPO Exits

	U.S. IPO Pricing Date	Exit Date	Time to Exit (Years)	Acquiror	Premium (Discount) to IPO Pricing
Reverse Merger	Please contact Ravi Mehrotra for the full report mehrotra@mtspartners.com				
	Total: 10				Average: (73%)
Bankruptcy	Please contact Ravi Mehrotra for the full report mehrotra@mtspartners.com				
	Total: 6				

Valuation Dynamics of ADR Offerings

Total Market Cap at IPO and Total Raise of ADR Offerings



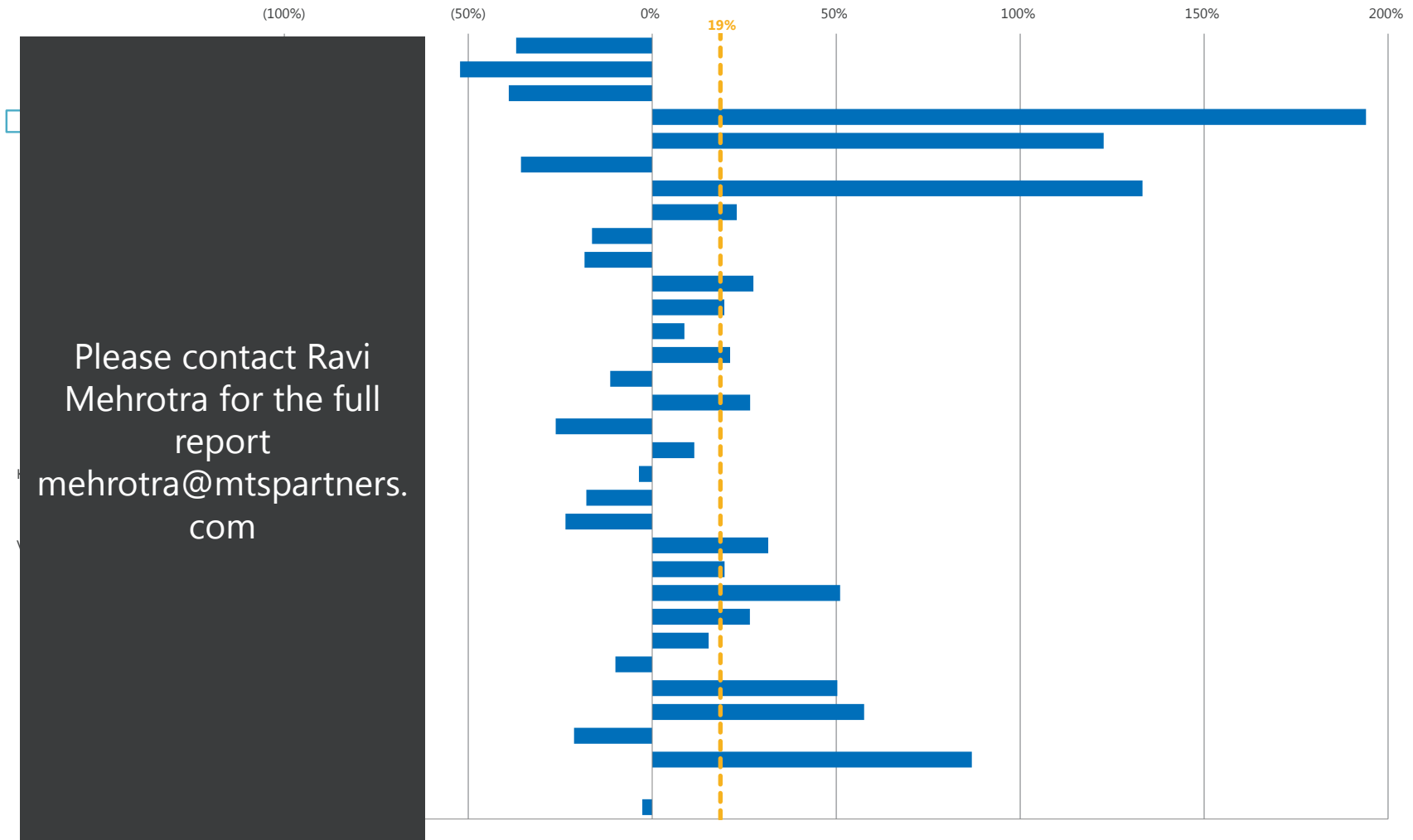
Source(s): MTS and Dealogic, as of 06/30/2018.



4. 2012 – YTD 2018 Performance Since IPO

Post-IPO Performance Based on Offer Price to Current Price

Class of 2018 (n=33) Sorted by Date and Showing Post-Money Valuation at IPO Pricing

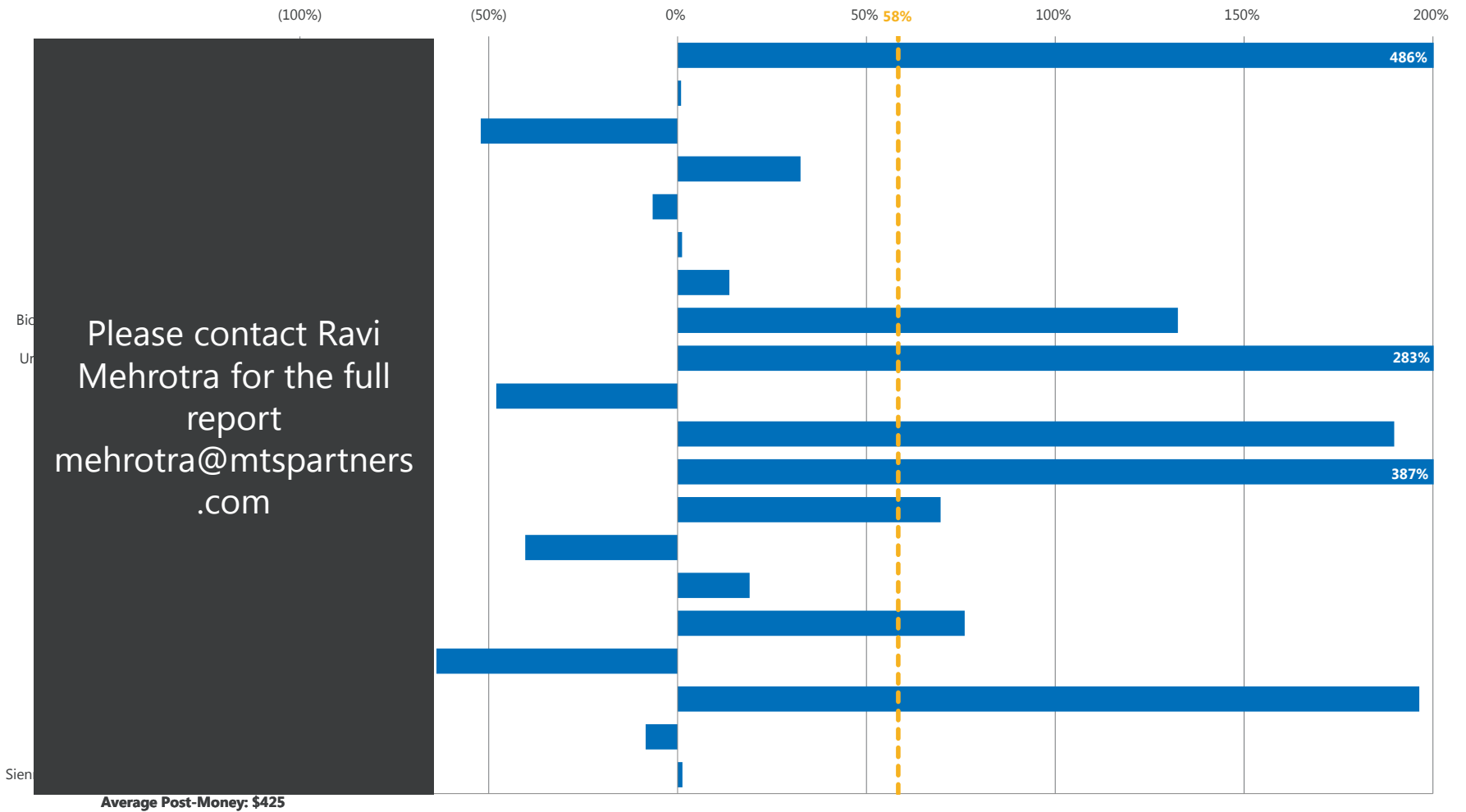


Note(s): All \$ in mm.

Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

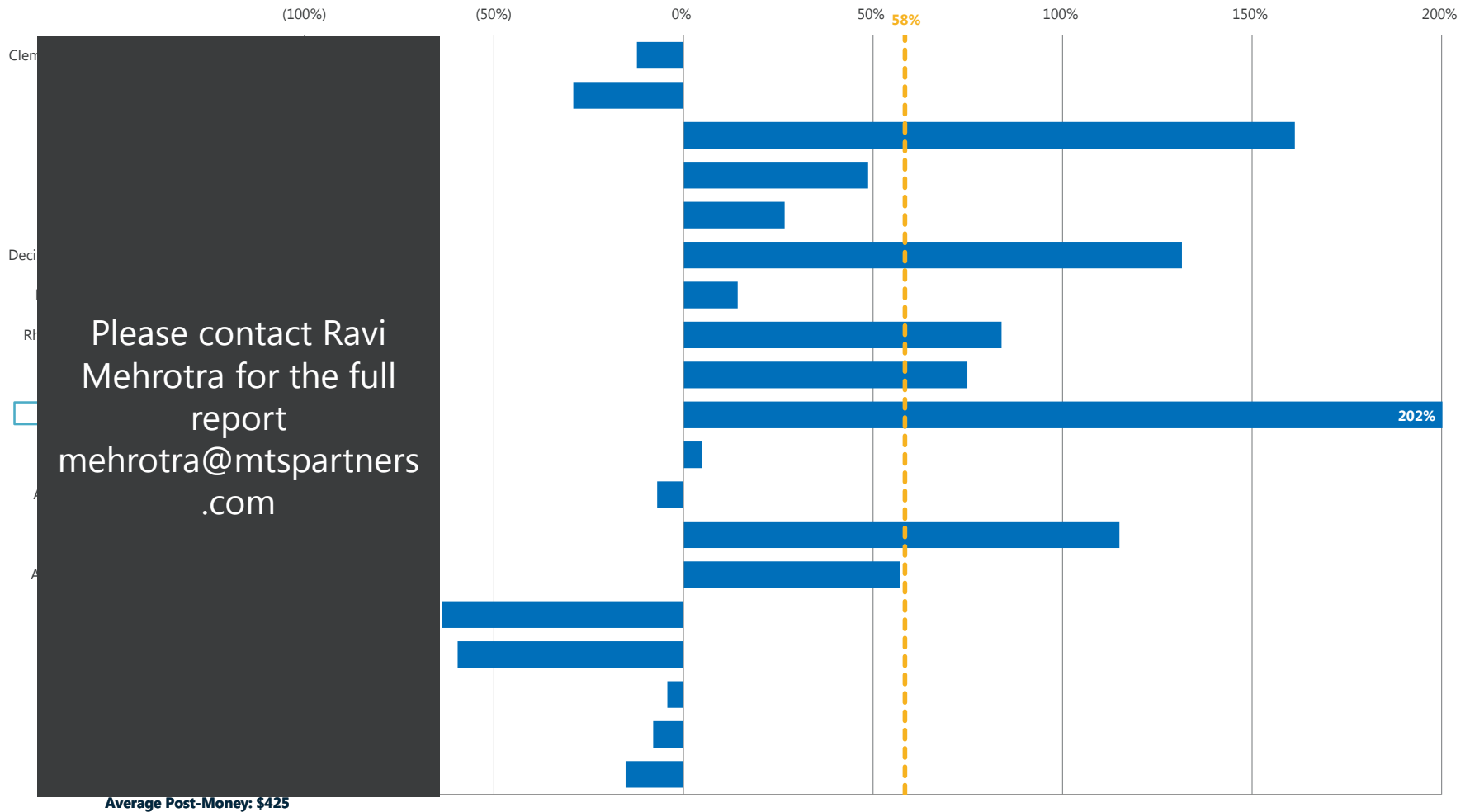
Class of 2017 (n=39) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

Class of 2017 (n=39) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)

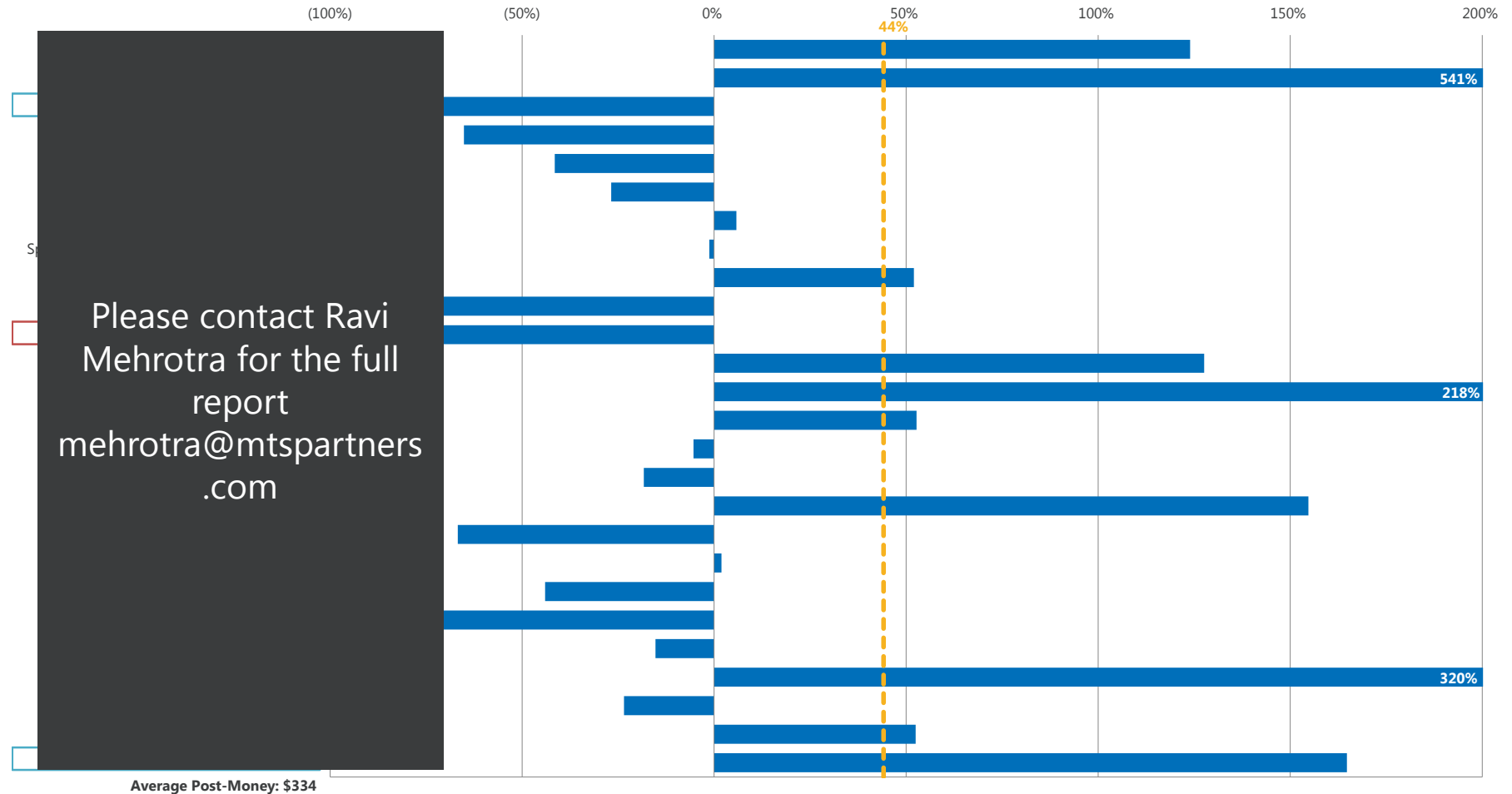


Note(s): All \$ in mm.

Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

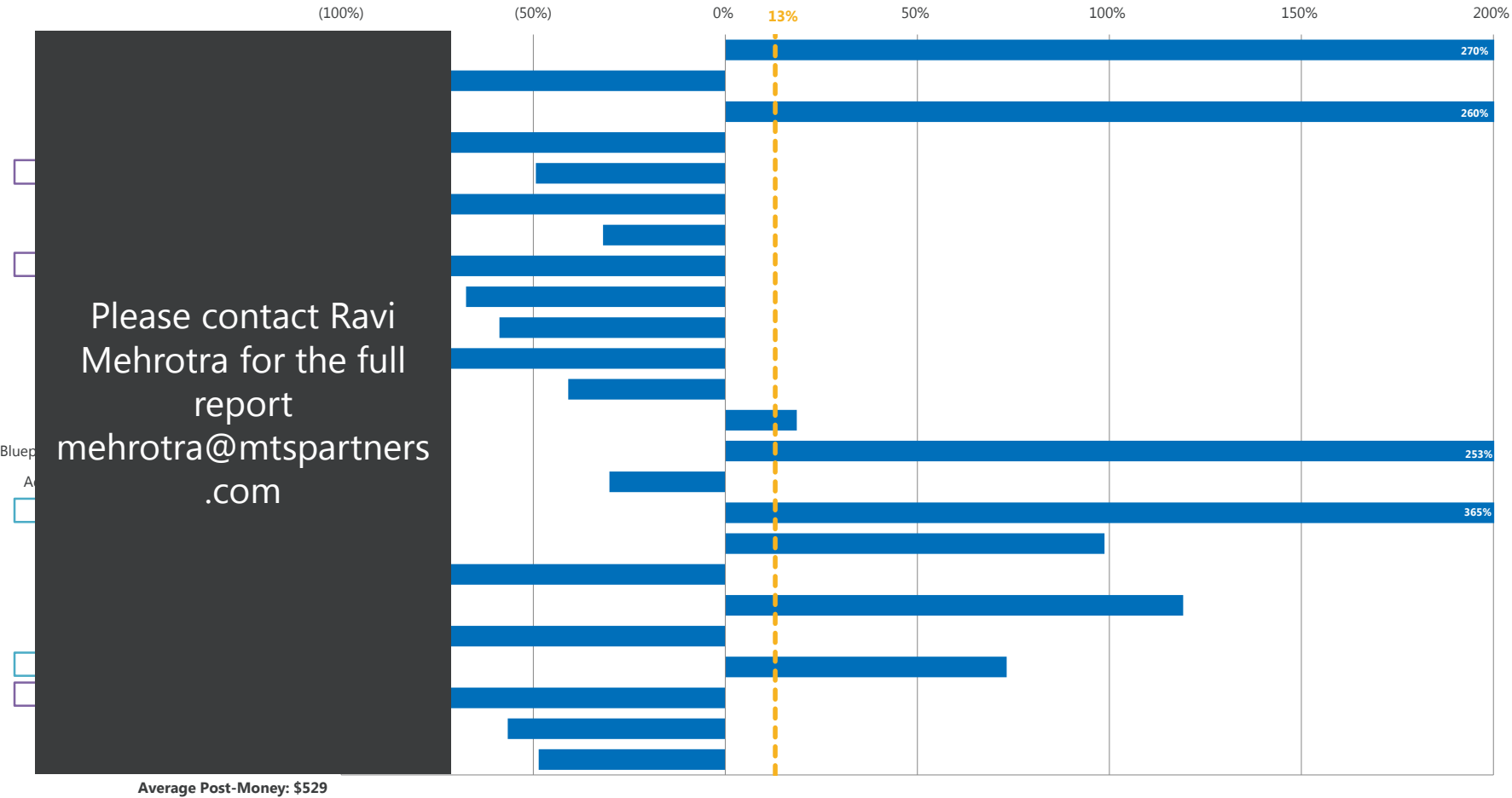
Class of 2016 (n=26) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies. Red box indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

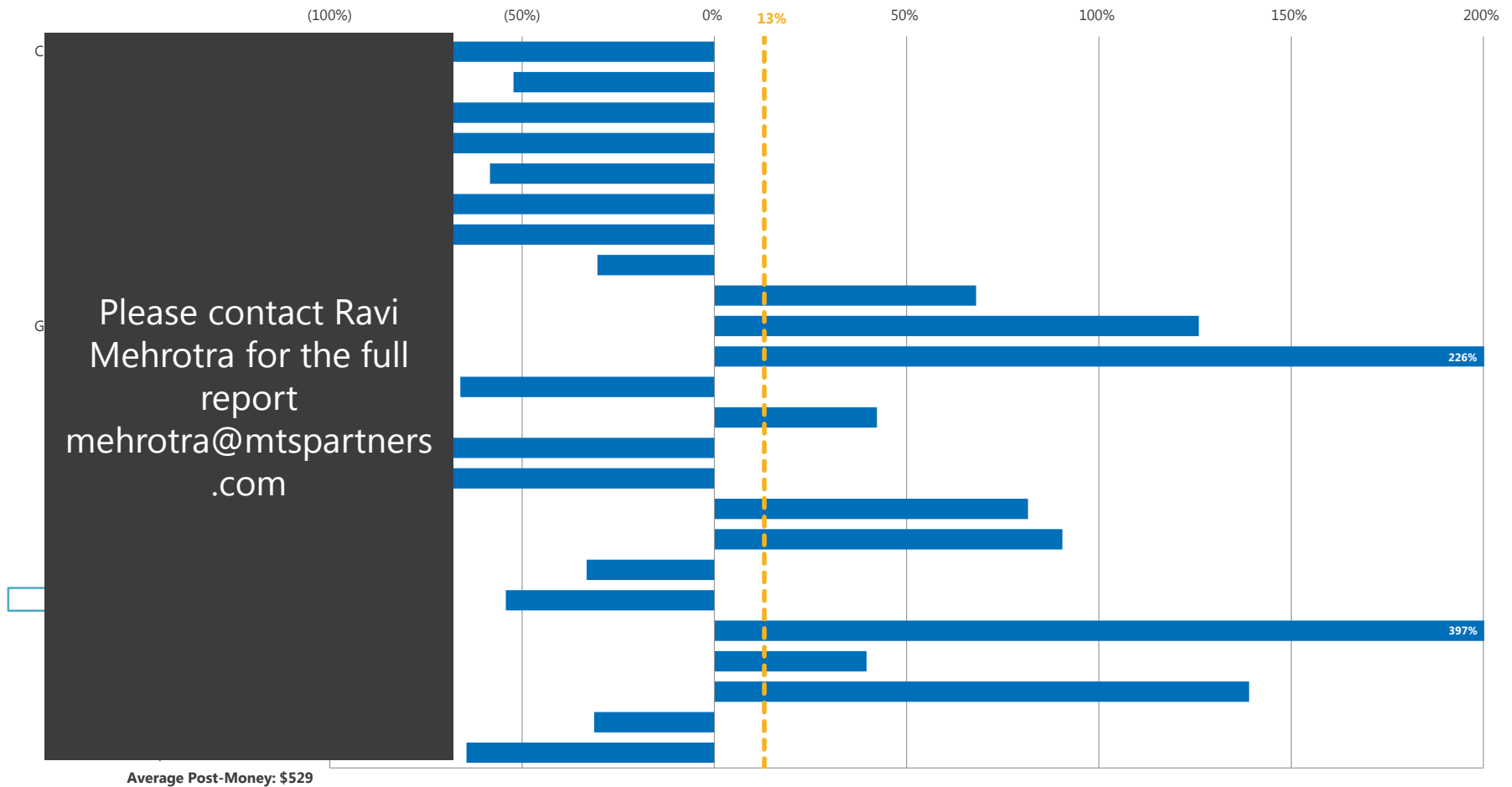
Class of 2015 (n=48) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

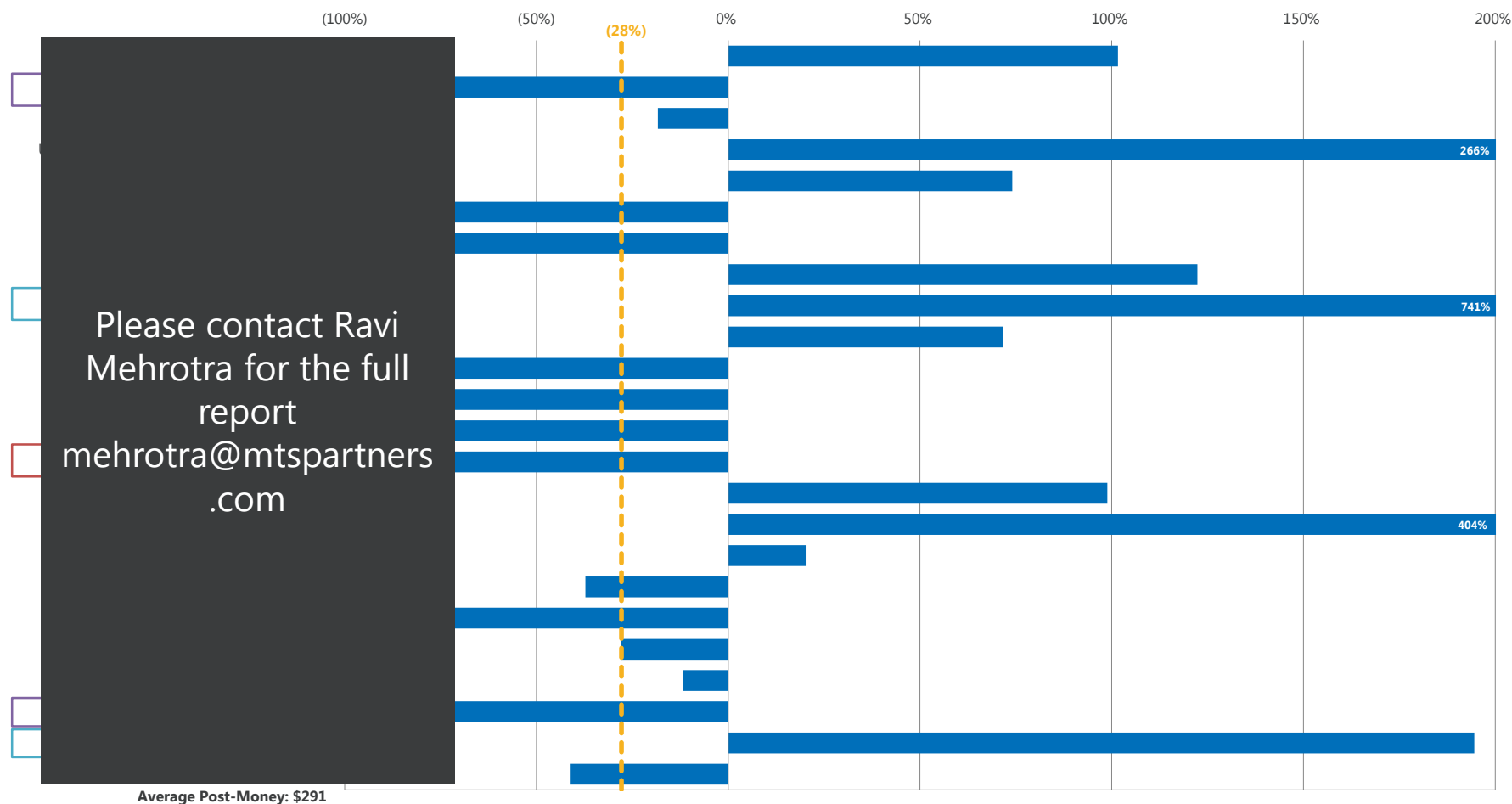
Class of 2015 (n=48) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)



Note(s): All \$ in mm. Blue box indicates acquired companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

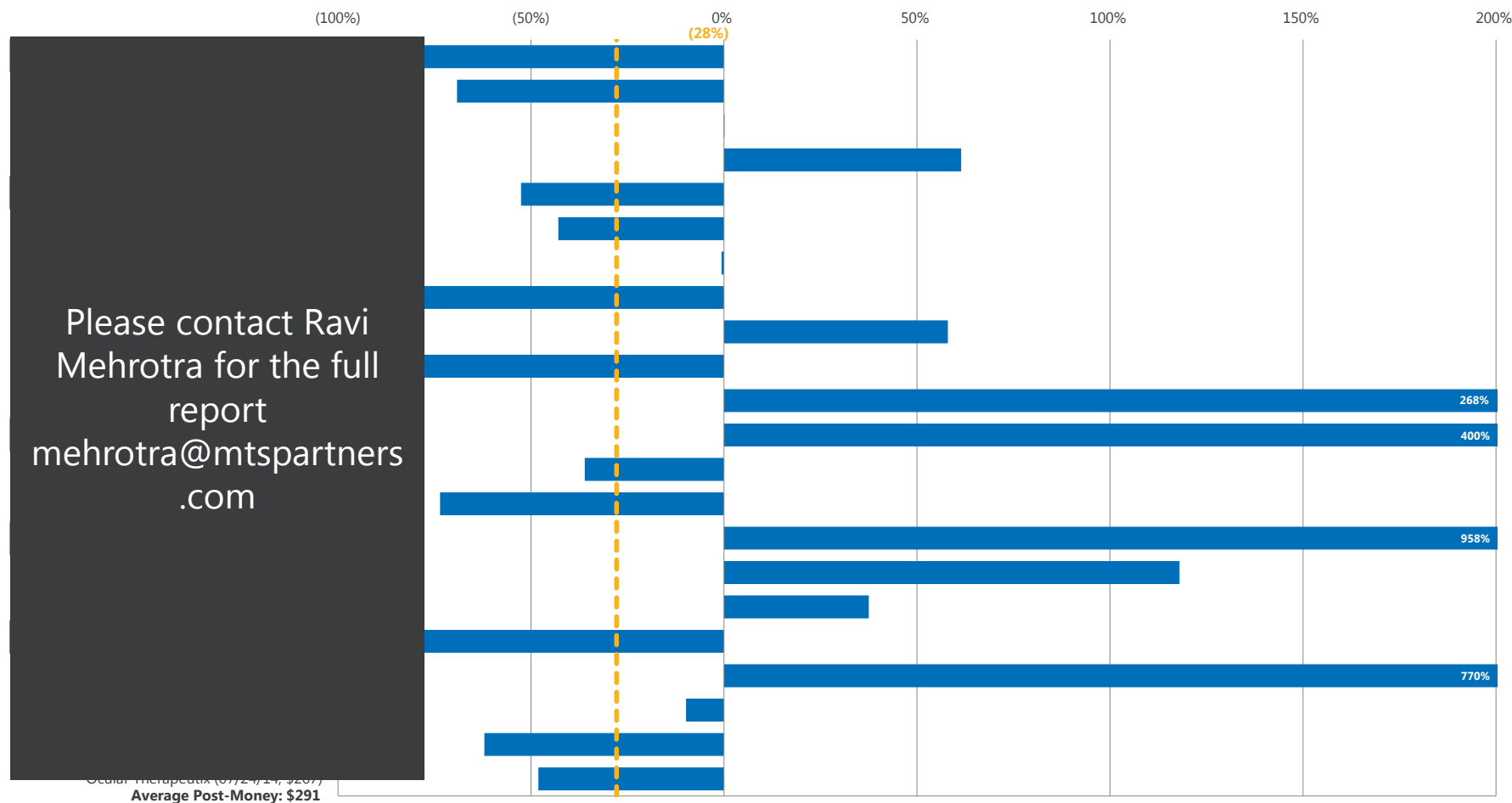
Class of 2014 (n=72) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger. Red box indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

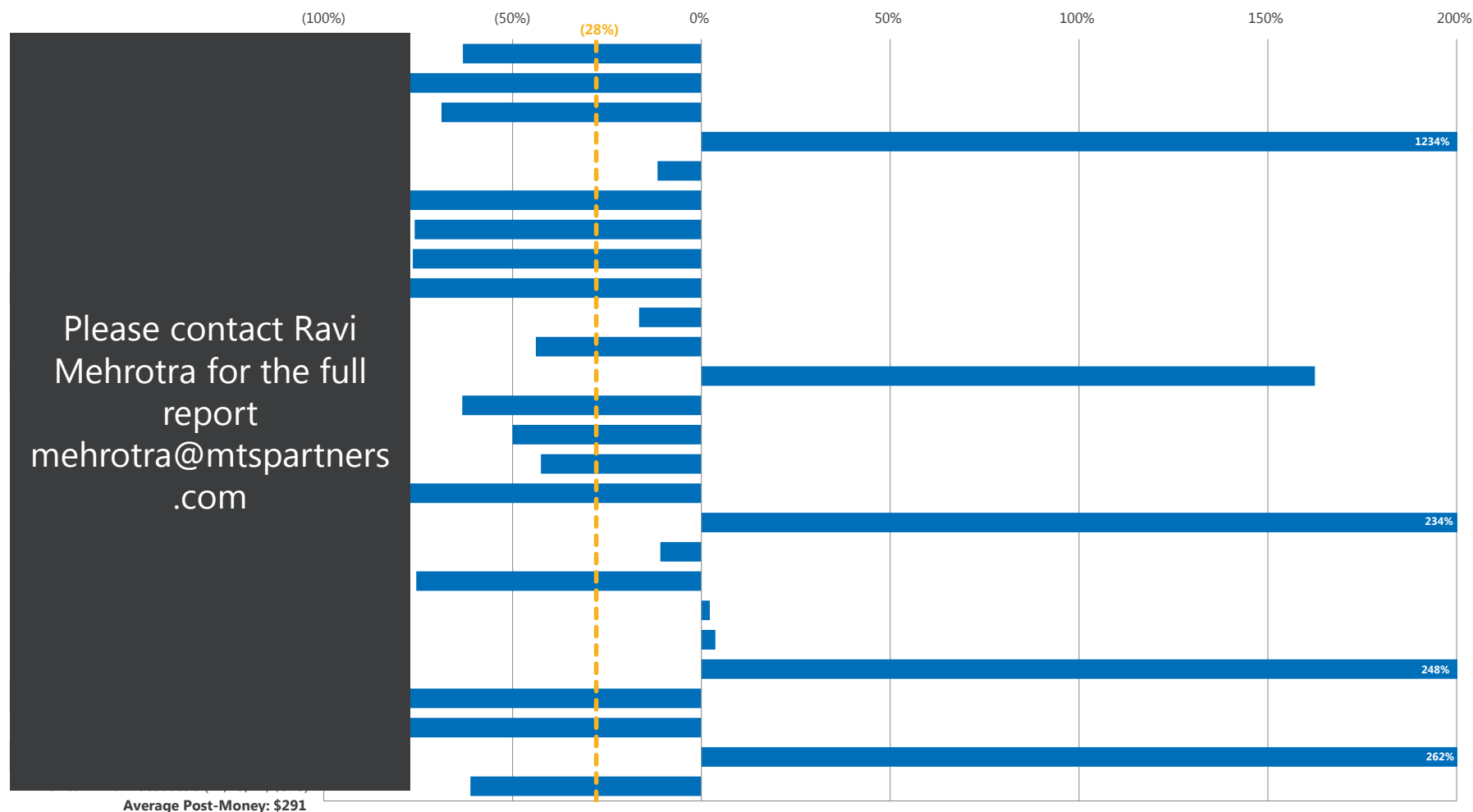
Class of 2014 (n=72) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)



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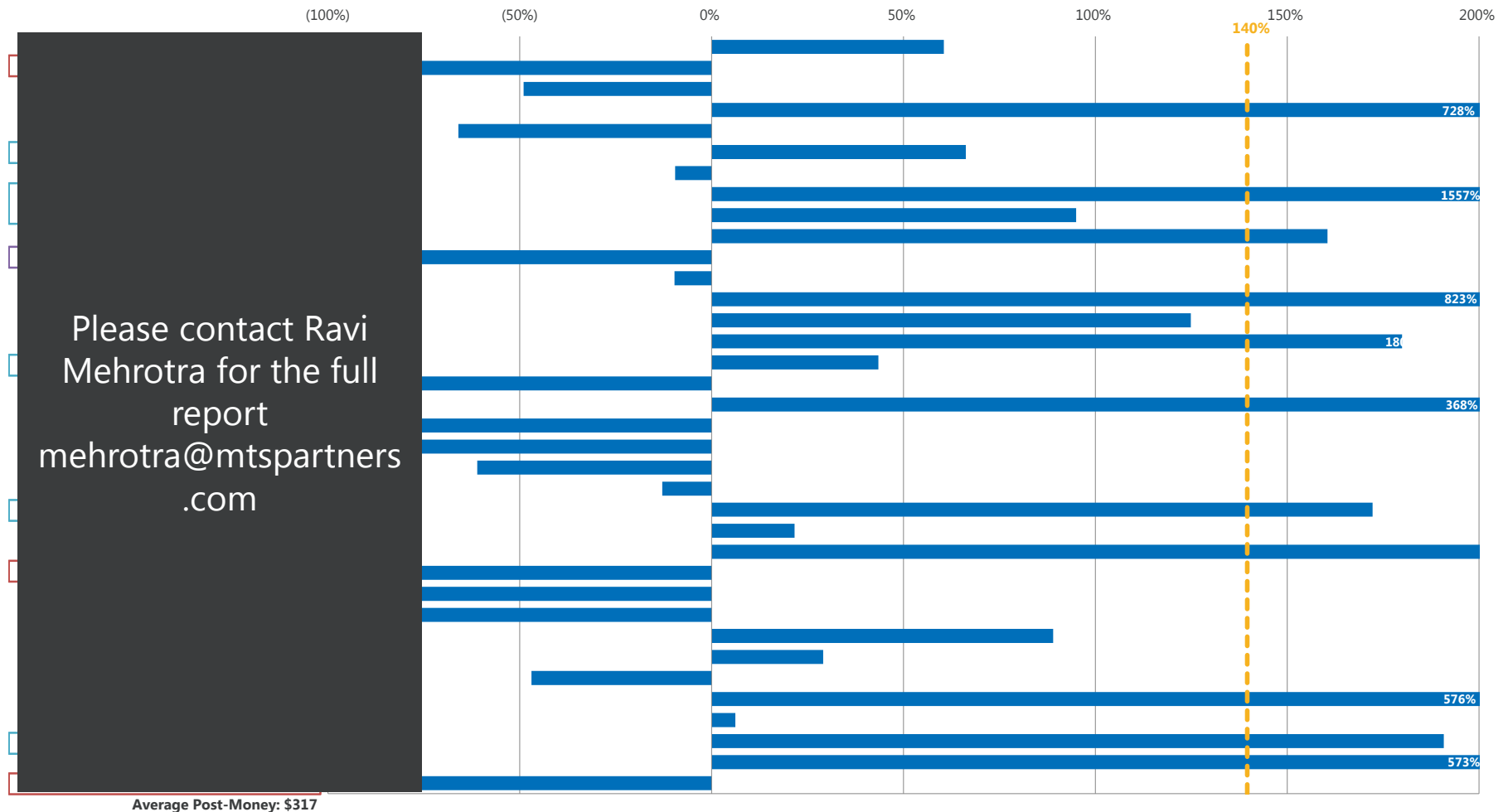
Class of 2014 (n=72) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)



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Post-IPO Performance Based on Offer Price to Current Price

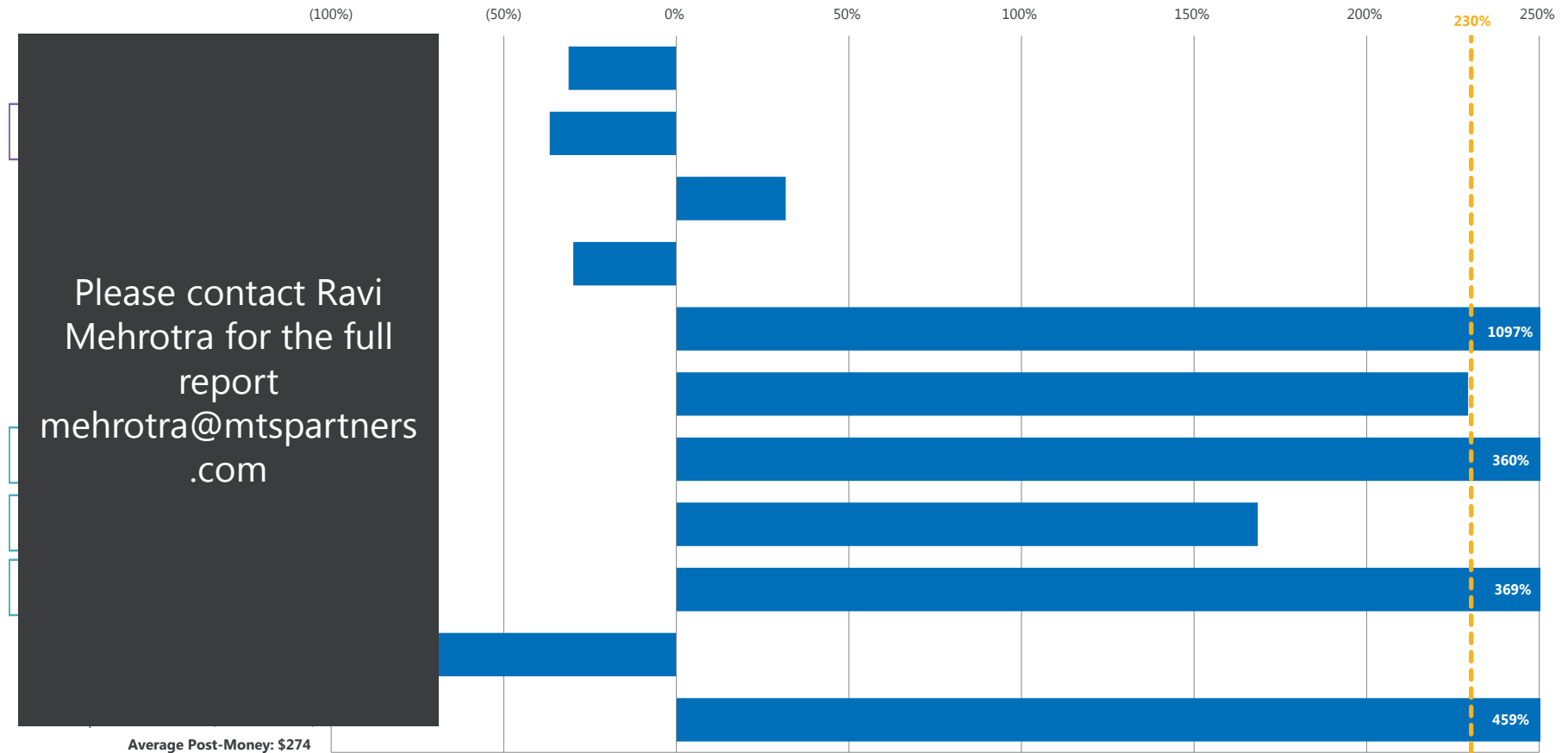
Class of 2013 (n=36) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger. Red box indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Post-IPO Performance Based on Offer Price to Current Price

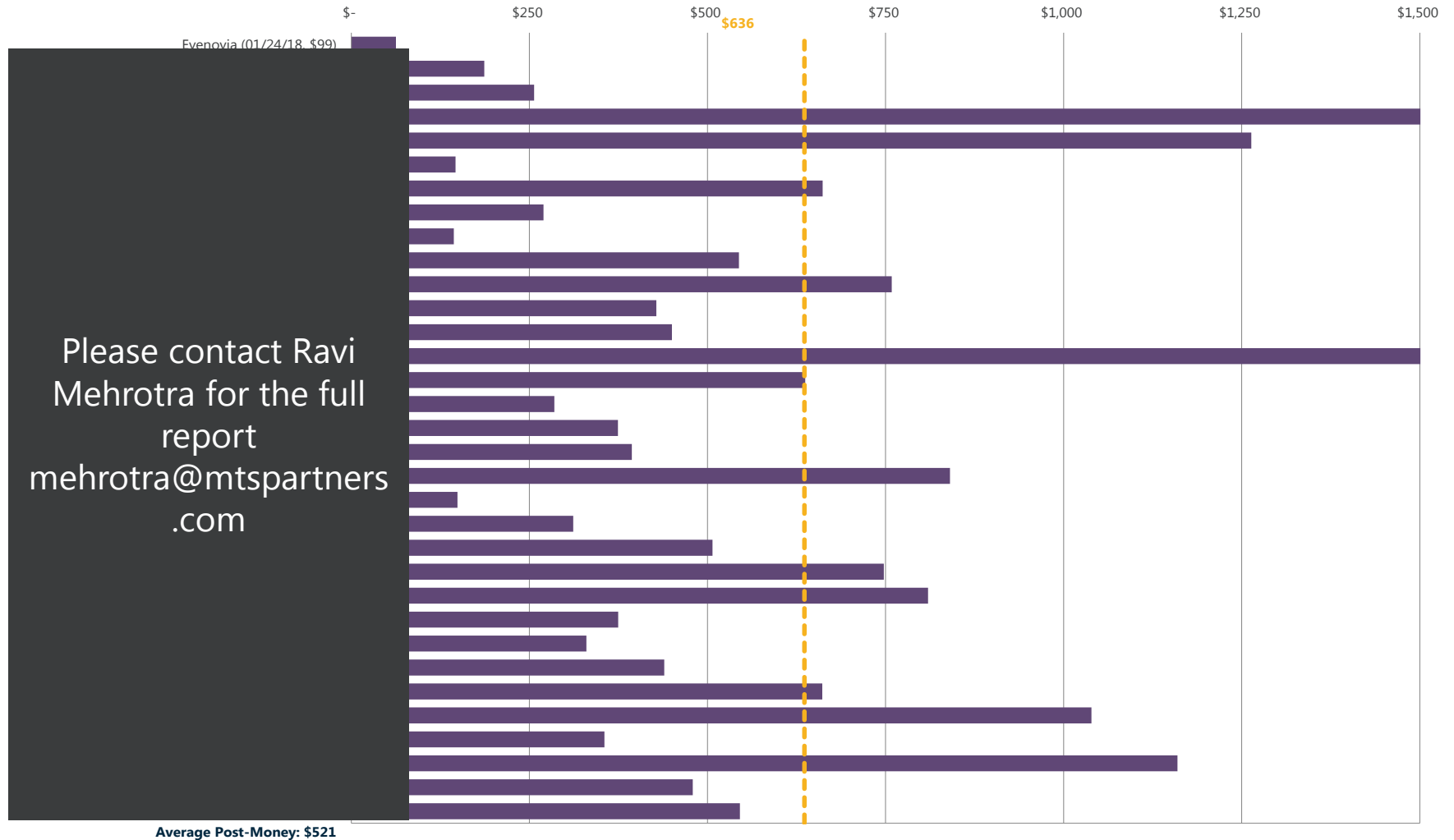
Class of 2012 (n=11) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

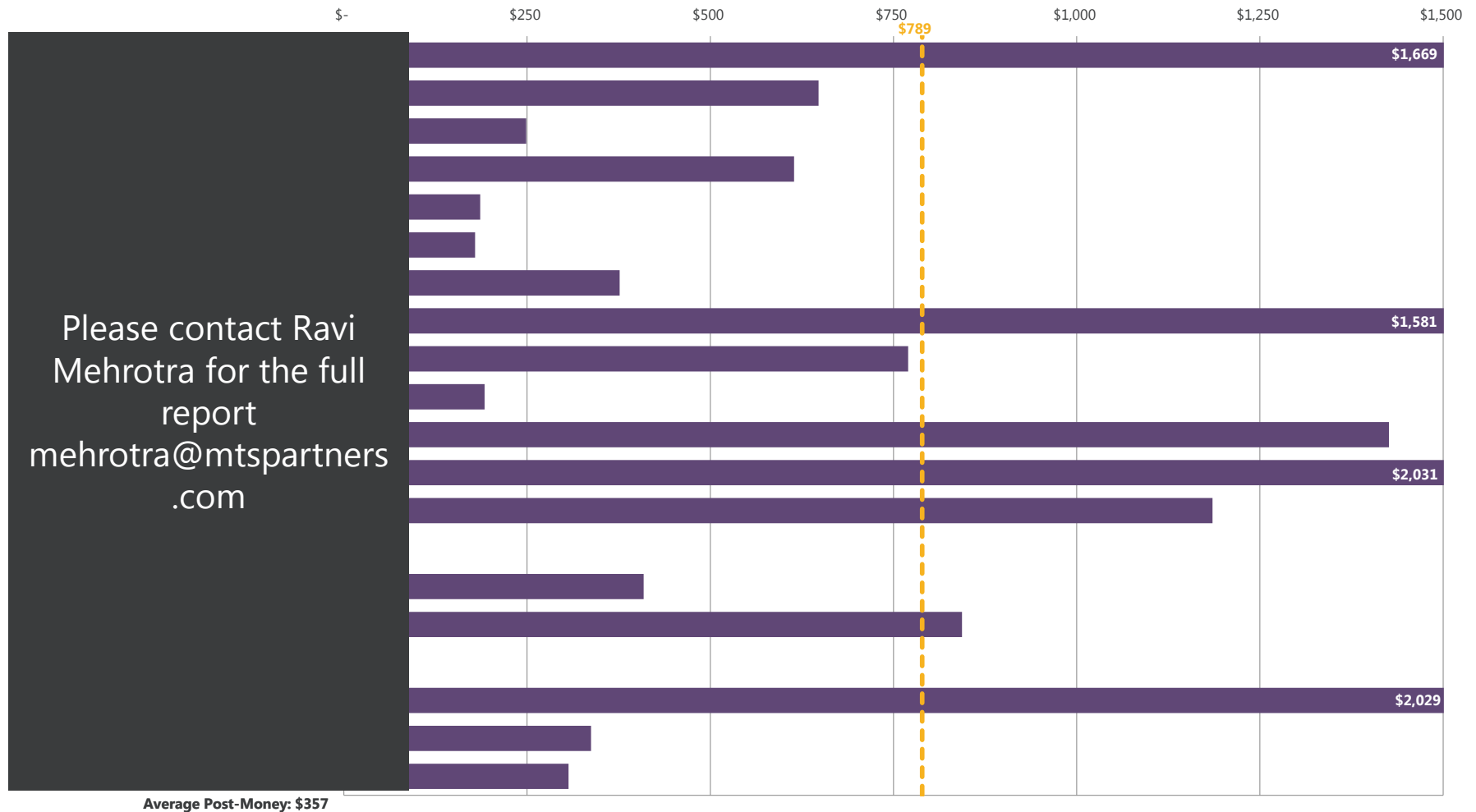
Class of 2018 (n=33) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

Class of 2017 (n=39) Sorted by Date and Showing Post-Money Valuation at IPO Pricing

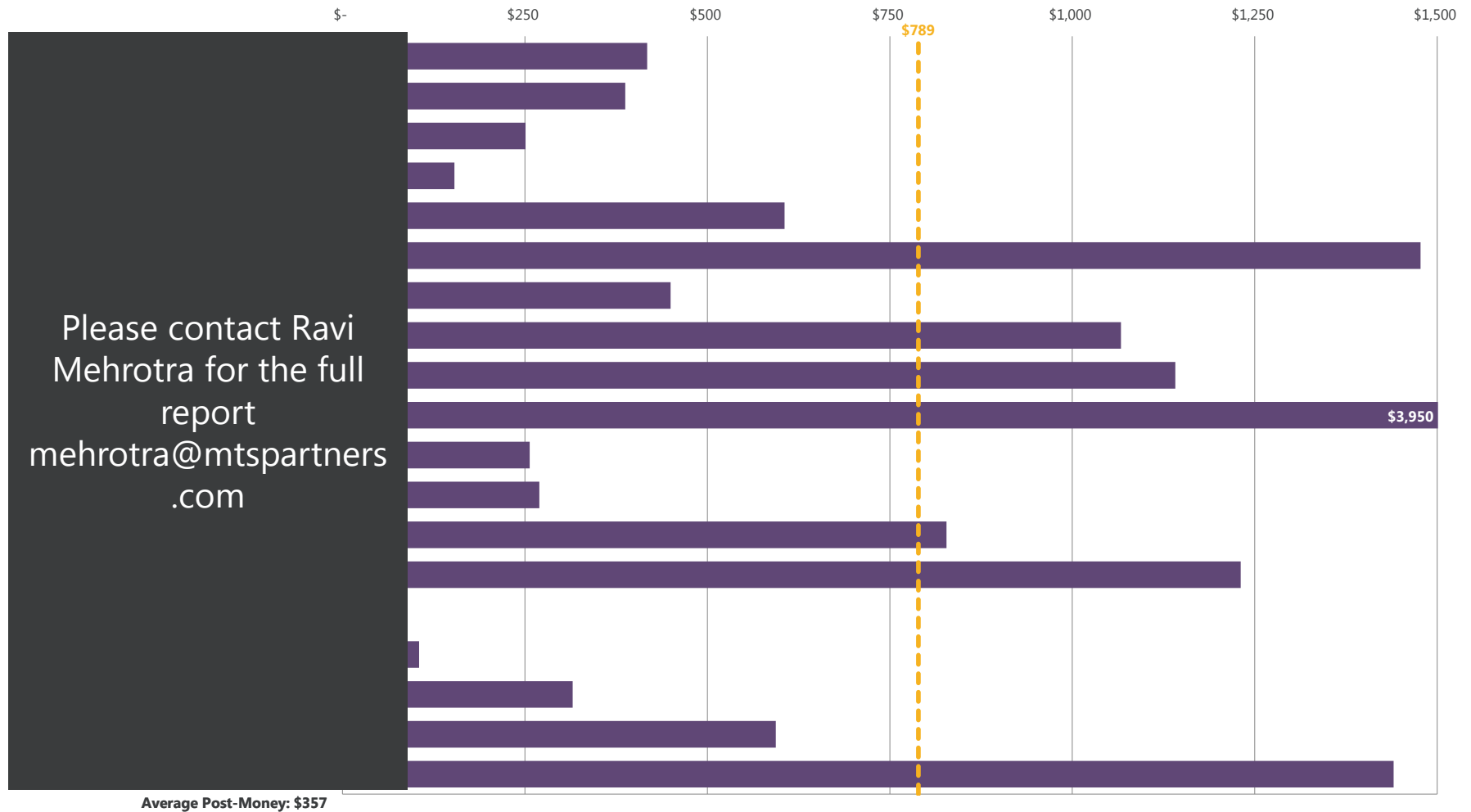


Note(s): All \$ in mm.

Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

Class of 2017 (n=39) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)

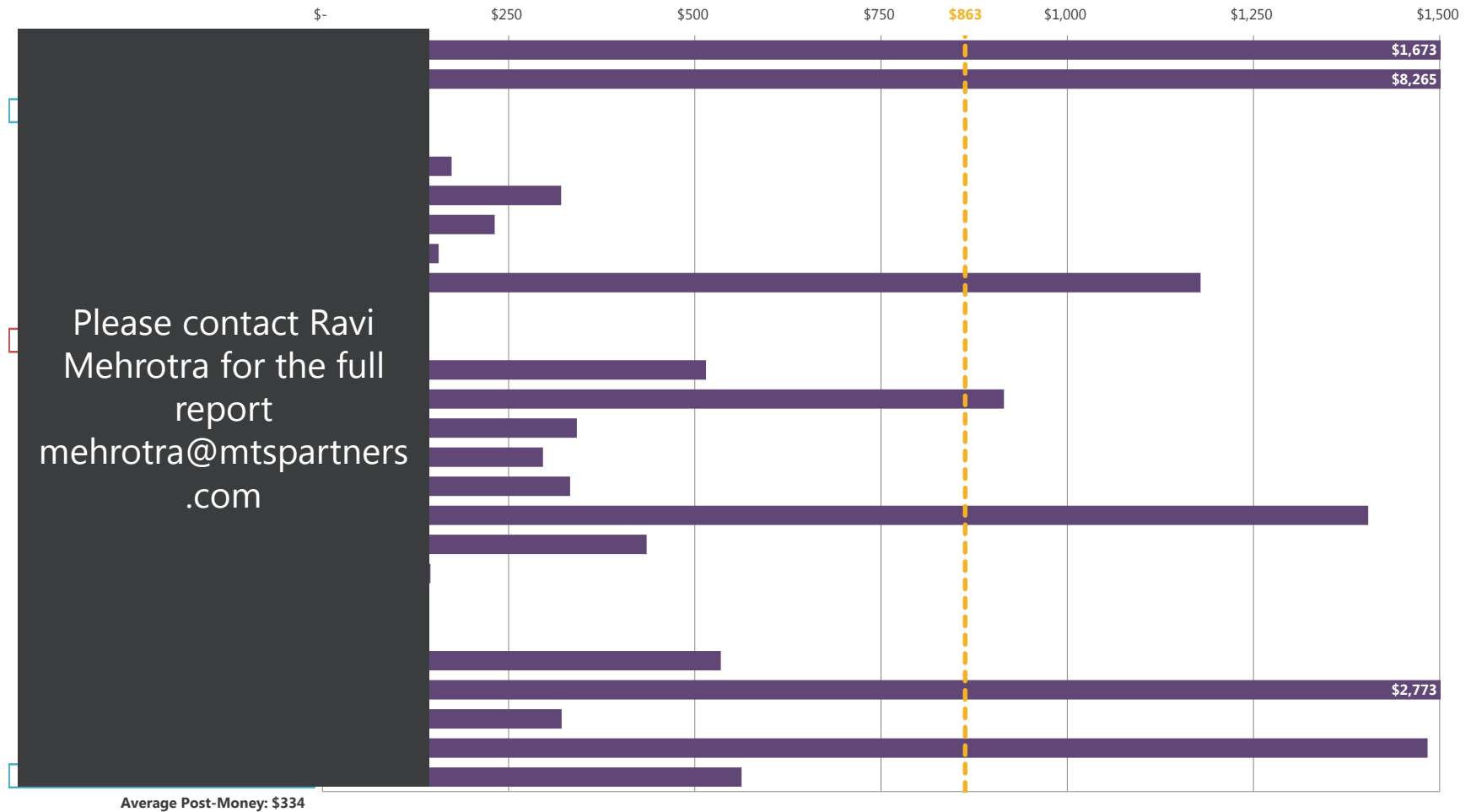


Note(s): All \$ in mm.

Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

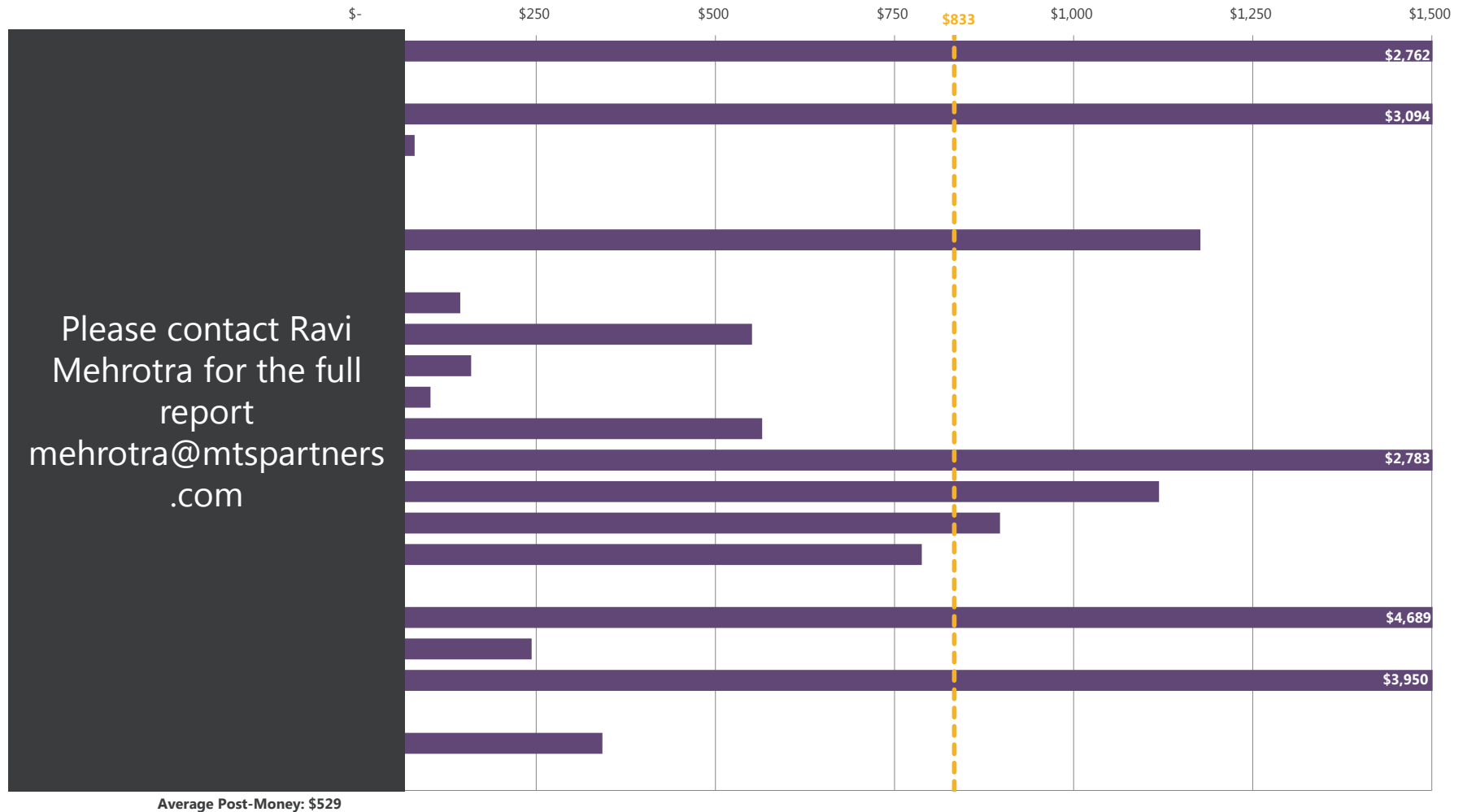
Class of 2016 (n=26) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Red box indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

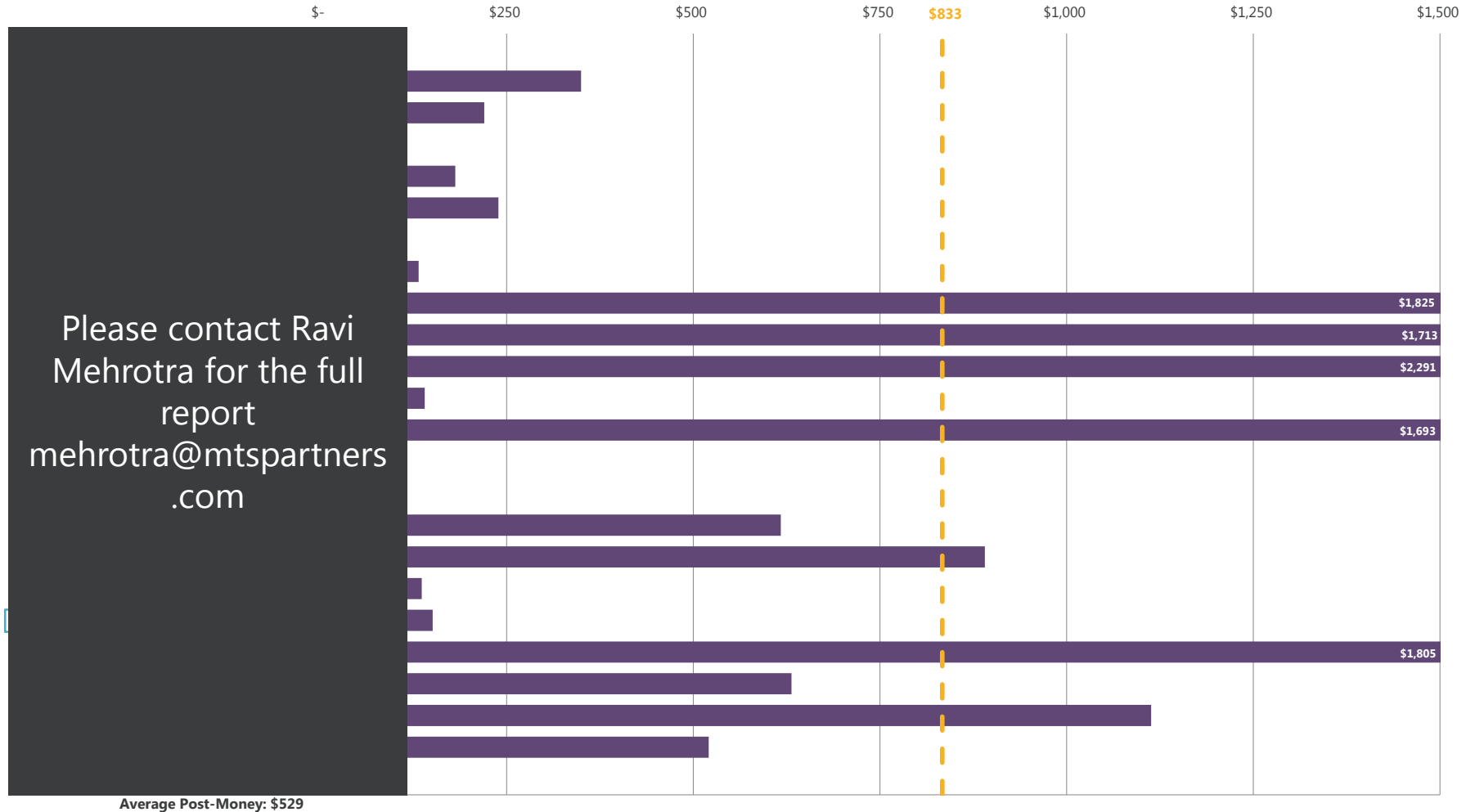
Class of 2015 (n=48) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

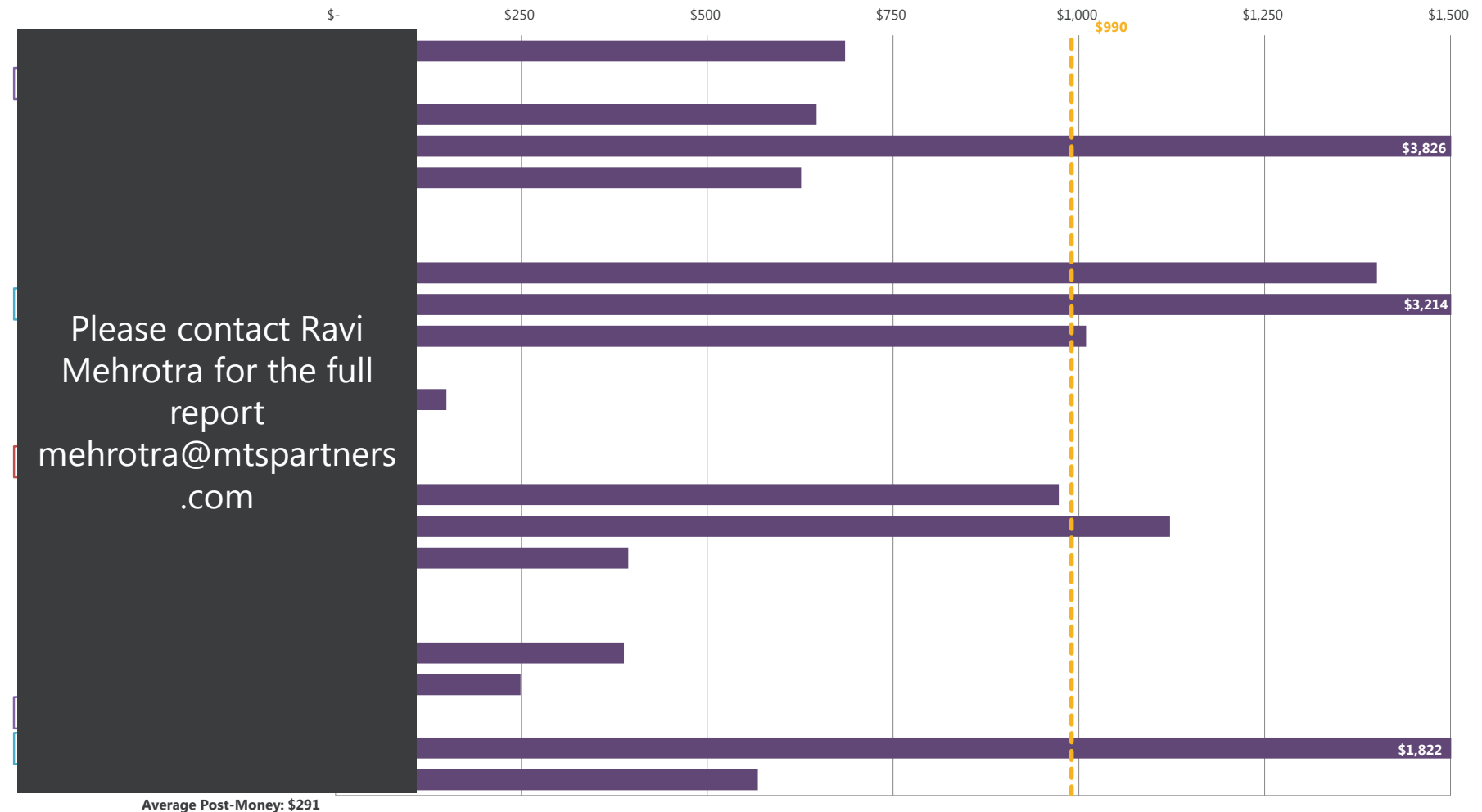
Class of 2015 (n=48) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)



Note(s): All \$ in mm. Blue box indicates acquired companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

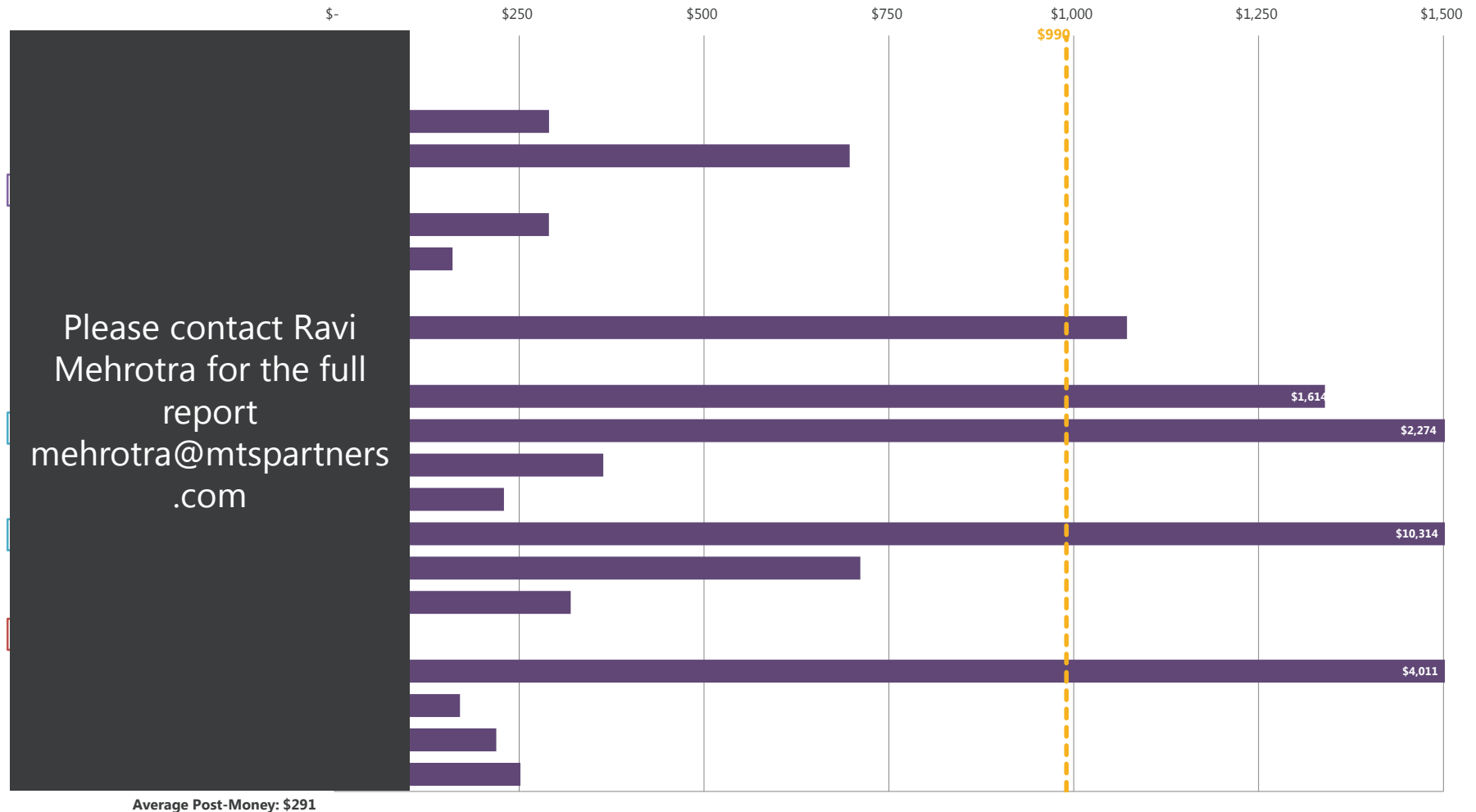
Class of 2014 (n=72) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger. Red box indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

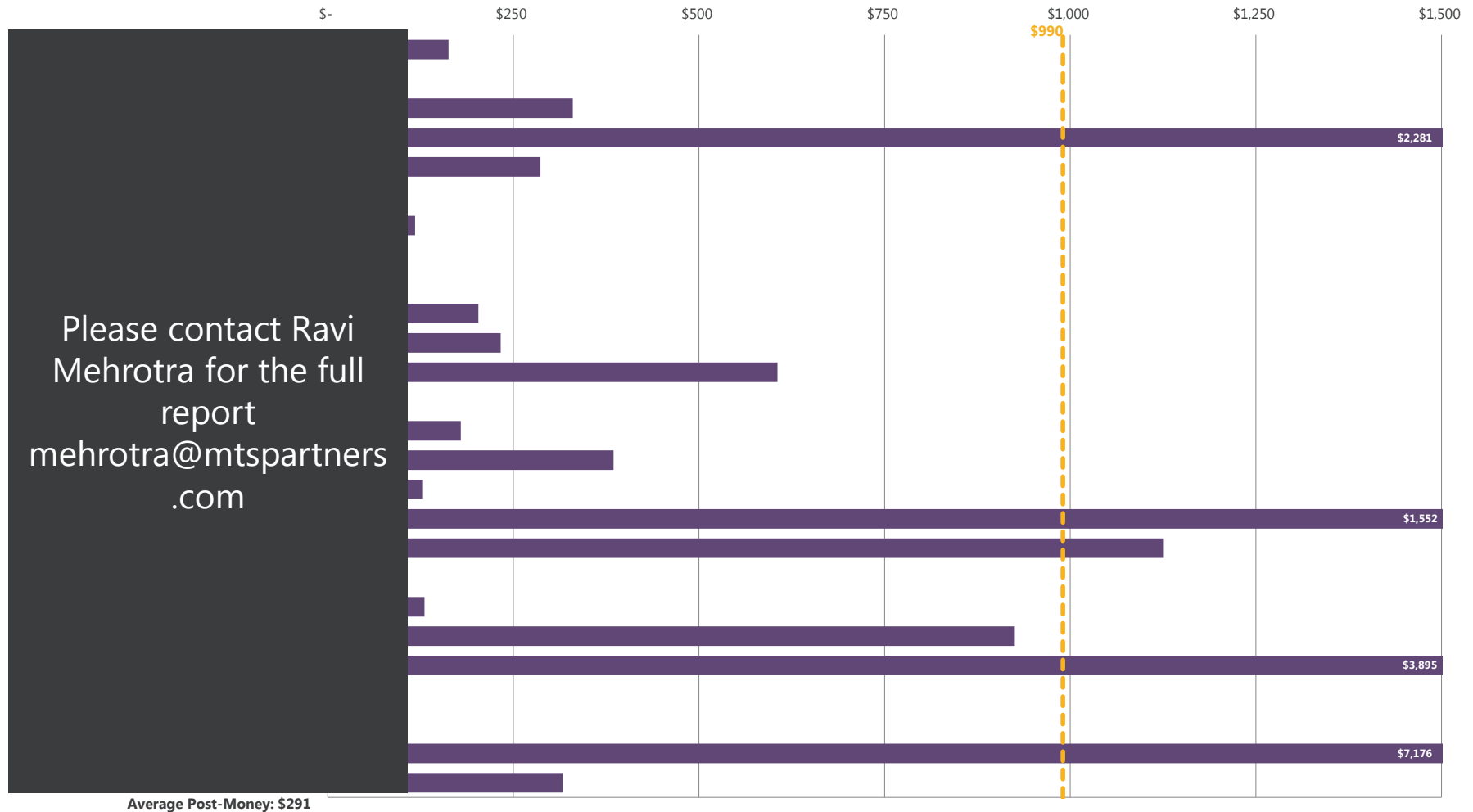
Class of 2014 (n=72) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

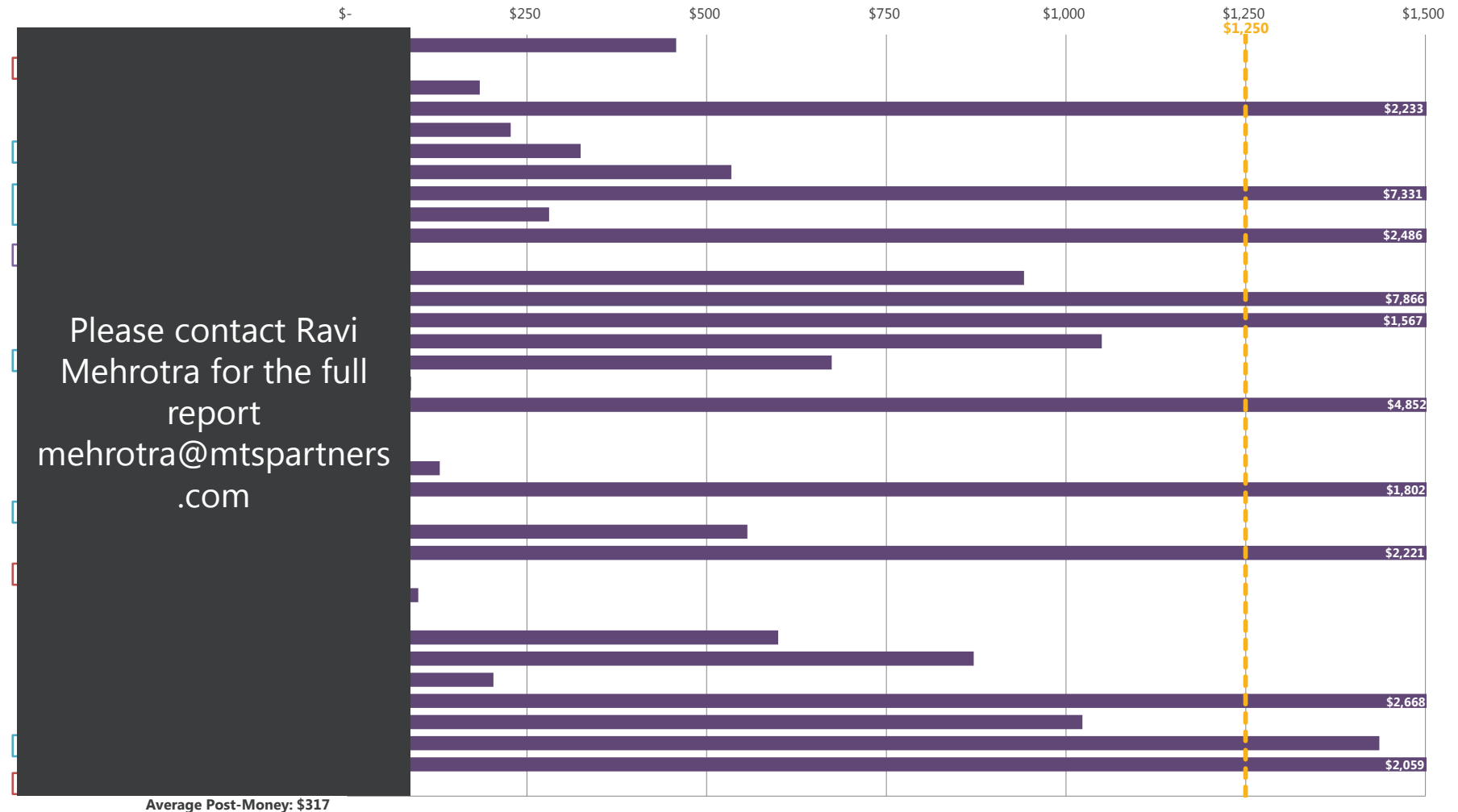
Class of 2014 (n=72) Sorted by Date and Showing Post-Money Valuation at IPO Pricing (cont'd)



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

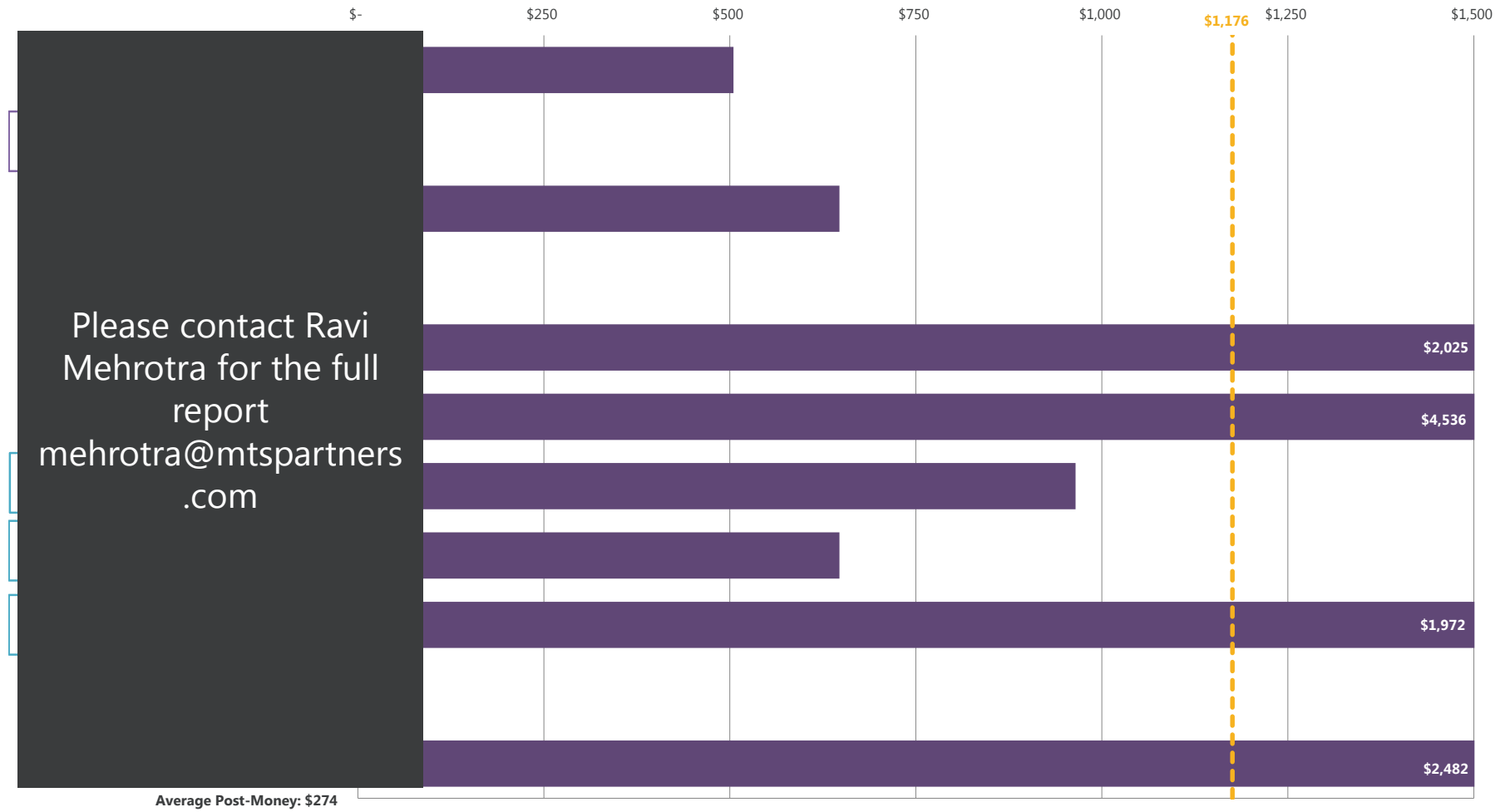
Class of 2013 (n=36) Sorted by Date and Showing Post-Money Valuation at IPO Pricing



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger. Red box indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Current Market Capitalization

Class of 2012 (n=11) Sorted by Date and Showing Post-Money Valuation



Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.



5. 2012-H1:18 Detailed US IPO Biotech Database

IPO Summary

H1 2018 (n=33)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual			Post IPO Performance				
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	Return Since IPO
06/27/18														(3%)
06/27/18														0%
06/27/18														87%
06/26/18														(21%)
06/21/18														58%
06/20/18														50%
06/20/18														(10%)
06/20/18														15%
06/20/18														27%
06/20/18														51%
06/19/18														20%
06/14/18														32%
06/07/18														(24%)
05/24/18														(18%)
05/23/18														(4%)
05/23/18														11%
05/08/18														(26%)
05/04/18														27%
05/02/18														(11%)
04/18/18														21%
04/18/18														9%
03/28/18														20%
03/27/18														28%
03/14/18														(18%)
03/08/18														(16%)
02/13/18														23%
02/07/18														133%
01/31/18														(36%)
01/25/18														123%
01/25/18														194%
01/25/18														(39%)
01/24/18														(52%)
01/24/18														(37%)
Median					\$85	NA	\$15	0%	\$100	\$117	97%	\$440	34%	19%
														11%

Note(s): Blue shading indicates acquired companies. Orange shading indicates ADR offerings.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2017 (n=39)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual			Post IPO Performance				
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	Return Since IPO
12/07/17														(15%)
12/06/17														(8%)
12/06/17														(4%)
11/16/17														(60%)
11/15/17														(64%)
11/08/17														57%
11/07/17														115%
11/01/17														(7%)
11/01/17														5%
10/24/17														202%
10/12/17														75%
10/04/17														84%
09/27/17														14%
09/27/17														131%
09/27/17														27%
09/19/17														49%
09/19/17														161%
08/08/17														(29%)
08/01/17														(12%)
07/26/17														1%
07/19/17														(8%)
07/13/17														196%
06/28/17														(64%)
06/28/17														76%
06/27/17														19%
06/26/17														(40%)
06/13/17														70%
05/17/17														387%
05/16/17														190%
05/04/17														(48%)
05/03/17														283%
05/03/17														132%

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- (1) L
- (2) In the US, Ablynx is an ADR offering.
- Note(s): Blue shading indicates acquired companies. Orange shading indicates ADR offerings.
- Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2017 (n=39) (cont'd)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual						Post IPO Performance					
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Offer Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	1 Day	30 Days	Current Price	Market Cap (\$mm)	Return Since IPO
04/27/17																		14%
04/26/17																		1%
04/12/17																		(7%)
03/08/17																		33%
01/26/17																		(52%)
01/25/17																		1%
01/25/17																		374%
																		58% 14%

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Note(s): Orange shading indicates ADR offerings.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2016 (n=26)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual			Post IPO Performance				
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	Return Since IPO
12/14/16														165%
10/27/16														52%
10/26/16														(23%)
10/19/16														320%
09/23/16														(15%)
09/21/16														(73%)
08/11/16														(44%)
08/05/16														2%
07/27/16														(67%)
07/20/16														155%
06/30/16														(18%)
06/22/16														(5%)
06/02/16														53%
05/26/16														218%
05/19/16														128%
05/18/16														(100%)
05/12/16														(86%)
05/06/16														52%
05/06/16														(1%)
04/07/16														6%
03/23/16														(27%)
03/02/16														(42%)
02/11/16														(65%)
02/10/16														(100%)
02/03/16														541%
02/03/16														124%
														44% (3%)

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(1) If lead program is peptide undergoing NDA regulatory pathway, we classed it as biologic.
 Note(s): Blue shading indicates acquired companies. Orange shading indicates ADR offerings. Red shading indicates bankrupt companies.
 Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2015 (n=48)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Offer Price	Offer Premium (Disc.)	Offer Size (\$mm)	Actual			Insider Participation	Post IPO Performance				
					Offer Size (\$mm)	Filing Range (\$)				Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)		1 Day	30 Days	Current Price	Market Cap (\$mm)	Return Since IPO
11/19/15																		(64%)
11/13/15																		(31%)
11/11/15																		139%
11/11/15																		40%
10/29/15																		397%
10/22/15																		(54%)
10/15/15																		(33%)
10/08/15																		91%
10/07/15																		82%
10/01/15																		(91%)
10/01/15																		(75%)
10/01/15																		42%
09/17/15																		(66%)
09/17/15																		226%
08/12/15																		126%
08/06/15																		68%
08/05/15																		(30%)
07/30/15																		(90%)
07/28/15																		(88%)
07/23/15																		(58%)
07/16/15																		(91%)
07/15/15																		(88%)
06/26/15																		(52%)
06/25/15																		(92%)
06/24/15																		(49%)
06/18/15																		(57%)
06/17/15																		(80%)
06/11/15																		73%
06/10/15																		(85%)
05/13/15																		119%
05/07/15																		(94%)
05/07/15																		99%

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(1)

(2) In the US, Biotie is an ADR offering.

Note(s): Blue shading indicates acquired companies. Purple shading indicates companies that were acquired through a reverse merger. Orange shading indicates ADR offerings.

Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2015 (n=48) (cont'd)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial			Actual				Post IPO Performance							
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Offer Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	1 Day	30 Days	Current Price	Market Cap (\$mm)	Return Since IPO	
05/06/15	[REDACTED]																	365%	
05/05/15																		(30%)	
04/30/15																		253%	
04/28/15																		19%	
04/16/15																		(41%)	
04/15/15																		(76%)	
04/15/15																		(59%)	
04/15/15																		(68%)	
04/09/15																		(77%)	
03/24/15																		(32%)	
03/04/15																		(75%)	
02/18/15																		(49%)	
01/30/15																		(73%)	
01/30/15																		260%	
01/28/15																		(94%)	
01/27/15																		270%	
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Note(s): Blue shading indicates acquired companies. Purple shading indicates companies that were acquired through a reverse merger. Orange shading indicates ADR offerings.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2014 (n=72)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Offer Price	Offer Premium (Disc.)	Offer Size (\$mm)	Actual			Insider Participation	Post IPO Performance			Market Cap (\$mm)	Return Since IPO
					Offer Size (\$mm)	Filing Range (\$)				Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)		1 Day	30 Days	Current Price		
12/19/14																		(61%)
12/19/14																		262%
12/02/14																		(77%)
11/19/14																		(86%)
11/14/14																		248%
11/05/14																		4%
11/04/14																		2%
10/22/14																		(76%)
10/21/14																		(11%)
10/16/14																		234%
10/14/14																		(87%)
10/03/14																		(43%)
10/02/14																		(50%)
09/30/14																		(63%)
09/18/14																		163%
09/18/14																		(44%)
09/17/14																		(17%)
09/16/14																		(93%)
09/11/14																		(76%)
08/12/14																		(76%)
08/05/14																		(87%)
07/31/14																		(12%)
07/31/14																		1234%
07/30/14																		(69%)
07/30/14																		(85%)
07/28/14																		(63%)
07/24/14																		(48%)
07/24/14																		(62%)
07/23/14																		(10%)
07/17/14																		770%
06/30/14																		(95%)
06/30/14																		38%

(1)

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(1) Note(s): All \$ in mm. Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger. Red box indicates bankrupt companies. Orange shading indicates ADR offerings.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2014 (n=72) (cont'd)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual			Post IPO Performance				
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	Return Since IPO
06/24/14														118%
06/20/14														958%
06/18/14														(74%)
06/18/14														(36%)
06/17/14														400%
06/05/14														268%
05/22/14														(92%)
05/08/14														58%
05/02/14														(84%)
05/01/14														(1%)
04/16/14														(43%)
04/10/14														(53%)
04/09/14														61%
04/02/14														0%
03/26/14														(69%)
03/20/14														(89%)
03/19/14														(41%)
03/13/14														195%
03/12/14														(87%)
03/12/14														(12%)
03/11/14														(28%)
03/06/14														(76%)
03/06/14														(37%)
02/12/14														20%
02/11/14														404%
02/11/14														99%
02/10/14														(100%)
02/06/14														(98%)
02/05/14														(81%)
02/05/14														(96%)
02/05/14														72%
02/04/14														741%
02/04/14														122%

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(1) Lead program is peptide undergoing NDA regulatory pathway, we classed it as biologic.

Note(s): Blue shading indicates acquired companies. Purple shading indicates companies that were acquired through a reverse merger. Red shading indicates bankrupt companies.

Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2014 (n=72) (cont'd)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual					Post IPO Performance					Market Cap (\$mm)	Return Since IPO
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Offer Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	1 Day	30 Days	Current Price		
02/04/14																	(93%)	
01/31/14																	(79%)	
01/31/14																	74%	
01/31/14																	266%	
01/30/14																	(18%)	
01/30/14																	(86%)	
01/09/14																	102%	
																	56% (39%)	

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(1) Lead program is peptide undergoing NDA regulatory pathway, we classed it as biologic.
Note(s): Purple shading indicates companies that were acquired through a reverse merger.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2013 (n=36)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual			Post IPO Performance				
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	Return Since IPO
12/11/13														(100%)
12/02/13														573%
11/14/13														191%
11/06/13														6%
10/27/13														576%
10/16/13														(47%)
10/10/13														29%
09/30/13														89%
09/24/13														(79%)
09/24/13														(88%)
09/19/13														(99%)
09/18/13														223%
09/17/13														22%
08/21/13														172%
08/07/13														(13%)
07/24/13														(61%)
07/24/13														(97%)
07/23/13														(79%)
07/23/13														368%
07/17/13														(86%)
06/27/13														43%
06/25/13														180%
06/19/13														125%
06/18/13														823%
05/30/13														(10%)
05/21/13														(86%)
05/21/13														160%
05/15/13														95%
05/08/13														1557%
05/02/13														(10%)
04/11/13														66%

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Note(s): Blue box indicates acquired companies. Purple box indicates companies that were acquired through a reverse merger. Red box indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2013 (n=36) (cont'd)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual					Post IPO Performance						
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Offer Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	1 Day	30 Days	Current Price	Market Cap (\$mm)	Return Since IPO
04/10/13																		(66%)
03/20/13																		728%
03/19/13																		(49%)
01/31/13																		(93%)
01/30/13																		61%
																		140% 25%

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Note(s): Red shading indicates bankrupt companies.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

IPO Summary

2012 (n=11)

Pricing Date	Company	Stage at IPO	Therapeutic Area	Modality	Initial		Actual							Post IPO Performance				
					Offer Size (\$mm)	Filing Range (\$)	Offer Price	Offer Premium (Disc.)	Offer Size (\$mm)	Cash Raised to IPO	% IPO Raise to Prior Cash	Implied Valuation (\$mm)	Insider Participation	1 Day	30 Days	Current Price	Market Cap (\$mm)	Return Since IPO
10/11/11	Novartis																	459%
10/11/11																		(84%)
10/10/11																		369%
10/04/11																		168%
07/25/11																		360%
07/25/11																		229%
07/18/11																		1097%
06/27/11																		(30%)
04/30/11																		32%
03/28/11																		(37%)
01/27/11																		(31%)
																		230%
																	168%	

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Note(s): Blue shading indicates acquired companies. Purple shading indicates companies that were acquired through a reverse merger.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.



6. Introduction to MTS

MTS Health Partners Overview

Investment Banking

- > **Privately owned, independent firm, founded in 1999**
- > **Aligned strategic and financial advisory services to healthcare companies of all sizes, from global corporations to venture-backed businesses**
- > **Extensive experience across a broad range of client and transaction types**
 - Public and private; for-profit and not-for-profit
 - Mergers and acquisitions, restructurings, private placements, IPOs, structured debt financings and general strategic advice
- > **Partners averaging 20 years of healthcare experience**
- > **Offices in New York, San Francisco and Tokyo**

Life Sciences

- > Pharmaceuticals
- > Specialty Pharma
- > Generics
- > Biotechnology
- > Orphan / Rare Disease
- > Medical Devices / Diagnostics

Healthcare Services

- > Managed Care
- > Hospitals/Outsourced Services
- > PBMs & Pharmacy Services
- > Dialysis
- > Post-Acute Facilities (SNF, IRF, LTACH)
- > Home Healthcare/Hospice
- > Healthcare Technology
- > Clinical Laboratories
- > Healthcare Distribution/Supply
- > Pharma Services

Advantages of a Partnership with MTS Advisory Team

Bulge Bracket Capabilities with a Boutique Approach

Distinguished by experienced, attentive and independent counsel in the context of long-term relationships



Aligned

- > Economics – compensation model that transcends annual Wall Street bonus cycle
- > Culture – private equity mentality allows for **investor-focused perspective**
- > “Success” – defined through **achievement of client goals** rather than mere transaction execution

Independent

- > **Stability** of franchise and execution in turbulent banking environment
- > **Unencumbered by balance sheet conflicts** or commoditized financing solutions
- > Advisory team **solely focused on meeting client objectives** without impact from other parts of the organization

Attentive

- > **Boutique environment** – ensures personal commitment and focus
- > **Team of over 40 professionals**, larger than many bulge-bracket healthcare teams
- > **Staffed, resourced similarly to bulge-bracket banks**

Long-Term Partnership

- > **Long-term relationships** rather than short-term transactions
- > Translates to **unbiased and objective** evaluation and advice

Experienced

- > **Senior personnel** – decades of healthcare-focused banking experience
- > **Extensive** strategic, operational, financial and capital markets expertise
- > **Creative solutions** rather than the “standard” banker playbook

Healthcare-Focused

- > Unparalleled network provides **broadest reach** of any healthcare advisor
- > **In-depth knowledge** of healthcare industry, trends, transactions, decision-makers and their personalities

Large Firm Scale with Boutique Focus

Senior Life Sciences Team

Mark Epstein Managing Partner

Completed over 100 private financings for clients raising over \$5 billion in private capital

Managing Director / Co-Head Bank of America Private Equity Placements

Prior to BofA, VP and co-head of Direct Private Equity Placements at Merrill Lynch

Andrew Weisenfeld Managing Partner

Has worked on approximately \$50 billion in M&A deal volume across a range of advisory transactions

Managing Director/ Co-Head of BofA Life Sciences Investment Banking

Prior to BofA, Managing Director and Head of Healthcare M&A at JPMorgan

Peter Collum Partner

Has worked on over \$20 billion in M&A deal volume

Director, Bank of America Healthcare Investment Banking from 2003-2009

Prior to BofA, Technical Development Engineer at Hoffmann-La Roche

Andrew Fineberg Partner

Prior to MTS, Andrew led the Financing Group at Torrey Partners, LLC, a boutique investment bank

Prior to Torrey Partners, Andrew worked at Cowen and Company, a global investment bank as Vice President in the Private Placement Group

Kazuki Kusaka Partner

Prior to joining MTS, Mr. Kusaka led the healthcare practice for Lazard in Japan for 10 years

Prior to Lazard, Mr. Kusaka was a Managing Director and the head of Asia Healthcare Group at Lehman Brothers from 2000 to 2007

Soojin Kwon Partner

Has worked on over \$14 billion in equity and M&A deal volume

Director, BofA Healthcare Equity Capital Markets

Prior to BofA, Equity Research Analyst at Merlin Biomed Asset Management and UBS, respectively

David Low Partner

Previously, a partner in Lazard's Life Sciences Group, which he joined in 2002

Long career in advising on M&A and equity financing strategies for life sciences companies globally

Worked at Lehman Brothers from 1987-1996 and JPMorgan from 1996 through July 2002

Ravi Mehrotra Partner

Has nearly two decades of healthcare equity research experience

Previously, at Credit Suisse for 11 years and most recently held the title Global Head of Biotechnology Equity Research

Worked at Cowen 1999-2004 as European head of Biotechnology and Deutsche bank 1997-1999

Entire MTS Team Solely Focused on the Global Healthcare Industry

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Partners/Senior Advisors

9

Directors / Vice Presidents

24

Associates / Analysts



Appendix

Valuation of Performance Split by Lead Asset Phase at IPO

Classes of 2015 – H1 2018

	# of Companies	(%)	Avg Raise	Avg Raise to Prior Cash (%)	Cumulative IPO Valuation	(%)	Avg Valuation / Company @ IPO	Performance Since IPO
Class of 2018								
Early-Stage								
Mid-Stage								
Late-Stage								
Total								
Class of 2017								
Early-Stage								
Mid-Stage								
Late-Stage								
Total								
Class of 2016								
Early-Stage								
Mid-Stage								
Late-Stage								
Total								
Class of 2015								
Early-Stage								
Mid-Stage								
Late-Stage								
Total								

Please contact Ravi Mehrotra for the full report
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Note(s): All \$ in mm; Early-Stage = Preclinical and Phase I assets; Mid-Stage = Phase II assets; Late-Stage = Phase III assets and onwards. PM refers to post-money valuations.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Valuation of Performance Split by Lead Asset Phase at IPO

Classes of 2012 – 2014

	# of Companies	(%)	Avg Raise	Avg Raise to Prior Cash (%)	Cumulative IPO Valuation	(%)	Avg Valuation / Company @ IPO	Performance Since IPO
Class of 2014								
Early-Stage								
Mid-Stage								
Late-Stage								
Total								
Class of 2013								
Early-Stage								
Mid-Stage								
Late-Stage								
Total								
Class of 2012								
Early-Stage								
Mid-Stage								
Late-Stage								
Total								

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Note(s): All \$ in mm; Early-Stage = Preclinical and Phase I assets; Mid-Stage = Phase II assets; Late-Stage = Phase III assets and onwards. PM refers to post-money valuations.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Valuation of Performance Split by Modality

Classes of 2015 – H1 2018

	# of Companies	(%)	Avg Raise	Avg Raise to Prior Cash (%)	Cumulative IPO Valuation	(%)	Avg Valuation / Company @ IPO	Performance Since IPO
Class of 2018								
Small Molecule								
Biologic								
Gene Therapy								
Other								
Total								
Class of 2017								
Small Molecule								
Biologic								
Gene Therapy								
Other								
Total								
Class of 2016								
Small Molecule								
Biologic								
Gene Therapy								
Other								
Total								
Class of 2015								
Small Molecule								
Biologic								
Gene Therapy								
Other								
Total	48		\$109	144%	\$25,396		\$529	13%

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Note(s): All \$ in mm; Other comprises of steroids, vaccines and non-traditional biotech products.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.

Valuation of Performance Split by Modality

Classes of 2012 – 2014

	# of Companies	(%)	Avg Raise	Avg Raise to Prior Cash (%)	Cumulative IPO Valuation	(%)	Avg Valuation / Company @ IPO	Performance Since IPO
Class of 2014								
Small Molecule								
Biologic								
Gene Therapy								
Other								
Total								
Class of 2013								
Small Molecule								
Biologic								
Gene Therapy								
Other								
Total								
Class of 2012								
Small Molecule								
Biologic								
Gene Therapy								
Other								
Total								

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Note: All \$ in mm; Other comprises of steroids, vaccines and non-traditional biotech products.
Source(s): MTS, Dealogic and CapitalIQ, as of 06/30/2018.



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