



Conference Presentation  
2016 PMSA - Deal Valuations



*Changing of the Guard in Business Development*

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## Changing of the Guard in Business Development

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# Our Discussion Today

## Agenda

1. Signs pointing toward a Tipping Point in Valuations
2. Business & Market Drivers of Deal Valuation
3. Exploring a Predictive Deal Premium Model

### Deal Segments

1. Explore the specific conditions that result in predictable and vastly different valuation premiums

### Sell-side

1. Understand basis on which a premium will be paid
2. Anticipate what that premium will be
3. Better target potential buyers
4. Better deal negotiation tactics

### Buy-side

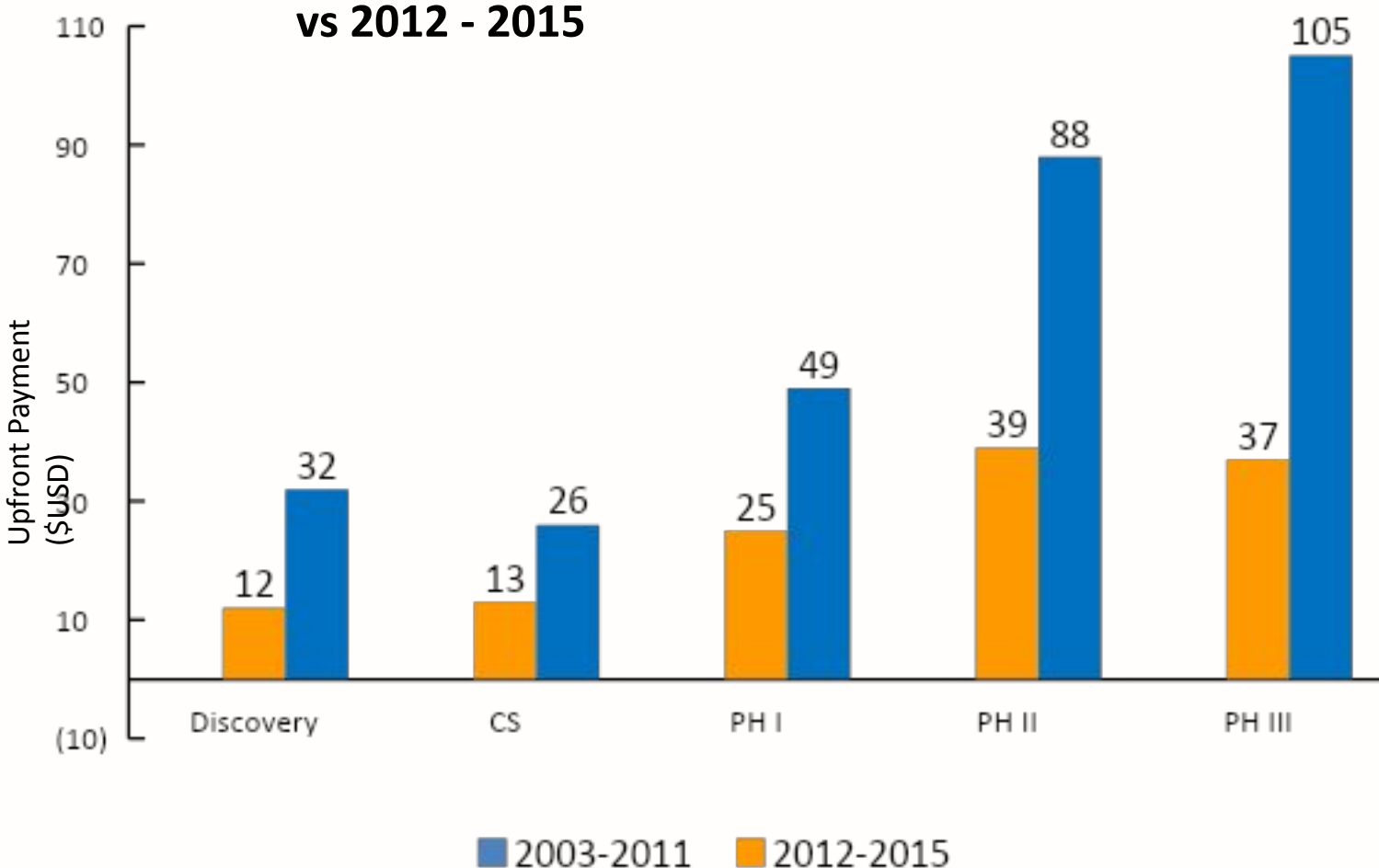
1. Perspective of what premium might be paid by others (so not locked out or lose)
2. Accommodate differences in company condition with deal structure



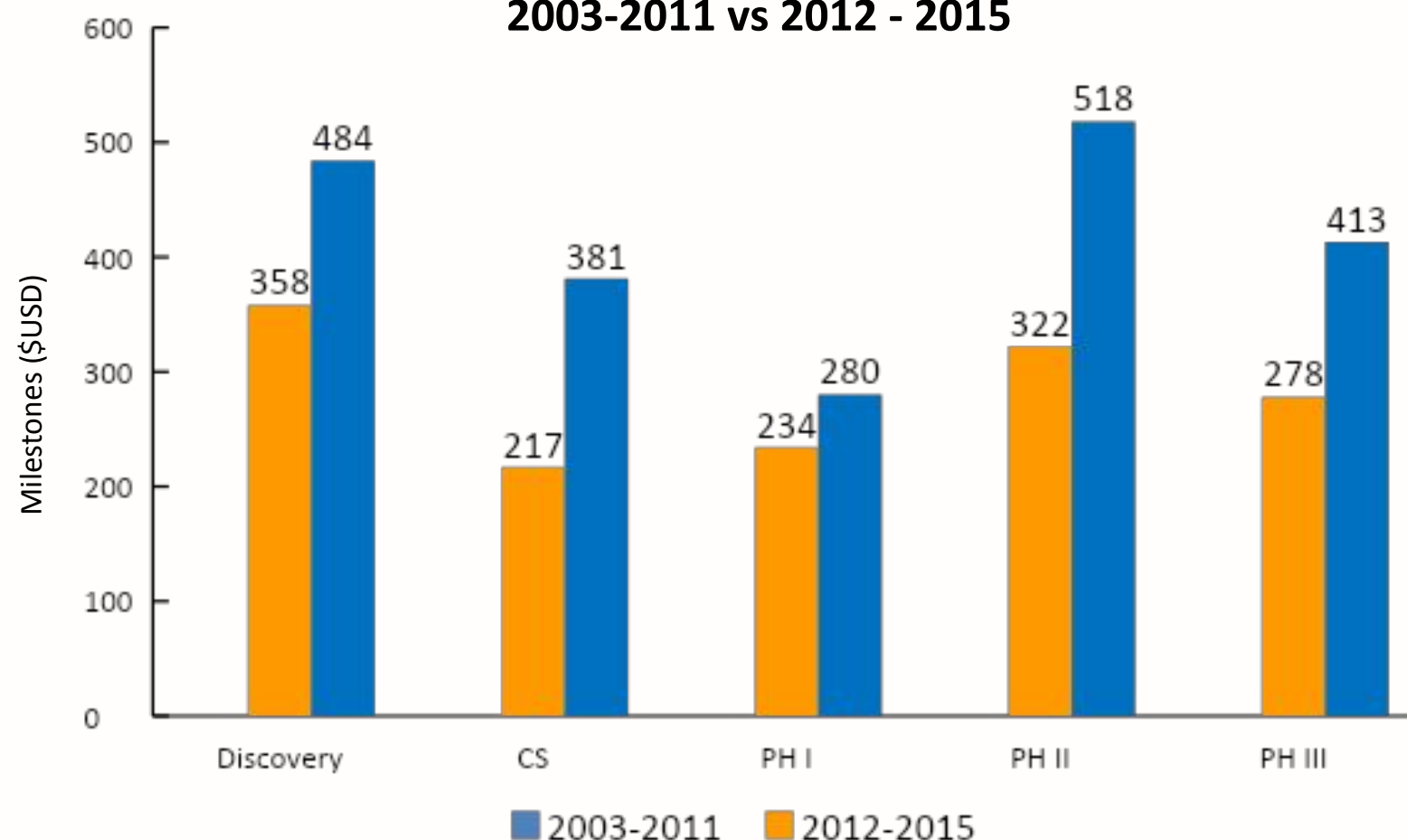
# External BD

## Upfront & milestone payments have increased across all stages

Mean Upfront Payment 2003-2011 vs 2012 - 2015



Mean Potential Milestone Payments 2003-2011 vs 2012 - 2015



Significant recent deals (2012-2015) include Sanofi license agreement with Hanmi for long acting diabetes treatments (PH II Deal, \$437M Upfront, \$3.8B in potential milestones); Pfizer strategic Immuno Oncology collaboration with Cellectis (Discovery, \$80M Upfront, \$2.8B in potential milestones); Cellgene license agreement with Nogra Pharma for Crohn's Disease treatment (PH II, \$710M Upfront, \$1.9B in potential milestones); Ablynx Drug Discovery collaboration with Merck (\$27M upfront, \$2.3B in potential milestones)

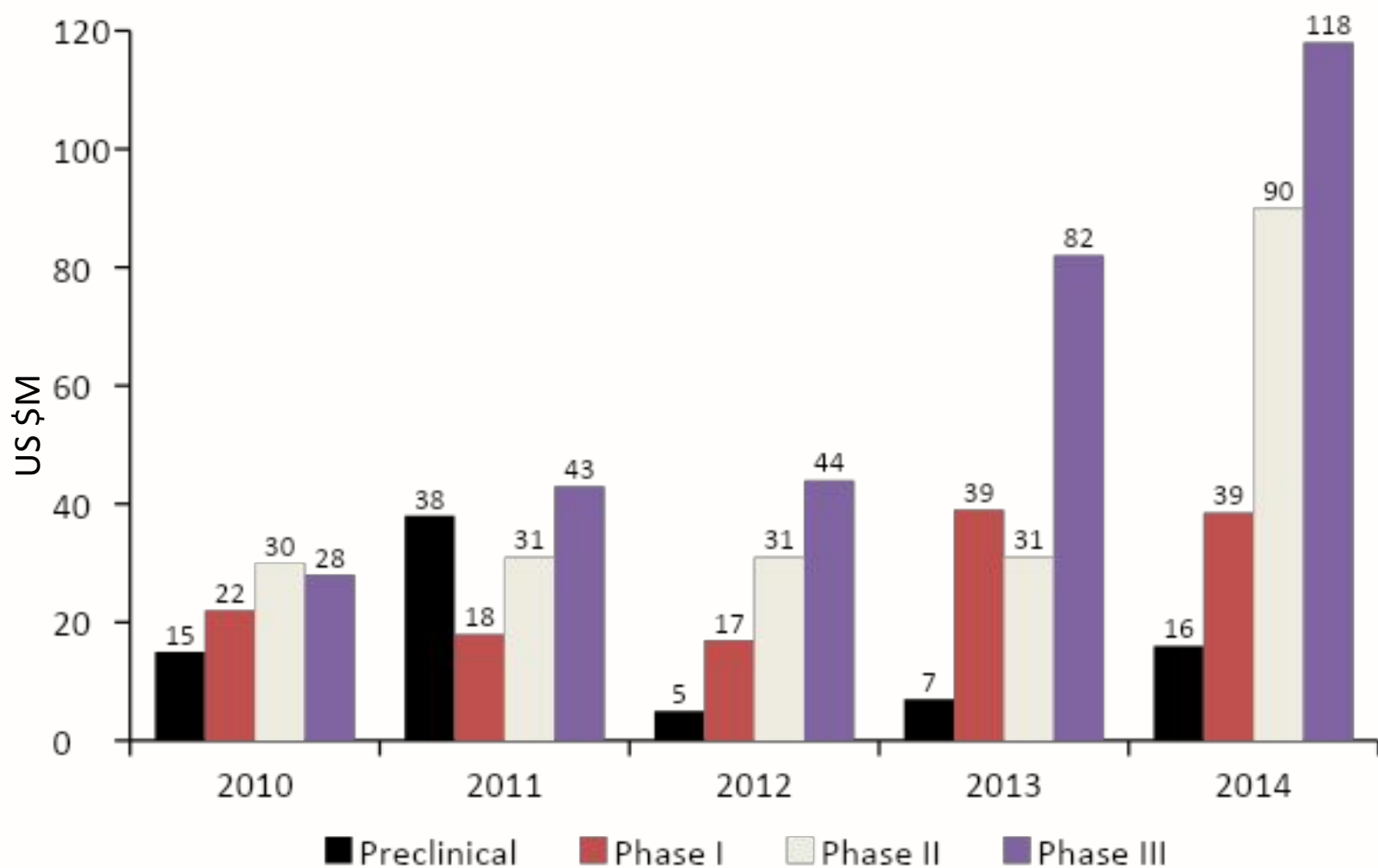


\* Data sourced from Pharmadeals for deals published with upfront & milestone payment

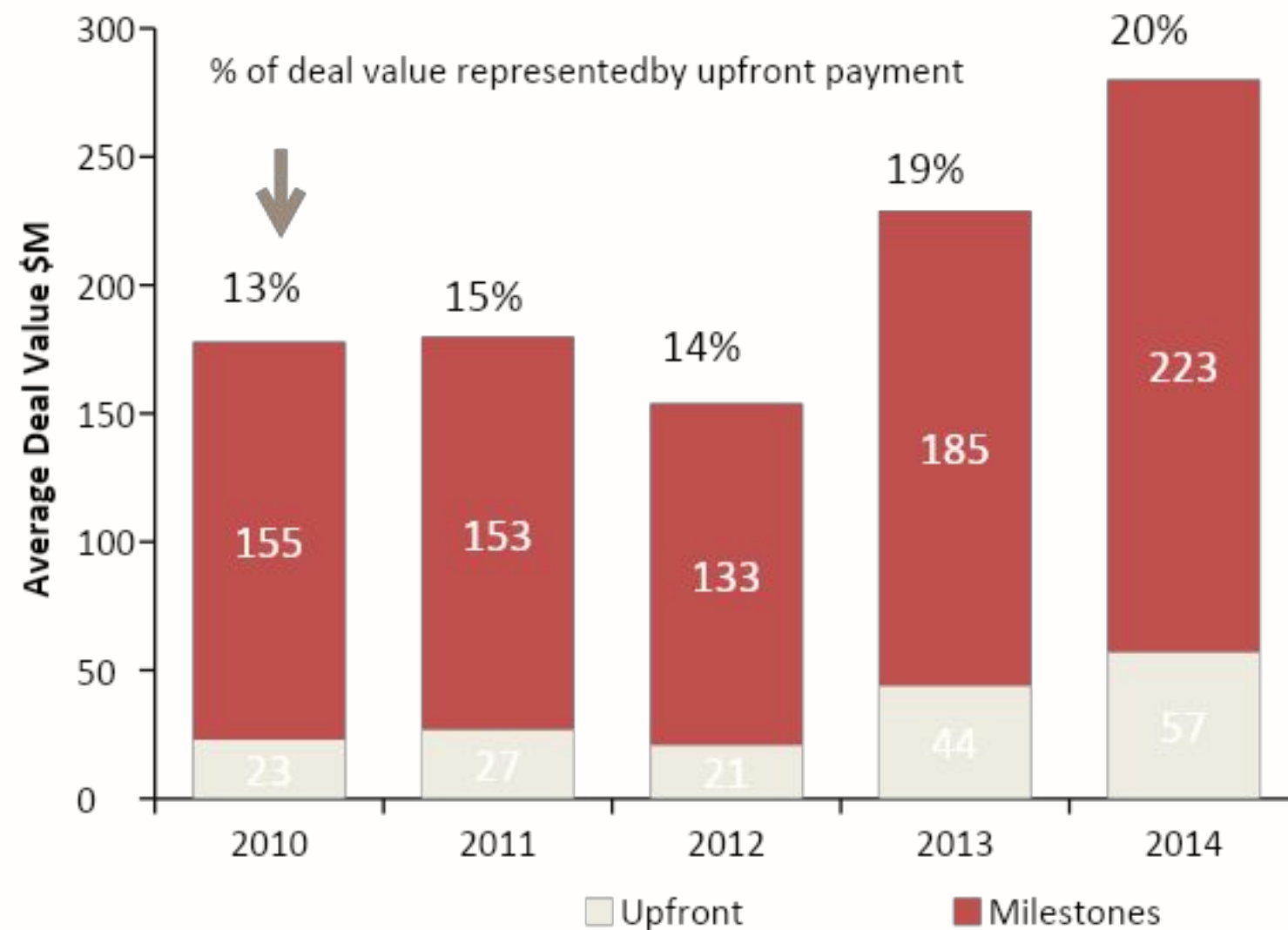
# External BD

## Upfront payments for clinical assets have $\square$ substantially

Mean Upfront Payment For Licensing Deals By Stage (2010 – 2014)



\*Breakdown of Average Deal Value Into Upfronts vs. Milestones



\*IMS  
PharmaDeals

\*Deal value includes

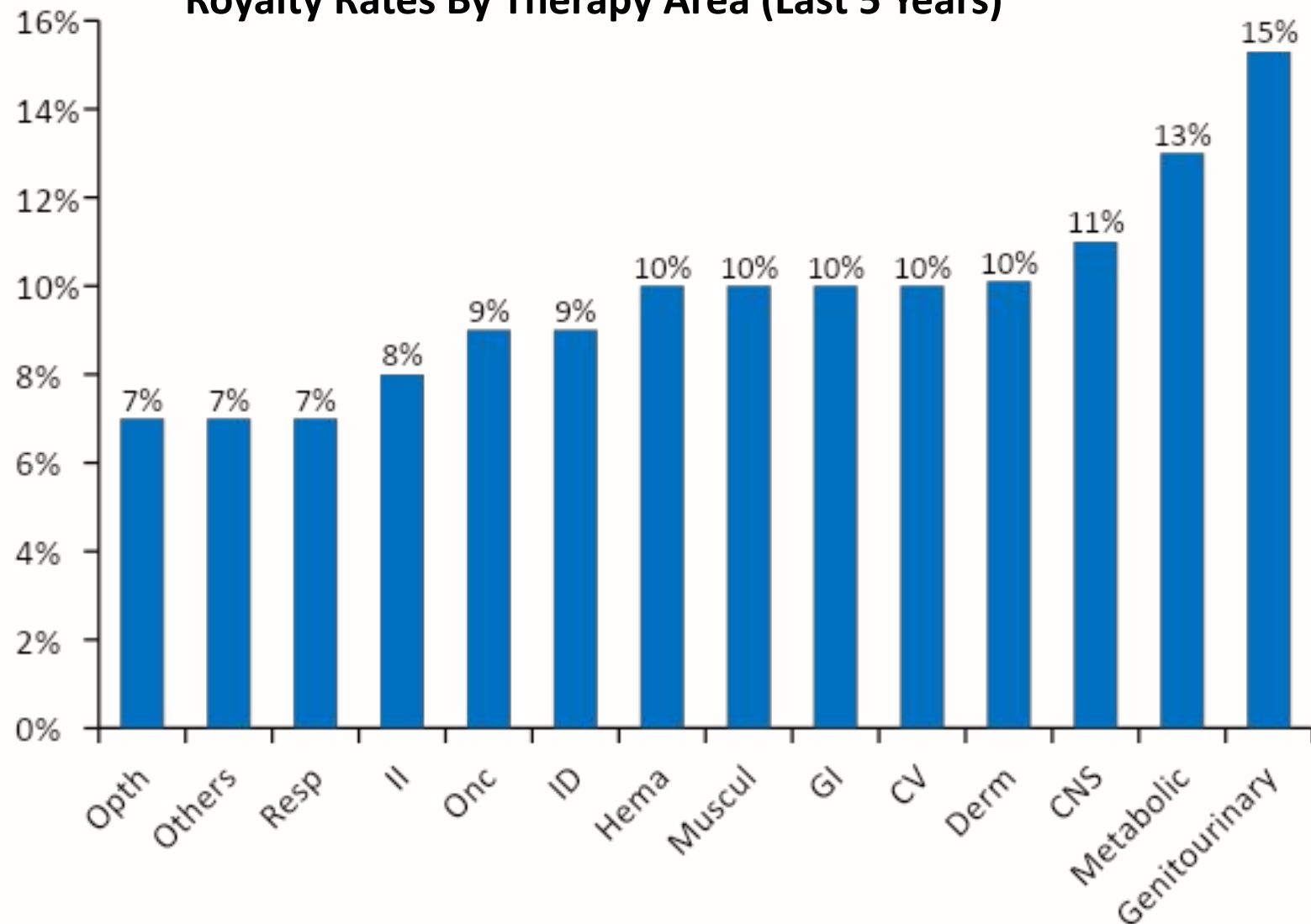
Mean upfront payments for licensing deals rose further in 2014 to over \$100M. Four of the top 10 upfront payments for partnering deals in 2014 were for PH III licensing deals (\$295M upfront Pfizer in-licensed from OPKO for HGH and the largest being AZ in-license from FibroGen for \$350M for FG 4592). Upfront payments as a percentage of the total deal value also continue to rise to ~20% in 2014



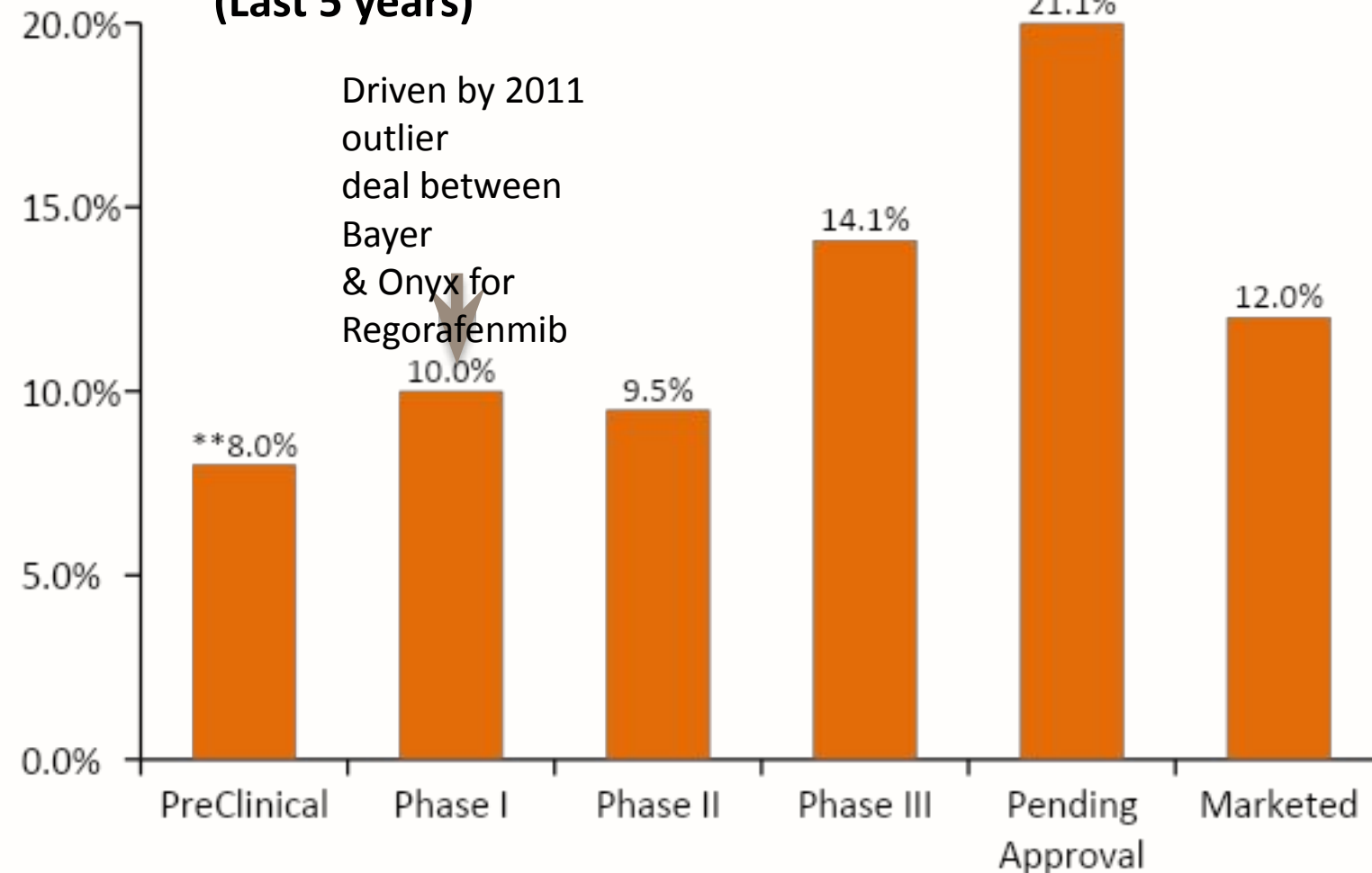
# External BD

increase as an asset progresses...

Royalty Rates By Therapy Area (Last 5 Years)



Royalty Rates By Phase At Deal Signing (Last 5 years)



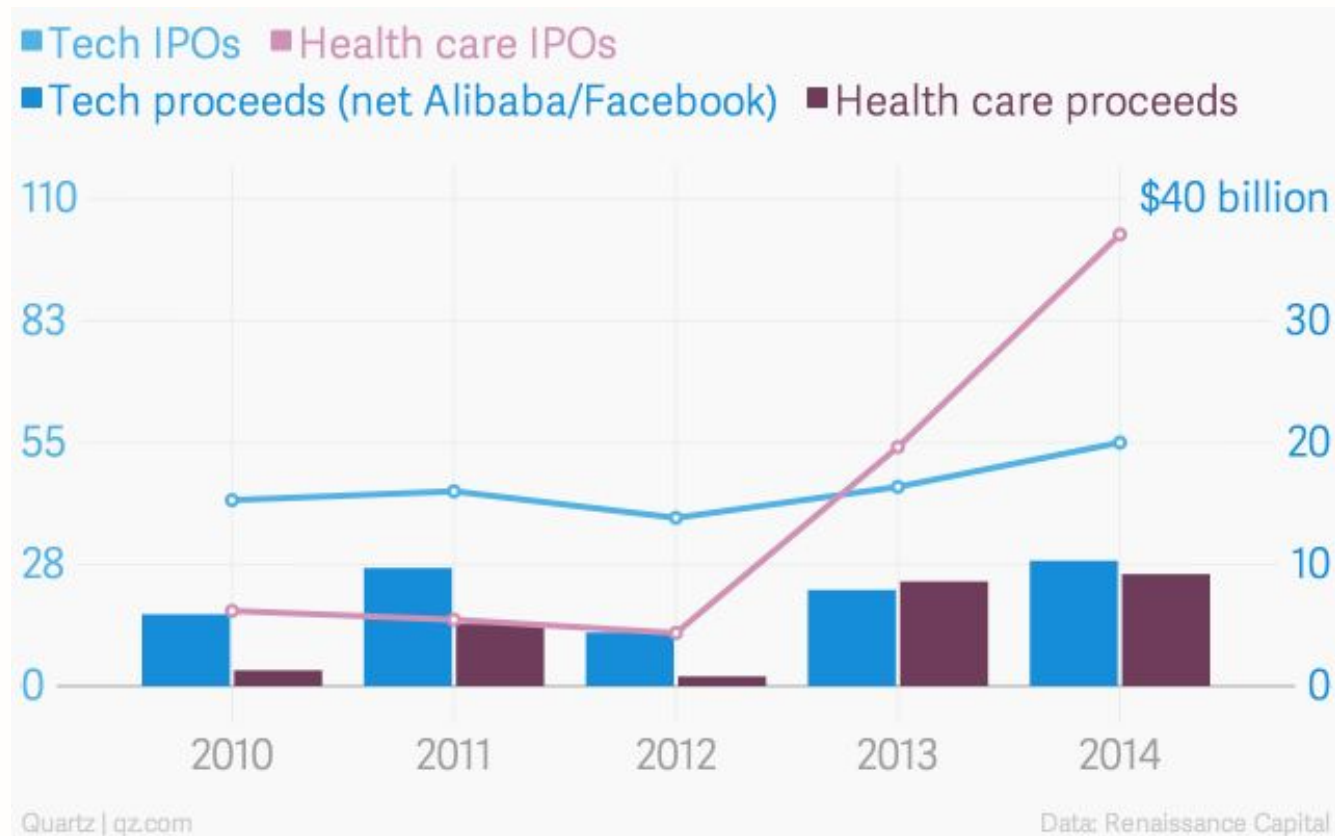
Royalty rates by phase of development, as expected, show an increase in royalty rates as an asset progresses in development as risk is discharged. Pre-clinical deals had royalty rates ranging from a low of 1% to a high of 25%. Mean royalty rates by TA ranged from a low of 7.3% for Ophthalmology to a peak of 15.3% for genitourinary disorders. Important to look at deals by Phase by TA (shows as backup slide)



\*Left graph based on MedTrack review of >400 Deals; right graph based on MedTrack data from last 5

# External BD

# IPO volumes since 2013 & returns made deals □ expensive



Of 102 health-care IPOs in the United States alone in 2014, 71 of which were biotechs—one in four of all US IPOs. Average return on last year’s biotech IPOs was 13% on the first day, and 21% through the end of the year, which made them best-performing segment of the IPO market.

Biotechnology NASDAQ index has increased by 44.1% the past year and 389% the past 5 years, **BUT, is down 35% since 4Q15 and privately held companies are pulling planned IPOs and by end of 2016 may be more open to deals with pharma at supportable valuations**



# External BD

## Do discounted cash flows even matter anymore?

	-1	0	1	2	3	4	5	6	7	8	9	10
Clin Dev	-200	-200										
Sales			20	40	100	200	250	250	250	250	100	25
CoGS			-2	-4	-10	-20	-25	-25	-25	-25	-10	-2.5
SGA			-10	-10	-10	-10	-10	-10	-10	-10	-5	0
Cash Flows	-200	-200	8	26	80	170	215	215	215	215	85	22.5

PV of DCF at 4%      \$538.28  
 PV of DCF at 0%      \$851.50  
 PV of DCF at -4%    \$1,317.50

Theoretically, if a dollar held today is worth less than a dollar held tomorrow, that investor should rid herself of those dollars as quickly as possible, deal value be damned!!!

The perverse effects of negative interest rates and our inability to make sense of them..



Section - 2

# The times they are a-changin'



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# Value Drivers

Dealmakers believe values are reversing trend & going lower

## More typical drivers of valuation growth

*Demographic tailwinds*

*Significant innovation from smaller players*

*Big pharma need*

*Availability and cost of capital*

*Well understood pricing/access/reimbursement environment*

*Option for smaller originator to launch*

*Ability for smaller originators to launch is much reduced*

*Tighter capital environment for many originator companies*

## Recent drivers of valuation correction

Socioeconomic and budgetary headwinds

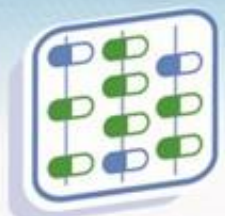
*US leaning to serious cost containment measures*

*US election year uncertainty*

Increased competition in high value therapy areas

Challenges in emerging markets

*For all but the most important new medicines, a buyers market is foreseen*



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# Tight Money

Development stage companies face increased funding hurdles

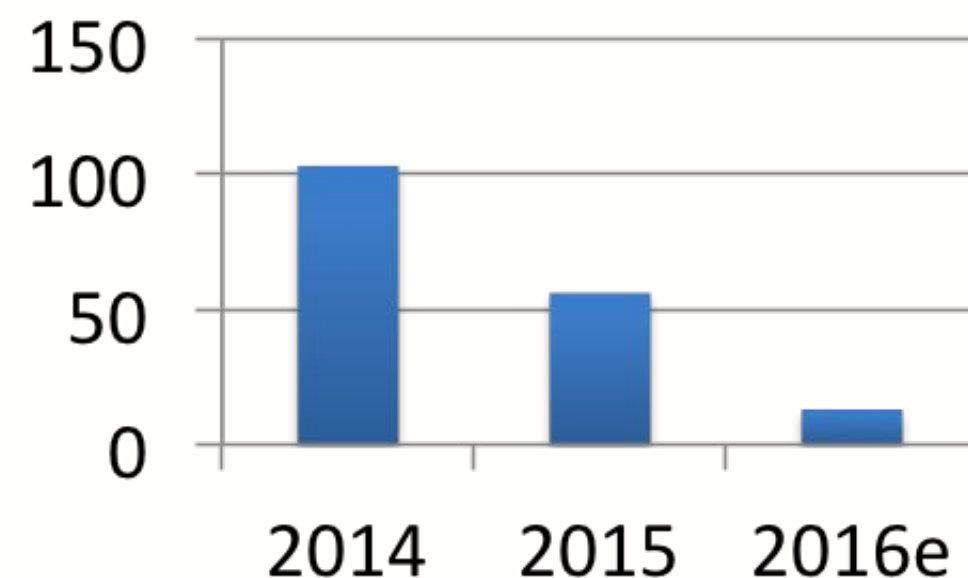
More  
Difficult  
Funding

IPO window is largely shut for now

Shares of recent IPOs are generally at very low levels

Debt financing difficult to obtain at any rate

Life Science IPOs



- Frothiness has gone off deal valuations
- Making a deal with big pharma may be only/best option for monetizing asset values

# Loose Money

Money has never been cheaper... if it can be accessed

## Key Global Central Bank Rates (short-term)

- US: □ barely above 0%
- EU: □ negative
- Japan: □ negative

Unprecedented amount of liquidity seeking opportunities

Private equity & hedge funds offering more advantageous terms on ring fenced assets

More Sources for Funding

- The lending environment is in uncharted territory
- This may be the “new normal” for the mid-term

# Valuation

The implications of the current circumstance could be curious

- Are crazy high deal valuations rational?
- With reduced rNPV and fewer alternatives for the sell-side, we'd anticipate lower deal valuations
- Rational deal structure is affected

## Low Interest Rates (ZIRP, NIRP)

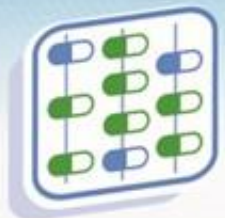
- Theoretically Buy-side could be paid to borrow money and buy assets with Infinite funding
- However, credit agencies and risk tolerance would likely intervene
- Is DCF dead?

## Biz Conditions & Capital Access

- Interest rates at the zero-bound symptomatic of a general malaise in capital and R&D spending
- rIRR below the cost of capital could imply a possible reduction in R&D spending
- However, the affect on PE multiple would be negative and would negate such strategies

Section - 3

# LICENSING VALUATIONS & DRIVERS



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# Case Study

## Estimating deal terms for multiple parties

- Modifying Company 1 model with assumed Company 2 inputs to estimate key deal metrics
  - 50% higher net sales (approximate blend of FR net sales and Company 2 net sales)
  - 12.5% tax rate
- Company 1 deal terms:
  - \$125 million up front
  - Assume \$100 million additional milestone payments are paid
  - Assume 25% lower promotional costs than Company 2 due to synergy

	Company 2 Model	Company 2 Model 50% Higher Net Sales	Company 2 Model 50% Higher Net Sales Using 12.5% Tax	Company 2 Model 50% Higher Net Sales Using 12.5% Tax Company 1 Deal Terms	Model 50% Higher Net Sales Using 12.5% Tax Company 1 Deal Terms 25% Lower Cost for Promotion
<b>NPV</b>					
eNPV excluding Deal Terms	\$269,741,759	\$521,698,676	\$707,730,761	\$707,730,761	\$762,974,247
NPV excluding Deal Terms	\$463,834,406	\$857,517,099	\$1,163,298,391	\$1,163,298,391	\$1,247,042,033
NPV including Deal Terms	\$200,829,834	\$538,630,408	\$782,284,310	\$709,049,010	\$792,792,652
<b>After making deal:</b>					
With Taxes					
eNPV for Buyer	\$44,563,589	\$260,755,950	\$407,026,507	\$353,199,049	\$408,442,536
eNPV for Seller	\$178,572,739	\$207,892,389	\$282,024,559	\$338,082,103	\$338,082,103
<b>Buyer to Seller Ratio</b>	17%	50%	58%	50%	54%
<b>IRR (from annual data)</b>	17.6%	26.5%	29.8%	27.7%	29.7%
<b>eIRR (from annual data)</b>	12.3%	20.2%	23.2%	21.2%	22.8%



# Research

Our goal is to disaggregate the drivers of deal valuation

## Goals

- Academic
- Sell-side
- Buy-side

1. Objectively quantify the level of deal values with respect to their costs and expected returns
2. Understand the conditions and scenarios that drive valuations
3. Create a model for predicting valuations under common conditions
4. Provide insights to deal players that inform strategy & tactics



# Methodology

Deal values are matched with expected product performance

## 1 Build Multivariate Omnibus Data Set of Deals

- Recent deals
  - Deal Valuation
  - Structure
- Consensus NPV
  - Objective third party opinion of go-forward product costs and revenues

### Data Sources

1. Bloomberg
2. Thomson Reuters
3. Foster Rosenblatt
4. Symphony Health
5. IMS Health
6. Evaluate Pharma

#### Deals

- All asset level (no M&A)
- 2013-2015
- N = 200
- Preclinical - Phase III
- US or global rights

#### Analyst NPVs

- Sell-side cost, revenue and NPV

#### Therapy Areas (most prevalent)

- Oncology
- Neuro / Mental / Pain
- Immunology
- CV/ Endocrine / Metabolic
- Gastrointestinal
- Dermatology
- Respiratory
- Hematology



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# Methodology

## 2 Methodological Approach

- Statistical Analysis Applied at Two Levels
  - General Analysis
    - The general analysis assumed that all deals are driven similarly
    - Using multiple regression, the potential drivers are regressed against the premium paid to understand their influence
  - Segmentation Deep Dive
    - This subsequent analysis hypothesizes that there are potentially different deal types and that drivers may be different across deal types (identified using k-means analysis)
    - The potential drivers for each segment are then regressed against the premium for each segment

# Methodology

## Multiple regression indicating drivers of deal valuation

### 3 Build Multiple Regression Predictive Models

- Multiple Regression was run on full data set – results were obtained for the full data set (n=200)
- Subsequently, using a simple k-means segmentation approach, two deal-type segments were identified
  - Inline Segment (n=47): Bidder characteristics include existing product/lines in same therapy area with patent expiry within 3 years, would suffer catastrophic loss if asset was sold to competitor and R&D exists in same therapy class
  - Greenfield Segment (n=153): Bidders who do not have patent expiry existing product/lines in same therapy area, will not suffer catastrophic loss if sold to competitor
- The potential drivers for each segment are then regressed against the premium for each segment



# Variables

## Portfolio strategy & financial metric variables were tested

(For a bidder with an existing in-line product in the same therapy area) Product patent expiry within 3 years	(For a bidder with an existing in-line product in the same therapy area) Catastrophic loss of dominant market share if product is sold to competitor	Existence of other in-line products in the same therapy area	Existence of R&D activity in the same therapy area	Blockbuster with +\$1B in sales and +10% of US sales going off patent within 3 years	First/early entrant into a therapy area with no disease modifying agents	First/early entrant into a transformational new platform technology	Reduction to stock price of +15% over last 8 quarters	Corporate cost of capital in lowest 1/3 of industry
Portfolio Driven	Portfolio Driven	Portfolio Driven	Portfolio Driven	Portfolio Driven	Portfolio Driven	Portfolio Driven	Financially Driven	Financially Driven
P1	P2	P3	P4	P5	P6	P7	F1	F2
2	0	6	21	10	0	0	24	6

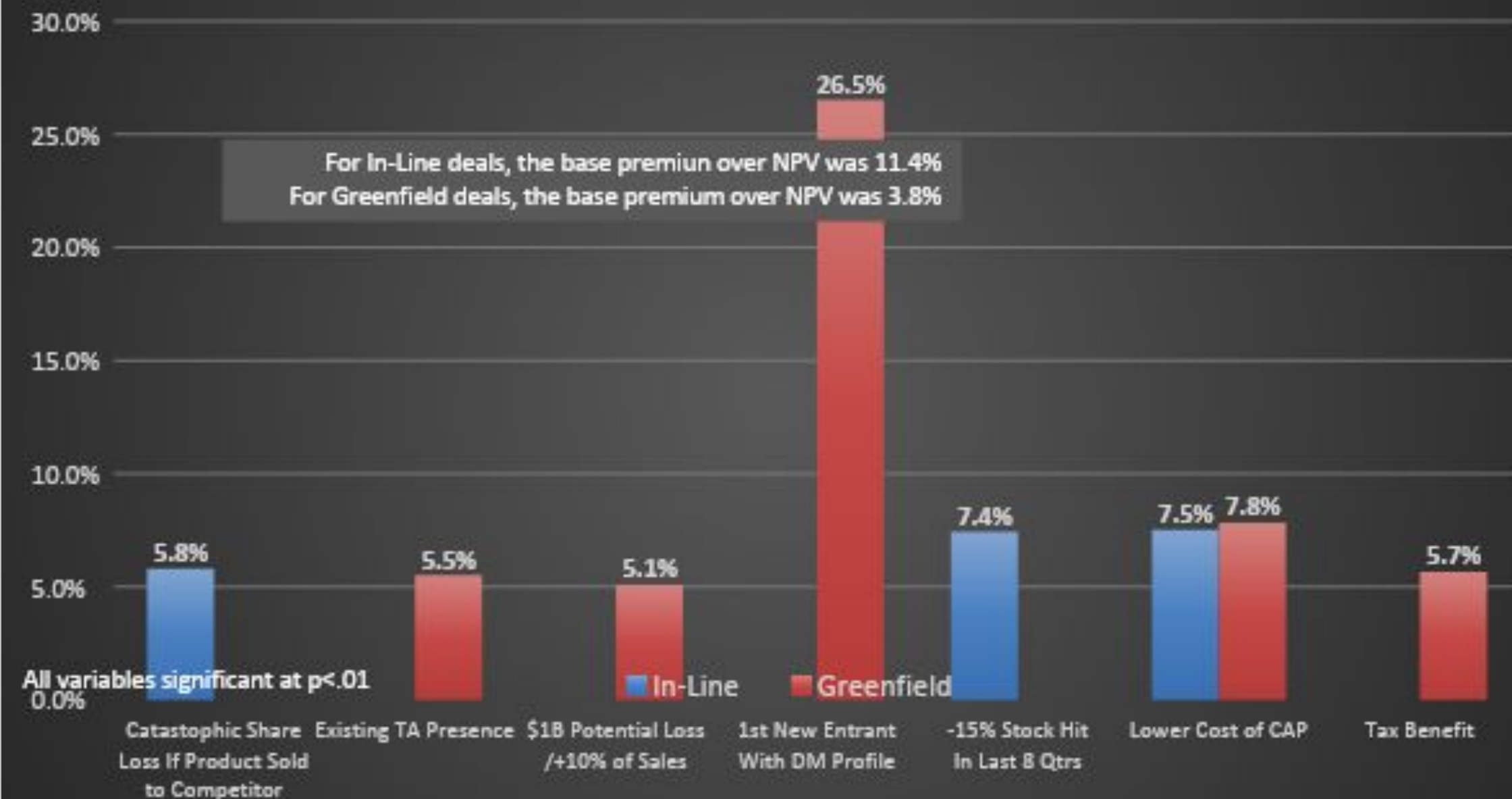
Note: Many other variables were considered but ultimately rejected due to statistical results



# Individual

## Highest Level Analysis Deal Premium

Individual Variable Contribution  
to Deal Premium

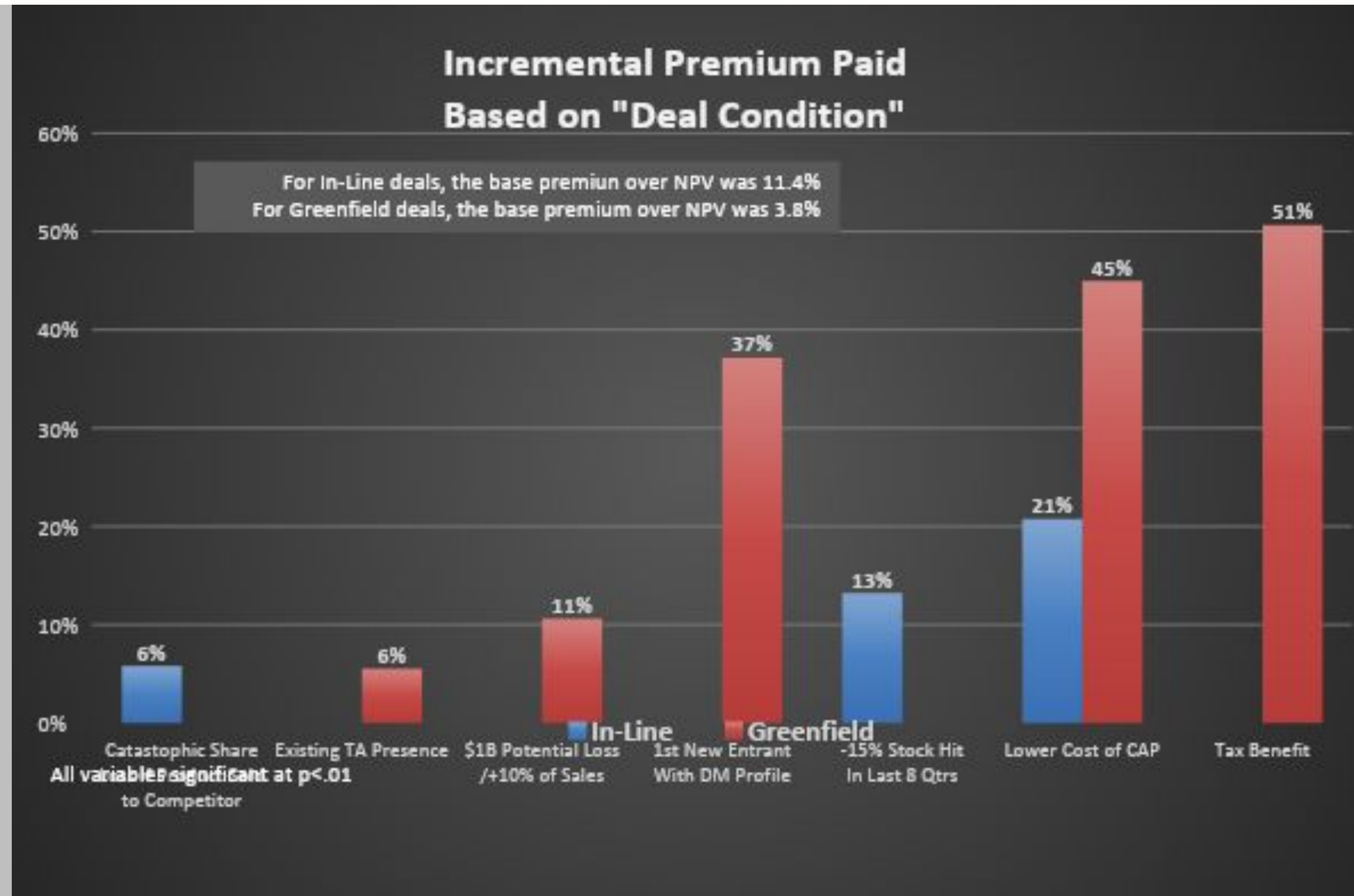


- “In-Line” Deals
  - 3 drivers
- “Greenfield” Deals
  - 5 drivers
  - Both the highest (1<sup>st</sup> Entrant with DM Profile) and lowest (Existing In-line TA presence) drivers of valuation
- Only one variable (lower cost of capital) is significant in both deal types

# Cumulative

## Highest Level Analysis Cumulative Effect

- “In-Line” Deals
  - Cumulative effect could reach 32\*%
- “Greenfield” Deals
  - Cumulative effect could reach 54\*% (driven largely by 1<sup>st</sup> Entrant with DM Profile)



# Key Drivers\*

Financial variables drive “In-Line” deals; Portfolio variables drive “Greenfield” deals

	In Line	Greenfield
Largest Driver	Cost of Capital 7.5%	1st Entrant 25.9%
Lesser Important	Catastrophic Share Loss 5.8%	\$1M Blockbuster Loss 5.1%

- In-line range is quite small (5.8% to 7.5%)
- Greenfield range is large (5.1% to 25.9%) (1<sup>st</sup> entrant with disease modifying profile)
- Most variables are 5-8% premium with the exception of 1<sup>st</sup> entrant with DM profile

\* All variables were statistically significant (p<.01) & drive valuation premium



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# In-line Segment Predictive Model

	INT	Catastrophic Share Loss	Stock Hit	Cost of Cap.	Average In-Line Premium
COEFFICIENT	0.114	0.058	0.074	0.075	
MEAN	1	0.60	0.36	0.70	
Estimated Impact	0.114	0.035	0.027	0.053	22.9%

- Ave premium paid for an in-line was 22.9% with the two financial variables contributing considerable more than the portfolio variables

	INT	Catastrophic Share Loss	Stock Hit	Cost of Cap.	Expected In-Line Premium Under Conditions of P2, F1, F2
COEFFICIENT	0.114	0.058	0.074	0.075	
VALUE	1	1.00	1.00	1.00	
Estimated Impact	0.114	0.058	0.074	0.075	32.2%

- The maximum deal premium of 32.2% could be achieved if all conditions are present



# In-line Segment Predictive Model

When Share Loss is present, the expected premium is 17.2%

In-Line Portfolio	INT	Catastrophic Share Loss	Stock Hit	Cost of Capital	Expected Premium When Only The Portfolio Condition Is Met
COEFFICIENT	0.114	0.058	0.074	0.075	
VALUE	1	1.00	0.00	0.00	
Estimated Impact	0.114	0.058	0.000	0.000	17.2%

When both financial conditions are present the expected deal premium is 26.4%

In-Line Financial	INT	Catastrophic Share Loss	Stock Hit	Cost of Capital	Expected Premium When Both Financial Conditions Are Met
COEFFICIENT	0.114	0.058	0.074	0.075	
VALUE	1	0.00	1.00	1.00	
Estimated Impact	0.114	0.000	0.074	0.075	26.4%





# Greenfield Segment Predictive Model

	INT	In-line TA Presence	\$1B Blockbuster Loss	1 <sup>st</sup> Entrant – DM Profile	Cost of Capital	Tax Benefit	Average Greenfield Premium
COEFFICIENT	0.038	0.053	0.052	0.259	0.083	0.057	
MEAN	1	0.26	0.29	0.03	0.33	0.11	
Estimated Impact	0.038	0.014	0.015	0.008	0.028	0.006	11.0%

- Ave premium paid for an Greenfield deal was 11% with biggest contributor being Cost of Capital as it was present in 33% of deals representing 8.3% deal premium

	INT	In-line TA Presence	\$1B Blockbuster Loss	1 <sup>st</sup> Entrant – DM Profile	Cost of Capital	Tax Benefit	Expected Greenfield Premium When All Conditions Exist
COEFFICIENT	0.038	0.053	0.0512	0.259	0.083	0.057	
VALUE	1	1.00	1.00	1.00	1.00	1.00	
Estimated Impact	0.038	0.053	0.052	0.259	0.083	0.057	54.2%

- When present, 1<sup>st</sup> Entrant with DM profile is by far the most significant contributor, but was only in less than 3% of deals

# Greenfield Segment Predictive Model

When the 3 portfolio (only) conditions are met, the expected premium is 40.2%

Greenfield Portfolio	INT	In-line TA Presence	\$1B Blockbuster Loss	1 <sup>st</sup> Entrant – DM Profile	Cost of Capital	Tax Benefit	Expected Premium When Only The Portfolio Condition Is Met
COEFFICIENT	0.038	0.053	0.051	0.259	0.083	0.057	
VALUE	1	1.00	1.00	1.00	0.00	0.00	
Est. Impact	0.038	0.053	0.052	0.259	0.000	0.000	40.2%

When both (only) financial conditions are present the expected premium is 17.8%

Greenfield Financial	INT	In-line TA Presence	\$1B Blockbuster Loss	1 <sup>st</sup> Entrant – DM Profile	Cost of Capital	Tax Benefit	Expected Premium When Both Financial Conditions Are Met
COEFFICIENT	0.038	0.053	0.052	0.259	0.083	0.057	
VALUE	1	0.00	0.00	0.00	1.00	1.00	
Est. Impact	0.038	0.000	0.000	0.000	0.083	0.057	17.8%



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# Quartile Deal Premium Data

Q4 is driven by significant new product opportunities that transform markets

Quartile	Ave. Premium	Range
Quartile 4	30%	24%-39%
Quartile 3	18%	14%-23%
Quartile 2	10%	5%-13%
Quartile 1	-2%	-21%-4%
Mean	14%	

Q1 is largely represented by moderate innovation and/or earlier stage platform technology deals



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# Quartile Deal Premium Data

## Quartile 4

- Min = 23%
- Max = 39% (Average Deal Premium: + 30%)
- 2/3 of these high premium deals had TA Presence/RD Presence
- 100% of the 1st Entry (P6) deals were Q4 deals
- 57% of deals driven by Catastrophic Share Loss were in the Q4 quartile
- 100% of deals driven by Catastrophic Share Loss were in the Q3/Q4 quartile
- 79% of deals with firms having a Lower Cost of Capital were in the Q4 and Q3 quartile (66/84)

## Quartile 1

- Min = -23%
- Max = 4% (Average Deal Premium: - 2.3%)
- 32% of all deals that where stock price was relevant were in Q1

**NONE** of the deals that where P2 (Catastrophic Share Loss) or P6,P7 (Innovative 1st) existed were in Q1

## For TA Presence (P3)

- The existence of a TA presence in a deal, is highly related to deal premium value
- When TA presence exists, the highest deal premiums are seen (due to presence, infrastructure, etc.)
- If you are selling an asset to a company with infrastructure, you can likely exact a deal premium



Summary

# SYNTHESIS & IMPLICATIONS



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# Summary

## Two Different Deal Types Are Driven By Different Conditions

- Our research discovered that there were two distinct segments (i.e. types of deals) that were driven very much by different variables, or business conditions

- “In-Line deals:” surprisingly premiums paid were much more substantially driven by *financial* variables (stock declines and lower cost of capital); In-line deal premiums were also impacted a potential catastrophic market share loss that would occur if a competitor “made the deal”

- “Greenfield deals,” premiums paid were much more the result of portfolio variables (impending loss of a major company product, 1st to Market entrants with DM profile)

# Summary

## Deal Premiums Are Different for “In-Line” and “Greenfield” Deals

- On average, significantly higher valuations for in-line (23%) deals are paid relative to “Greenfield” opportunities (11%); this may be due to the following conditions:
  - Sunk capital costs have been absorbed
  - The absence of traditional “barrier” operational start-up costs, HCP relationships, payer access, etc.
- While financial considerations for in-line deals command a higher premium, the single largest deal premium is paid for a 1<sup>st</sup> Entrant agent with a DM profile (26%)

# Summary

## Sellers/Buyers Can Use A Predictive Model To Inform Deal Premium

### For Asset Owners (Sell-Side)

- There is a predictable basis upon which a premium (or discount) may be paid – our research suggests a number of traditional variables that can be analyzed
  - A premium (discount) to consensus forecasts can be estimated
  - Specific potential buyers can better targeted
  - Deal negotiation tactics can benefit from these findings

### For Asset Acquirers (Buy-Side)

1. CI perspective of what premium might be expected (paid by others) can inform targeted offers
2. Differences in company conditions can be partially addressed with deal structure



# Summary

## Future Research

### Future Research

- Apply deal size to this same research
  - It is our opinion that we should further investigate if either the size of the premium paid, or the variables that predict deal premiums would be significantly different under various deal sizes
- Examine these findings over time
  - Recent data suggests that the drivers of deal structures and premiums are changing; investigating if there is a difference between deals structured within the last year are significantly different than those for the previous 3-5 years

