EXANE BNP PARIBAS

PHARMACEUTICALS

Global trends in Pharma

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3 OCTOBER 2016

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Global trends in Pharma

- **Global drug trends**
  - 1990 vs today
  - Drug characteristics
  - M&A
  - Top therapeutic categories & drugs
  - US pricing
- **Exane Pharma Champions League**
  - Publishing
  - Patents
  - Productivity
  - Pricing

Global drug trends

DRUG DISCOVERY: 1990 to today

Industry trend: key words in publications more patient centric

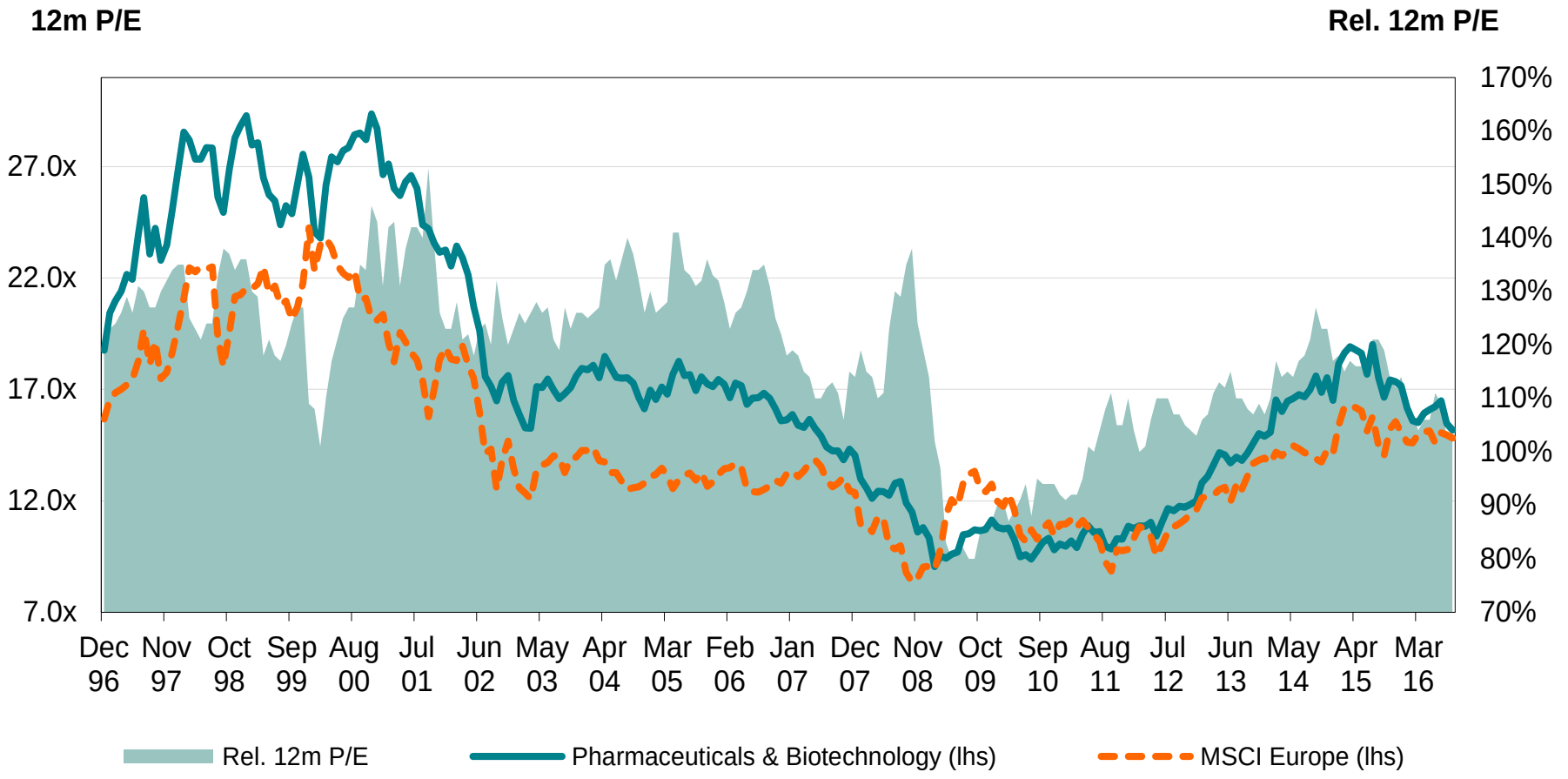
1990

TODAY

Source: Exane BNP Paribas estimates

THE WORLD WE LIVE IN: 1996 to today

Industry trend: technology has impacted everything



Source: Exane BNP Paribas, Factset Estimates, MSCI

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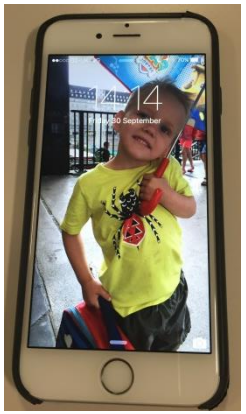

Source: Exane BNP Paribas estimates

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1990

Berlin wall demolished

Iraq invades Kuwait

Nelson Mandela released

Margaret Thatcher resigned

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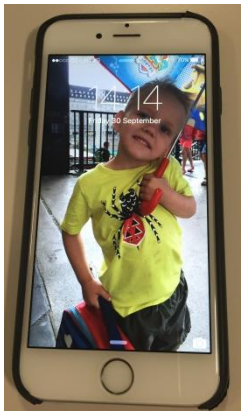

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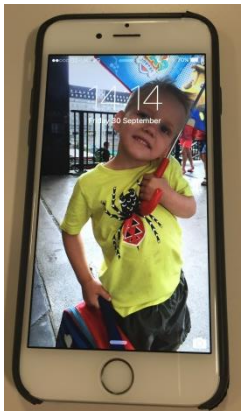

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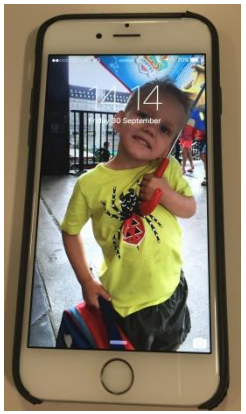
TOP 3 DRUG LAUNCHES:

Pfizer Norvasc – blood pressure $4.9bn

Pfizer Zoloft – depression $3.4bn

Bristol-Myers Pravachol – cholesterol $2.8bn

TODAY



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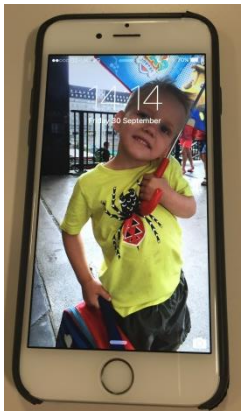


TOP 3 DRUG LAUNCHES?

Intercept Ocaliva – fatty liver $7bn

Roche Tecentriq – cancer IO $6bn

Roche Ocrevus – multiple sclerosis $4bn

Source: Exane BNP Paribas estimates

THE WORLD WE LIVE IN: 1990 to today

Industry trend: technology has impacted everything

1990

TODAY

Source: Exane BNP Paribas estimates

THE WORLD WE LIVE IN: 1990 to today

Industry trend: technology has impacted everything

1990

ITALIA'90

3

4

TODAY

Source: Exane BNP Paribas estimates

THE WORLD WE LIVE IN: 1990 to today

Industry trend: technology has impacted everything

1990

ITALIA'90

3

4

TODAY

46

Source: Exane BNP Paribas estimates

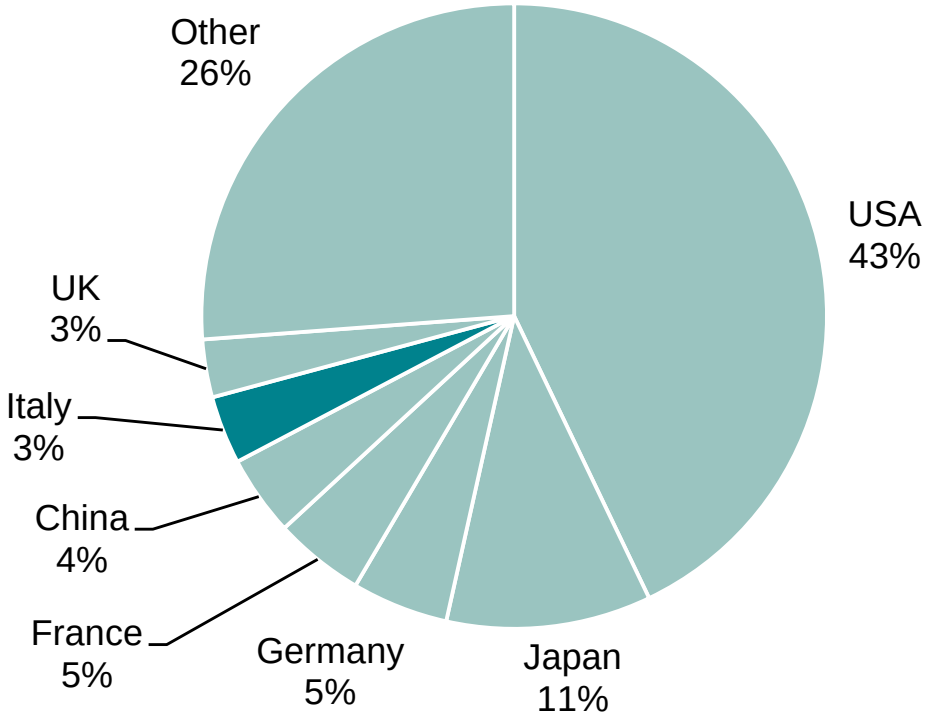
THE WORLD WE LIVE IN: 1990 to today

Industry trend: global pharma market value has quadrupled

Source: Exane BNP Paribas estimates

Global branded Pharma market $669bn

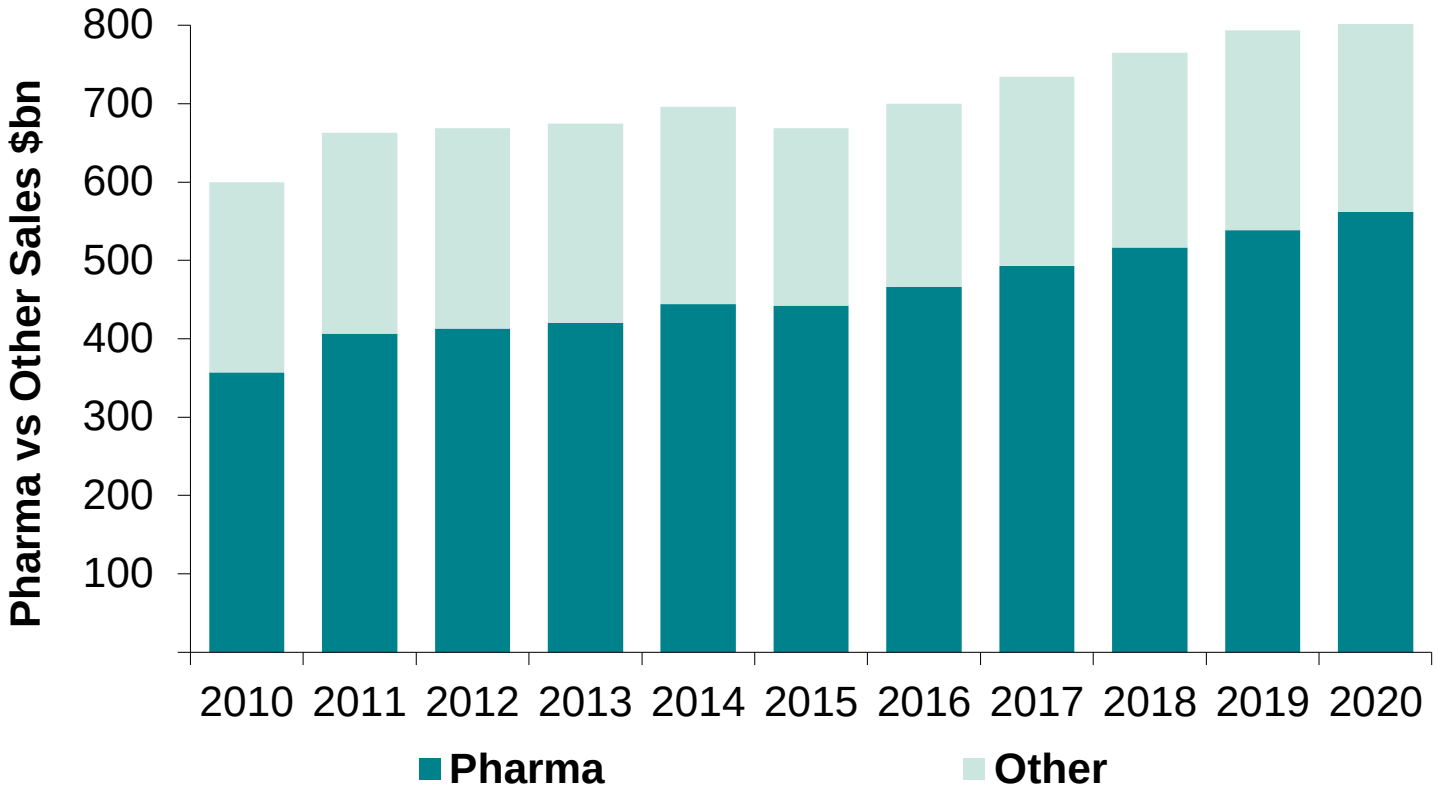
Industry trend: branded drug sales to grow at 6% pa to 2022



Source: Evaluate Pharma data

Diversification: Pharma vs non-Pharma

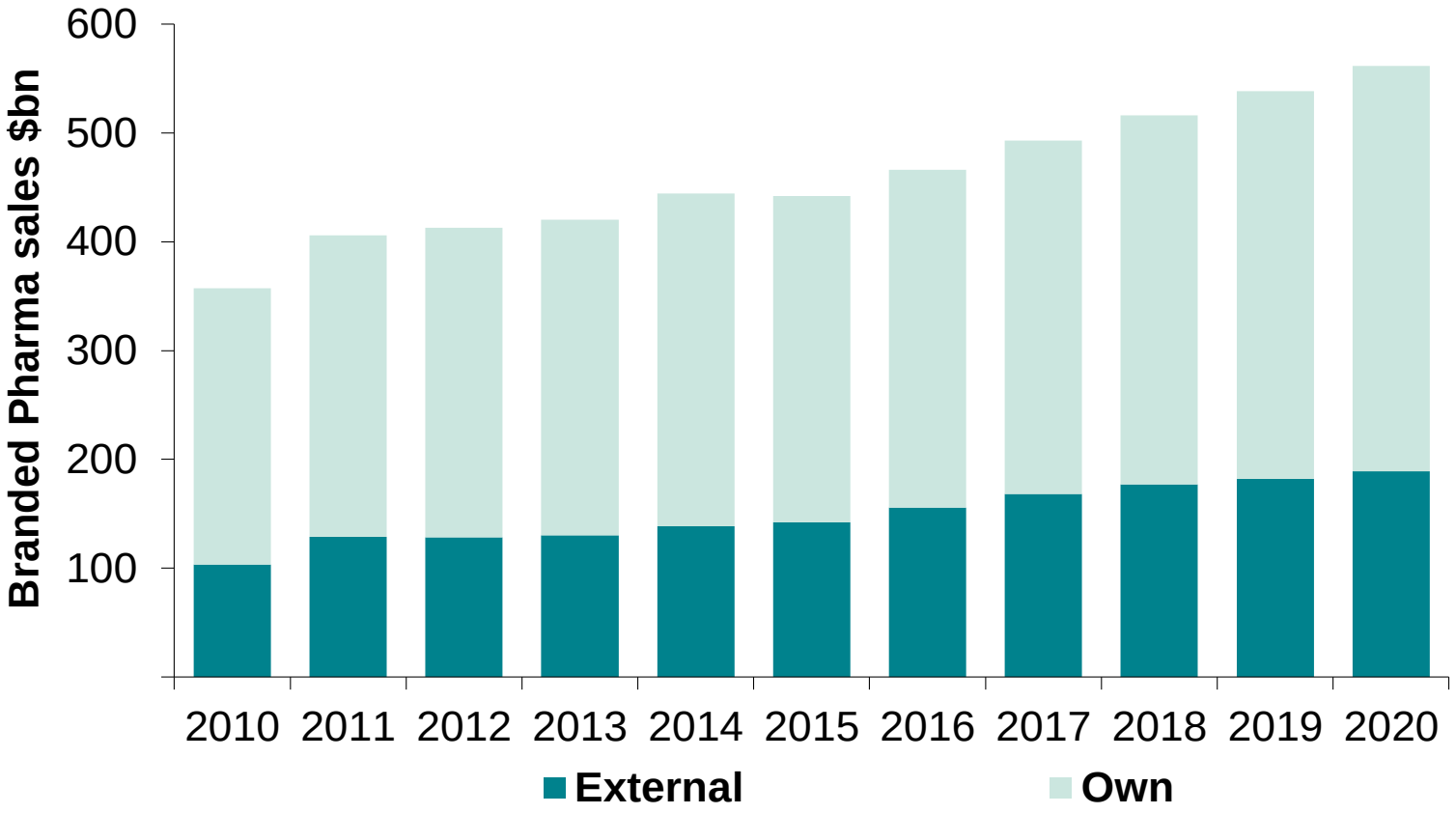
Industry trend: shift away from diversification, 66% of sales in Pharma, 8pp shift



Source: Exane BNP Paribas estimates covering 70% of global market using EvaluatePharma data for US/Japan

Sourcing: internal vs external assets

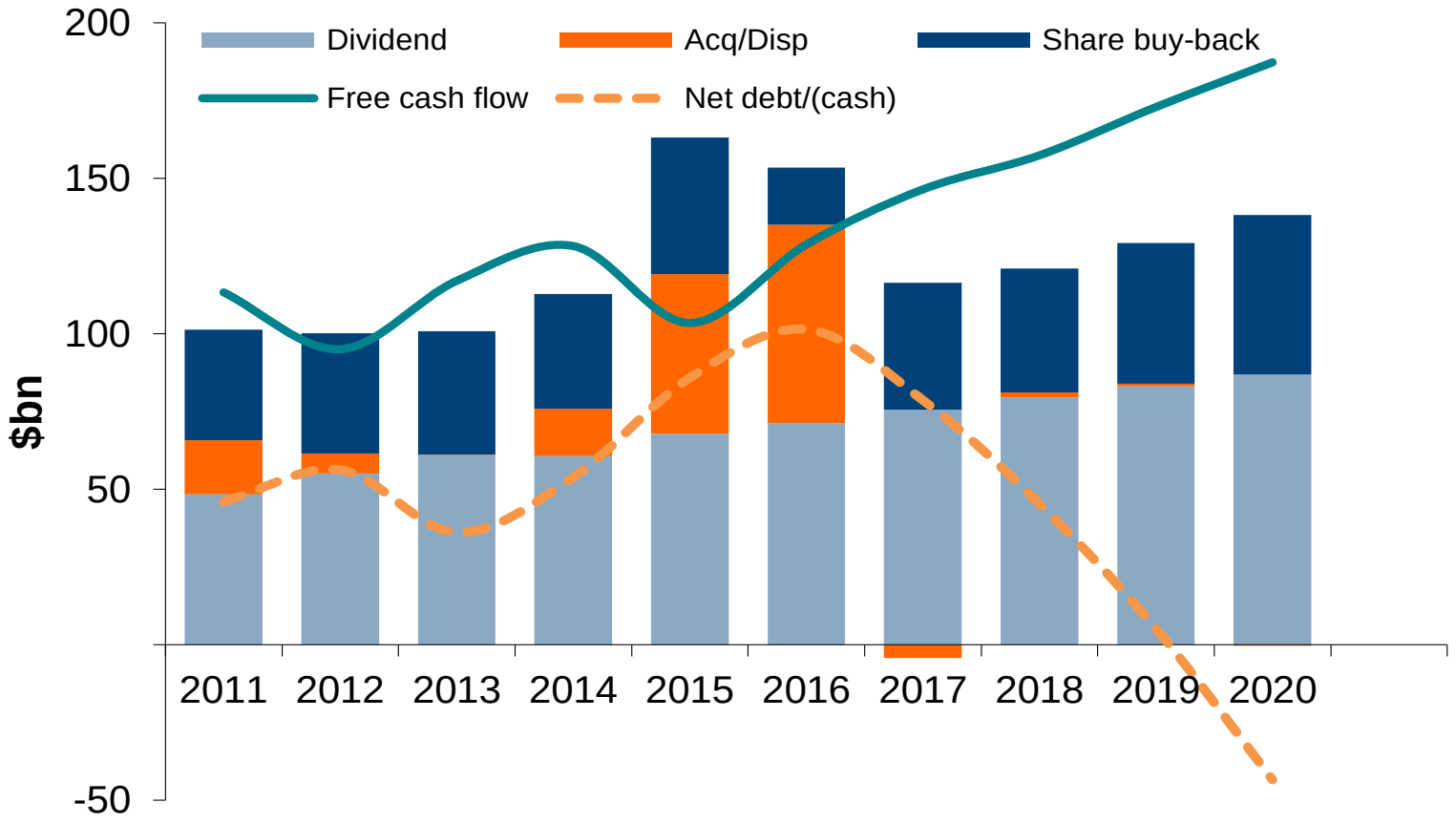
Industry trend: sales from externally sourced assets 32%, 5pp shift



Source: Exane BNP Paribas estimates covering 70% of global market using EvaluatePharma data for US/Japan

Consolidation: M&A has increased for Large Pharma

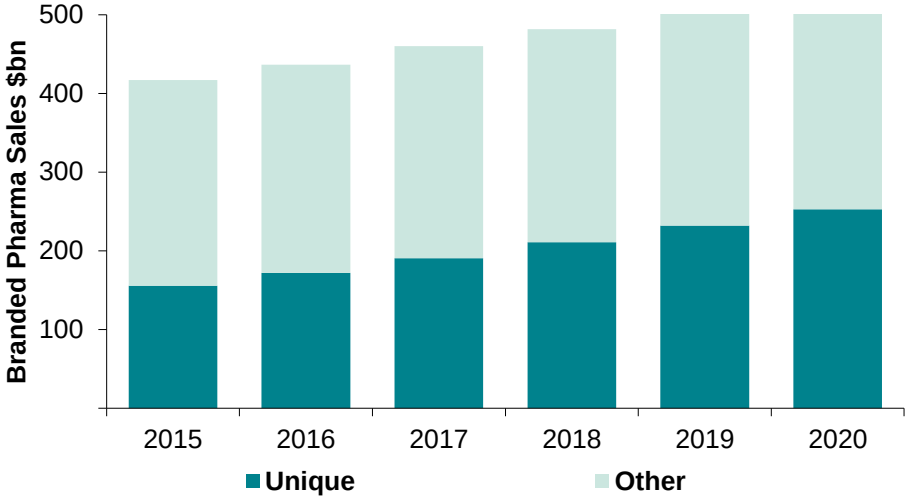
Industry trend: $130bn on acquisitions/disposals 2014-16 vs $24bn 2011-13

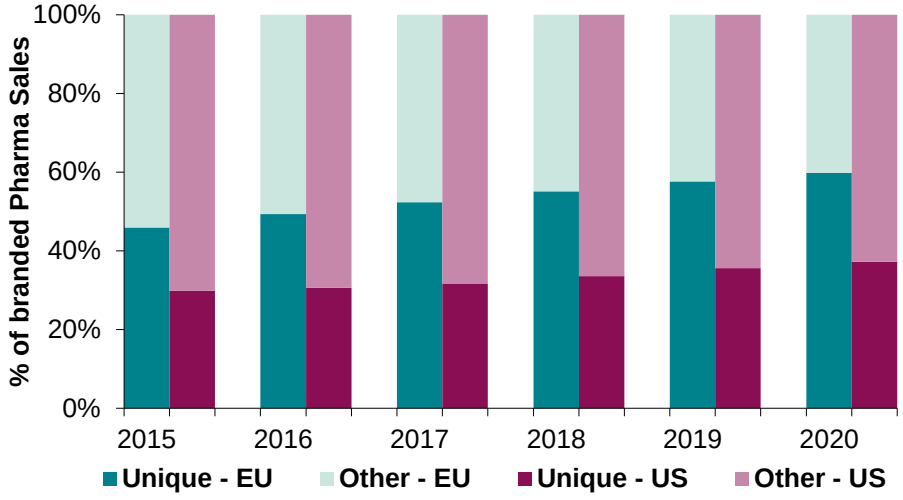


Source: Exane BNP Paribas estimates covering 70% of global market using EvaluatePharma data for US

Drug differentiation: uniqueness profile

Industry trend: highly differentiated drugs 37%, 11pp shift, led by European Pharma

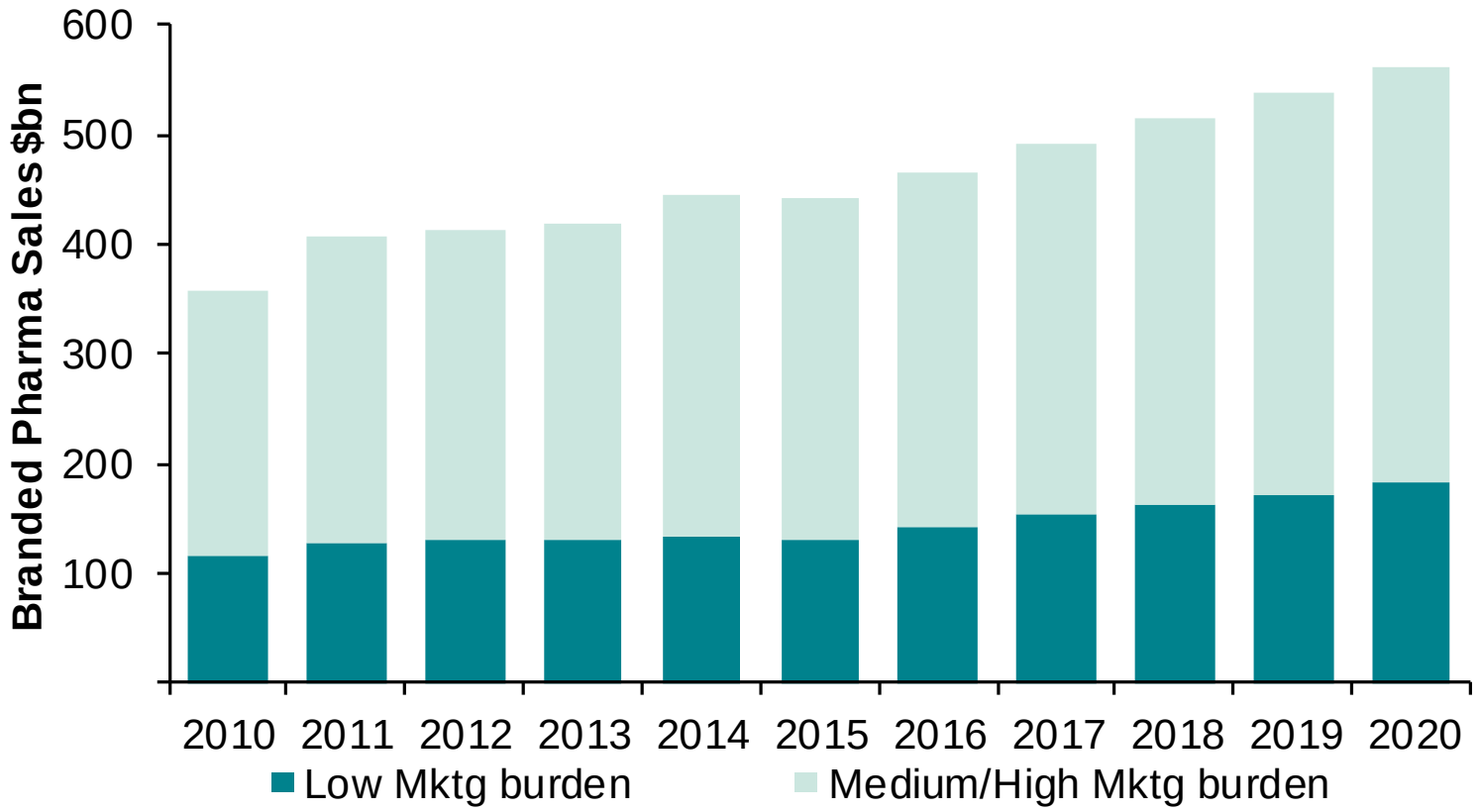




Source: Exane BNP Paribas estimates covering 70% of global market using EvaluatePharma data for US/Japan

Marketing burden: shift towards specialty care

Industry trend: low marketing burden specialty sales 29%



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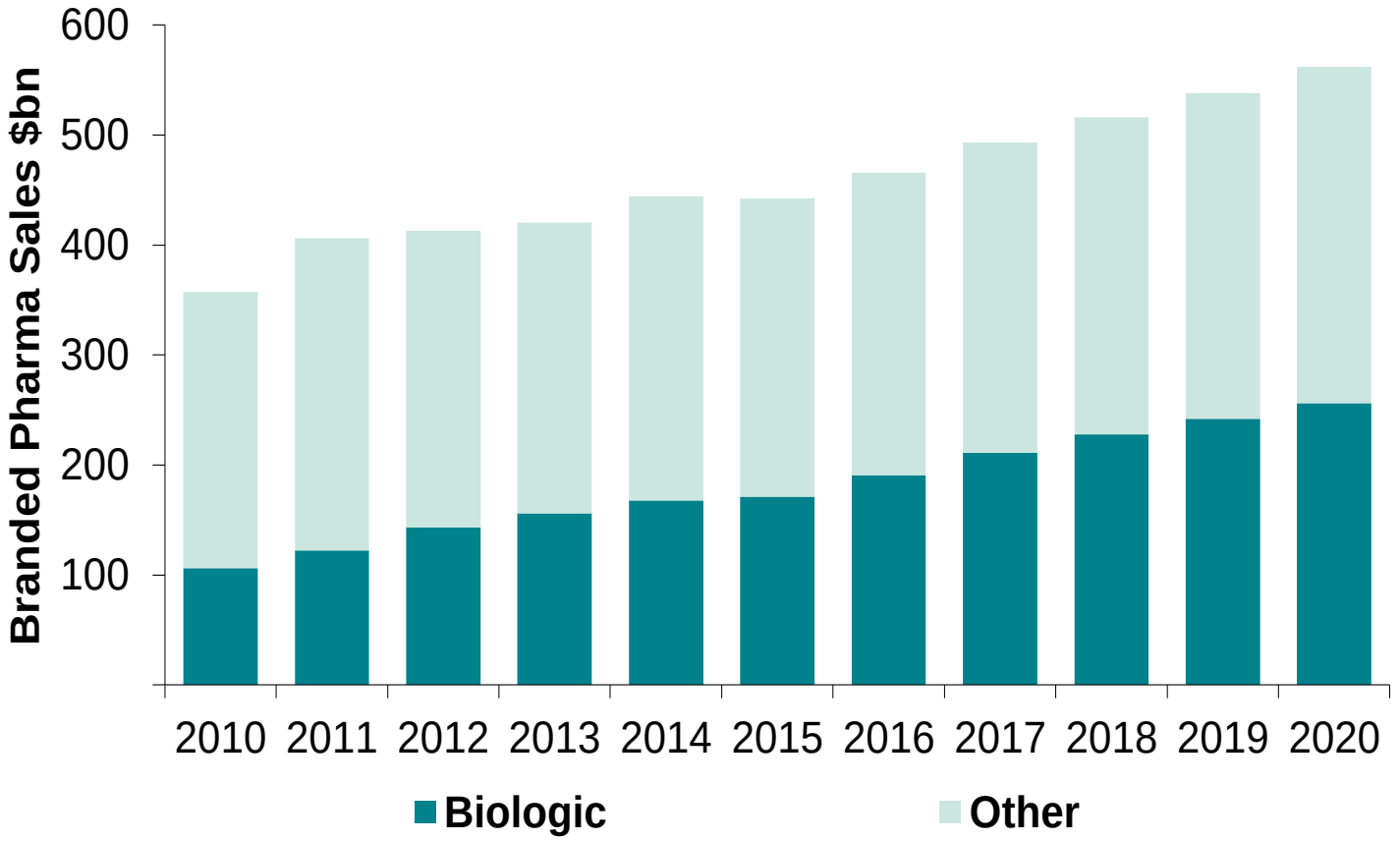
Molecule type: shift towards biologics

Industry trend: significant shift from to complex 'biologic' drugs 39%, 15pp shift



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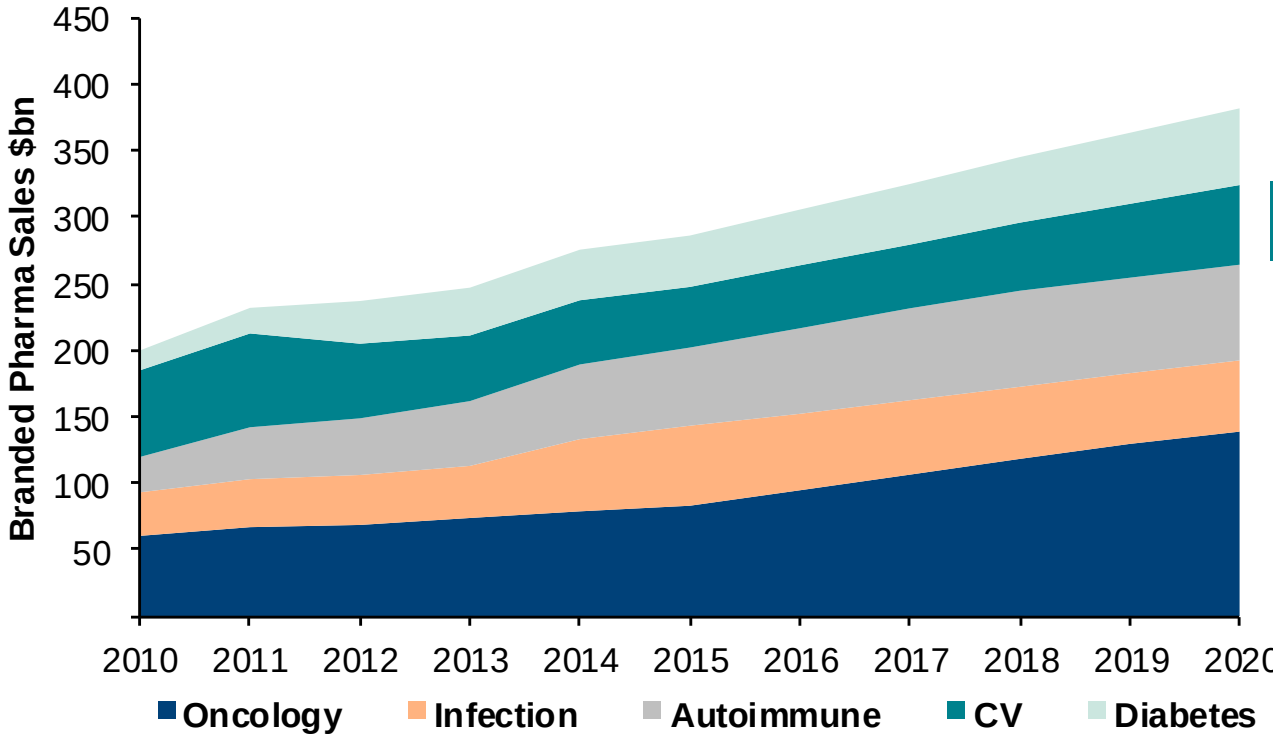
Disease focus: top spending therapeutic categories

Industry trend: Oncology predicted to grow 11% pa & remain top category



Global Branded Pharma Sales $m	2015	CAGR 10-15	CAGR 15-20
Oncology	83,027	7%	11%
Infection	60,200	13%	-2%
Autoimmune	58,814	17%	4%
CV	45,619	-7%	6%
Diabetes	38,657	21%	8%

Source: Exane BNP Paribas estimates covering 70% of global market using EvaluatePharma data for US/Japan

Branded Pharma: top 10 drug spend 2015

Industry trend: payer pressure on the super blockbusters

Top 10 drugs WW 2015			$m
Humira	AbbVie	arthritis	14,012
Harvoni	Gilead	hepatitis C	13,864
Rituxan	Roche	cancer	7,321
Lantus	Sanofi	diabetes	7,089
Avastin	Roche	cancer	6,945
Herceptin	Roche	cancer	6,794
Prevnar	Pfizer	vaccine	6,245
Revlimid	Celgene	cancer	5,801
Remicade	J&J/ Merck & Co	arthritis	5,779
Advair	GlaxoSmithKline	asthma/COPD	5,625

Top 10 drugs Italy 2015			$m
Sovaldi	Gilead	hepatitis C	963
Harvoni	Gilead	hepatitis C	465
Humira	AbbVie	arthritis	288
Herceptin	Roche	cancer	282
Enbrel	Pfizer	arthritis	236
Avastin	Roche	cancer	216
Lovenox	Sanofi	thrombosis	211
Rituxan	Roche	cancer	210
Crestor	AstraZeneca	cholesterol	198
Advair	GlaxoSmithKline	asthma/COPD	182

Source: Company data, EvaluatePharma estimates

Branded Pharma: top 10 drug spend 2020E

Industry trend: Oncology set to dominate

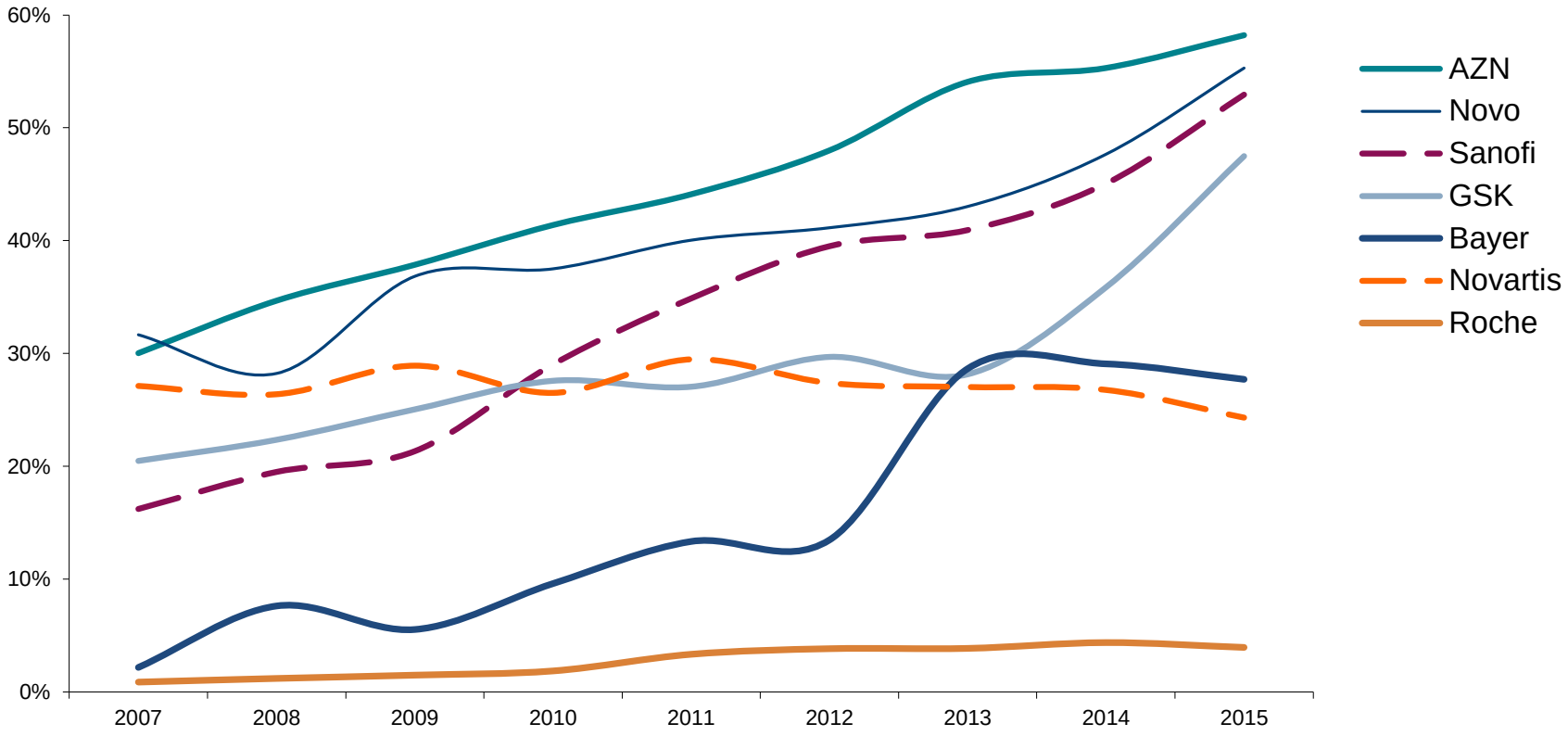
Top 10 drugs WW 2020			$m
Humira	AbbVie	arthritis	16,662
Revlimid	Celgene	cancer	11,685
Opdivo	Bristol-Myers	cancer	9,405
Avastin	Roche	cancer	6,109
Eliquis	Bristol-Myers	thrombosis	6,058
Prevnar	Pfizer	vaccine	6,011
Enbrel	Amgen	arthritis	5,646
Ibrance	Pfizer	cancer	5,603
Harvoni	Gilead	hepatitis C	5,378
Keytruda	Merck & Co	cancer	5,371

Top 10 drugs Italy 2020			$m
Opdivo	Bristol-Myers	cancer	362
Revlimid	Celgene	cancer	316
Humira	AbbVie	arthritis	239
Herceptin	Roche	cancer	209
Perjeta	Roche	cancer	196
Harvoni	Gilead	hepatitis C	195
Avastin	Roche	cancer	188
Enbrel	Pfizer	arthritis	174
Soliris	Alexion	haematology	167
Esbriet	Roche	pulmonary	161

Source: EvaluatePharma estimates

US rebates/discounts as % of gross US sales

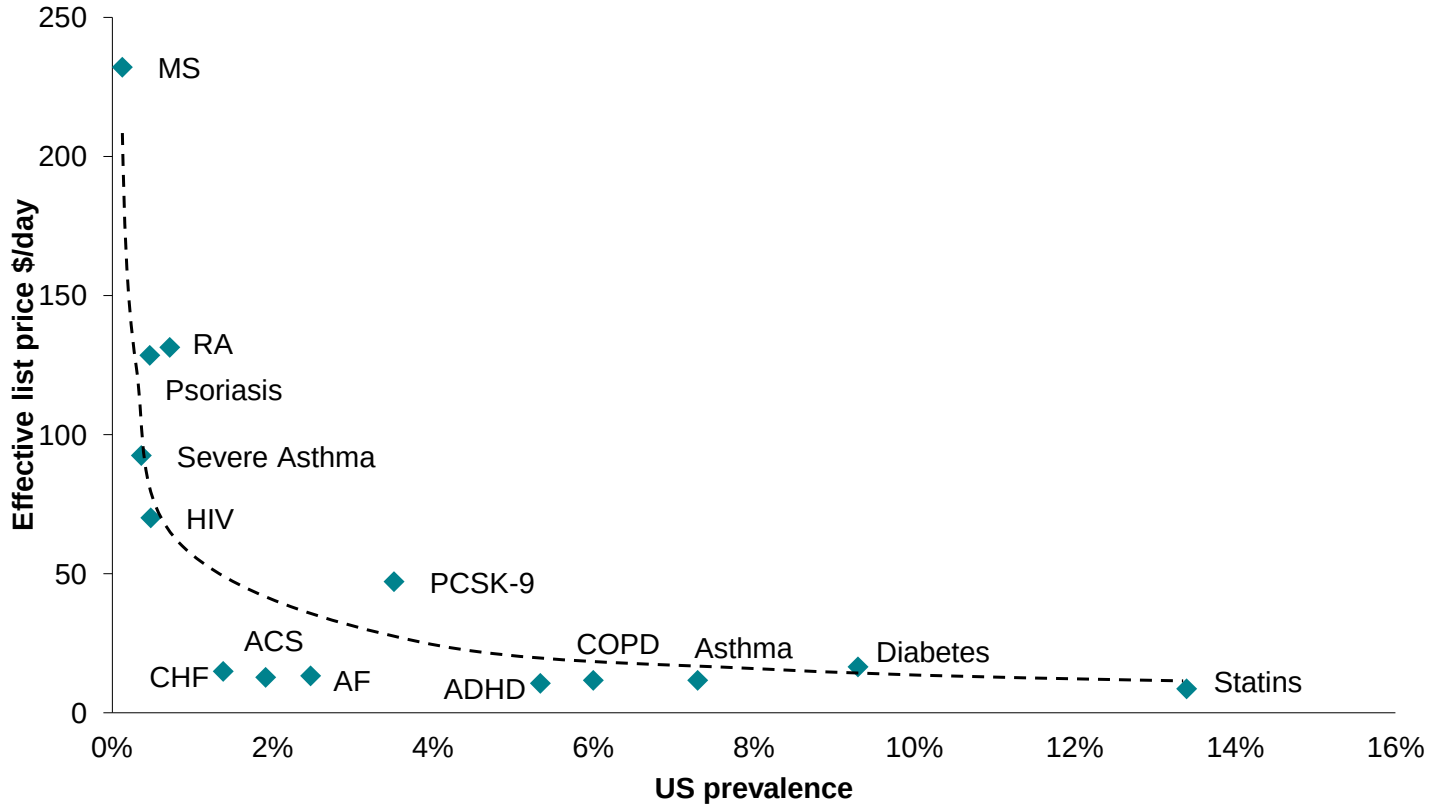
Increasing rebate/discount pressure over time will be offsetting list price inflation in the US



Source: Company data, Exane BNP Paribas estimates

Maximum cost of daily chronic drug therapy in the US (list price)

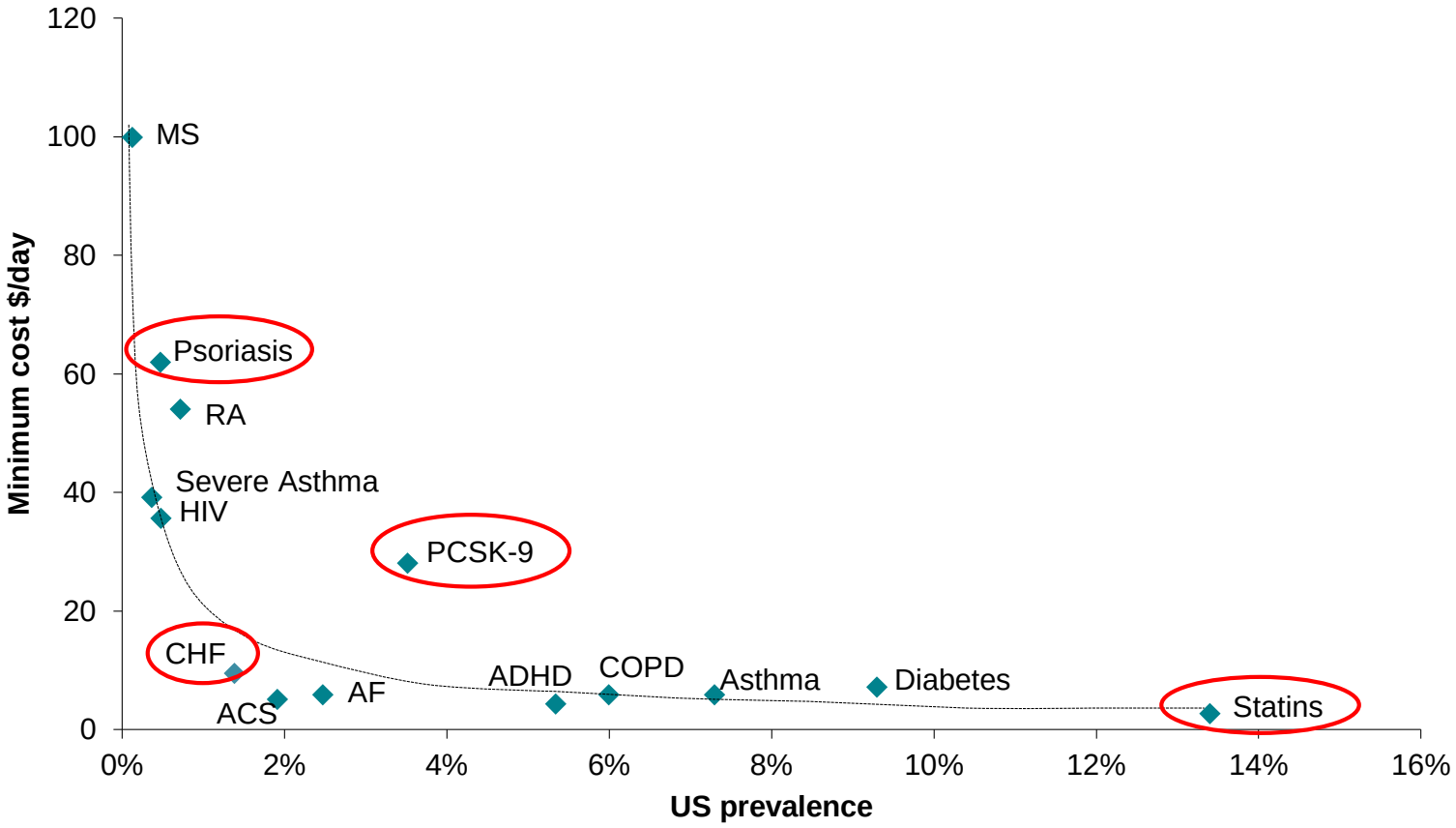
Effective US list price/day vs US disease prevalence – chronic disease categories



Source: Exane BNP Paribas estimates, Medi-Span Rx

Minimum cost of daily chronic drug therapy in the US (VA price)

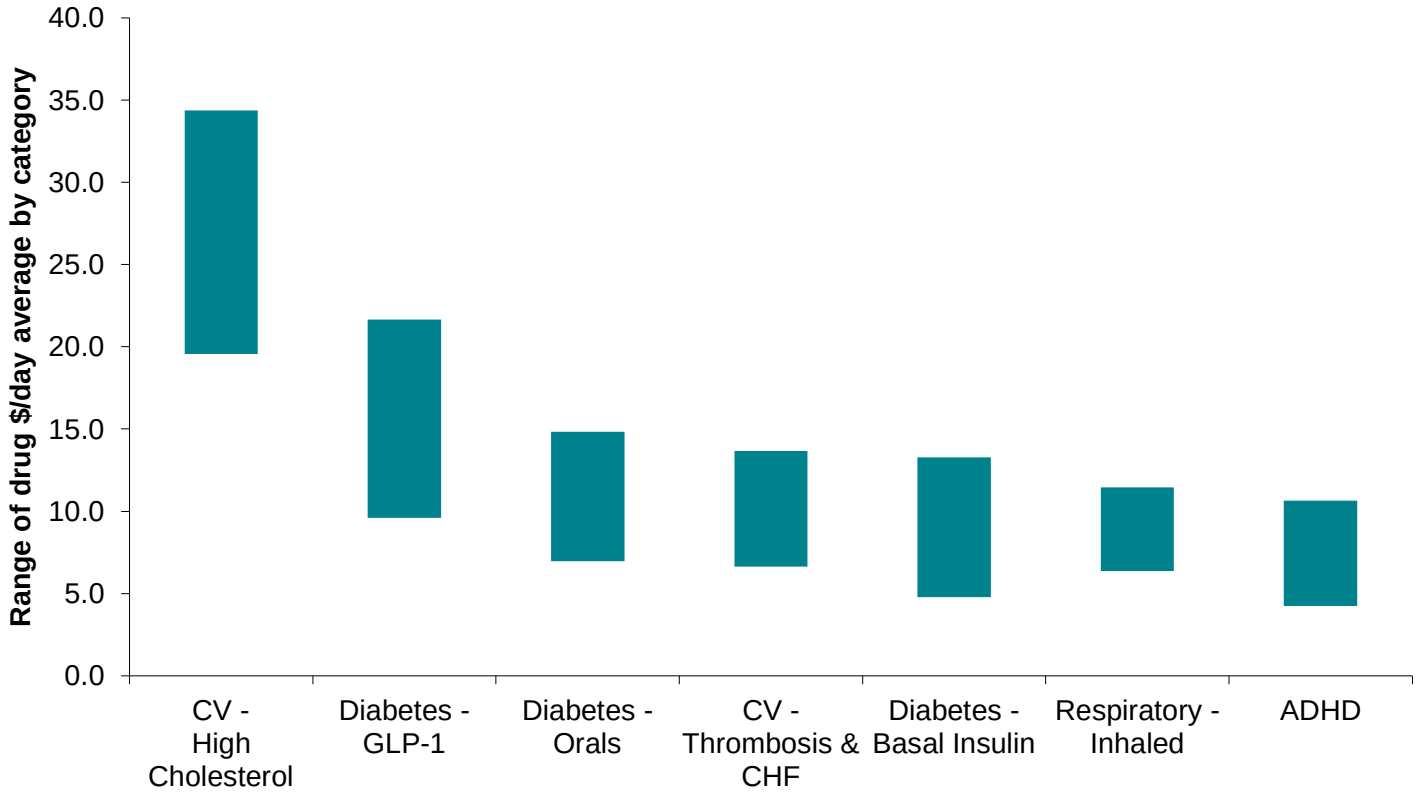
VA net price/day vs US disease prevalence – chronic disease categories



Source: Exane BNP Paribas estimates, US Department of Veterans Affairs, Medi-Span Rx

Maximum and minimum by disease category - primary care

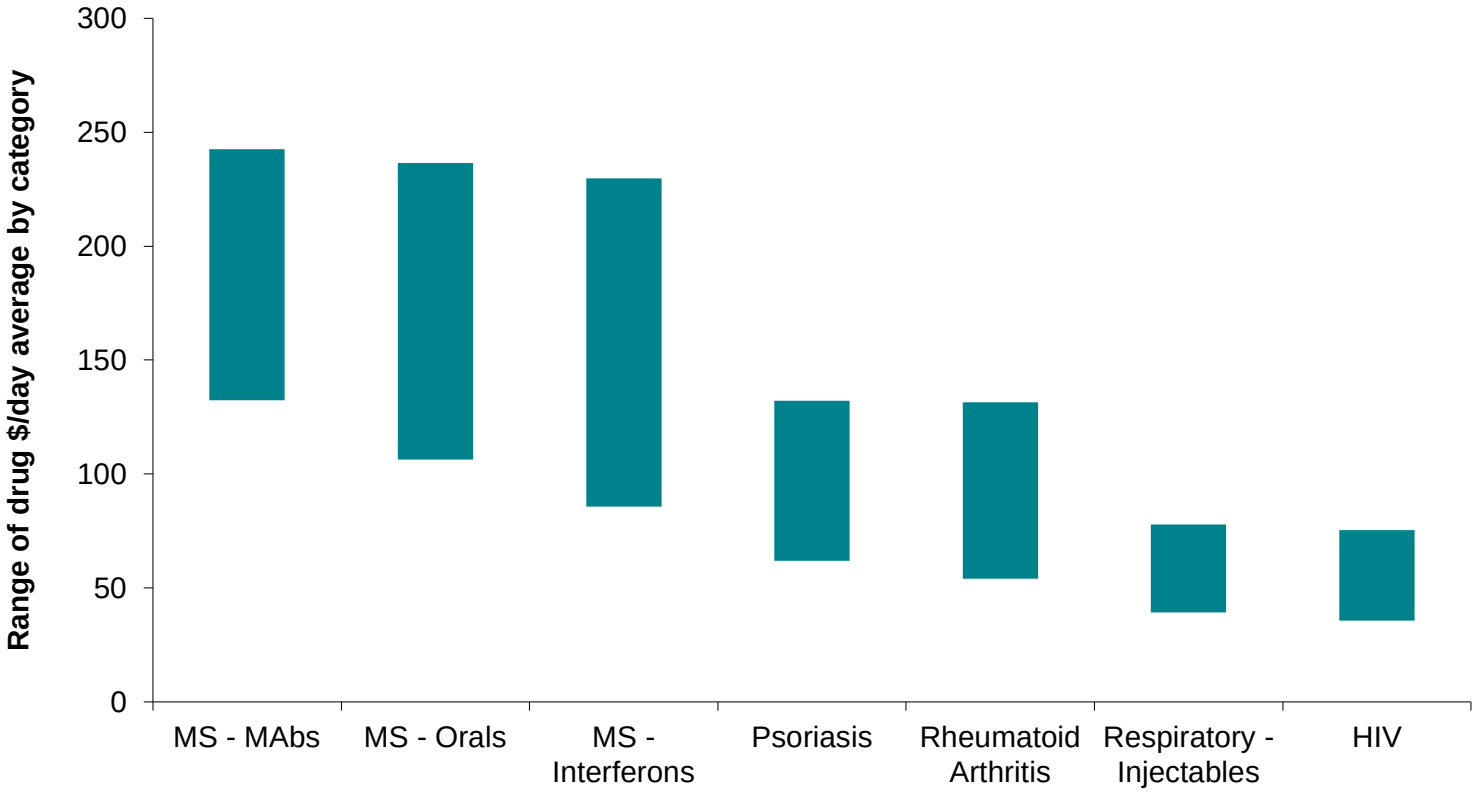
Maximum = Average list price; Minimum = average net price (after VA discount applied)



Source: Exane BNP Paribas estimates, US Department of Veterans Affairs, Medi-Span Rx

Maximum and minimum by disease category - specialty care

Maximum = Average list price; Minimum = average net price (after VA discount applied)



Source: Exane BNP Paribas estimates, US Department of Veterans Affairs, Medi-Span Rx

Exane Pharma Champions League

Exane Pharma Champions League 2016

- **For the third year we publish our annual European Pharma Champions League analysis**
  - – **FIND IT** who is best at discovering new drugs?
  - – **BUILD IT** who is best at developing new drugs?
  - – **SELL IT** who is best at selling drugs?
  - – **SPEND IT** what do they do with the cash?
- **We seek to rate HOW pharma companies generate those outputs, looking at measures of R&D productivity and quality and commercialisation prowess, rather than just WHAT they do**

US & European Large Pharma

TITLE CONTENDERS	BOTTOM OF THE LEAGUE
Novo Nordisk	Bayer
Roche	Johnson & Johnson
Bristol-Myers	

Japanese Pharma

TITLE CONTENDERS	BOTTOM OF THE LEAGUE
Ono	Otsuka

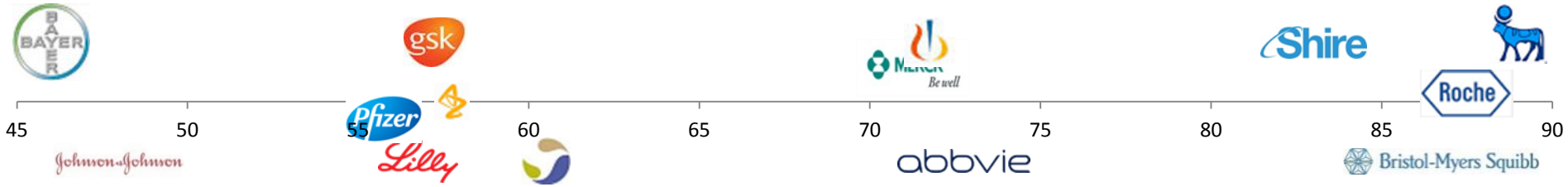
Exane Pharma Champions League – the US/EU scorecard

EXANE PHARMA CHAMPIONS LEAGUE	AbbVie Not rated	AstraZeneca Neutral	Bayer Neutral	Bristol-Myers Not rated	Eli Lilly Not rated	GlaxoSmithKline Underperform	J&J Not rated	Merck & Co Not rated	Novartis Neutral	Novo Nordisk Outperform	Pfizer Not rated	Roche Outperform	Sanofi Neutral	Shire Outperform	Pharma Average	EU mkt Average	US mkt Average
FIND IT- Basic research capability																	
Publication Power	8.3	10.8	5.0	9.3	6.3	8.3	4.5	4.3	7.8	13.5	6.3	7.5	8.5	5.0	7.5		
Patent citations	14.0	3.0	5.5	11.0	5.0	7.5	1.5	11.5	6.5	12.0	5.5	10.0	1.5	10.5	7.5		
BUILD IT- Development ability																	
Clin Trial Quality	11.0	5.0	3.0	9.0	10.0	4.0	1.0	14.0	7.0	12.0	8.0	6.0	2.0	13.0	7.5		
Pharma IRR	7.0	11.0	8.0	13.0	9.0	2.0	6.0	5.0	3.0	14.0	1.0	10.0	4.0	12.0	7.5		
Exane R&D Predictor (5R's)	5.0	7.0	11.0	6.0	1.0	4.0	3.0	8.0	9.0	14.0	2.0	13.0	12.0	10.0	7.5		
SELL IT- Commercialisation skill																	
Exane Launch Predictor	13.0	2.0	1.0	14.0	5.0	12.0	8.0	6.0	9.0	3.0	3.0	10.0	7.0	11.0	7.4		
Product differentiation/ 4D	3.5	7.5	4.0	3.5	4.5	11.0	5.5	5.0	12.0	2.5	10.5	14.0	9.5	12.0	7.5		
Marketing burden	6.0	8.5	4.0	12.5	6.0	7.0	6.5	9.5	7.5	5.0	8.5	9.5	7.0	7.5	7.5		
SPEND IT- Disbursement of cash																	
Use of cash	5.0	3.0	4.5	8.5	10.0	1.5	12.0	8.0	10.0	13.0	11.0	7.5	9.0	2.0	7.5		
TOTAL SCORE	**72.8**	**57.8**	**46.0**	**86.8**	**56.8**	**57.3**	**48.0**	**71.3**	**71.8**	**89.0**	**55.8**	**87.5**	**60.5**	**83.0**	**67.4**		
Final rank	5	9	14	3	11	10	13	7	6	1	12	2	8	4			
Growth																	
2017 Growth - Sales	12%	-2%	5%	14%	6%	7%	3%	1%	3%	5%	7%	4%	-1%	41%	7%	0%	2%
2017 Growth - EPS	15%	-4%	6%	32%	4%	7%	7%	4%	8%	8%	13%	7%	2%	27%	10%	13%	13%
2016-19 CAGR - Sales	10%	4%	4%	12%	4%	5%	3%	1%	4%	7%	4%	4%	2%	19%	6%		
2016-19 CAGR - EPS	18%	13%	6%	27%	9%	5%	7%	4%	9%	10%	9%	7%	3%	22%	11%		
Valuation																	
PE 2017	12.9x	20.8x	12.9x	21.5x	22.2x	21.4x	18.0x	17.0x	17.9x	17.9x	14.0x	15.9x	13.9x	11.8x	17.0x	14.4x	16.5x
Dividend Yield 2017	3.6%	4.3%	3.1%	2.9%	2.7%	5.0%	2.8%	2.9%	3.9%	2.6%	3.6%	3.6%	4.4%	0.6%	3.3%	3.8%	2.2%
FCF Yield 2017		2.6%	5.3%			3.1%			4.5%	5.4%		5.6%	5.5%	7.3%	4.9%		
EV/NPV	1.07x	0.93x	0.91x	0.89x	0.92x	1.05x	1.17x	1.25x	0.90x	0.92x	1.15x	0.88x	0.79x	0.89x	0.98x		
Target Price	**NR**	**5200p**	**€103**	**NR**	**NR**	**1520p**	**NR**	**NR**	**CHF 84**	**DKK 350**	**NR**	**CHF 280**	**€78**	**5900p**			
% up/(down)side to TP		+7%	+10%			-5%			+9%	+17%		+17%	+12%	+24%			
Share price	**$64**	**4858p**	**€94**	**$56**	**$79**	**1592p**	**$119**	**$63**	**CHF 77**	**DKK 298**	**$35**	**CHF 239**	**€70**	**4750p**			

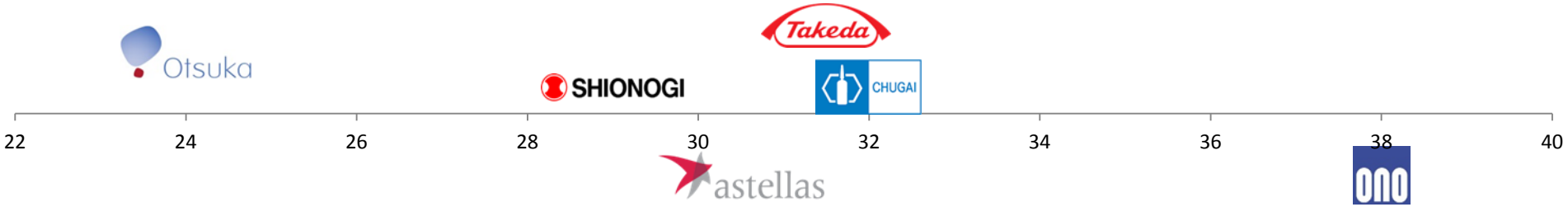
Prices as of 12 Sep. 2016

Source: Exane BNP Paribas estimates

Exane Pharma Champions League – the scores by company



Exane Pharma Champions League Score

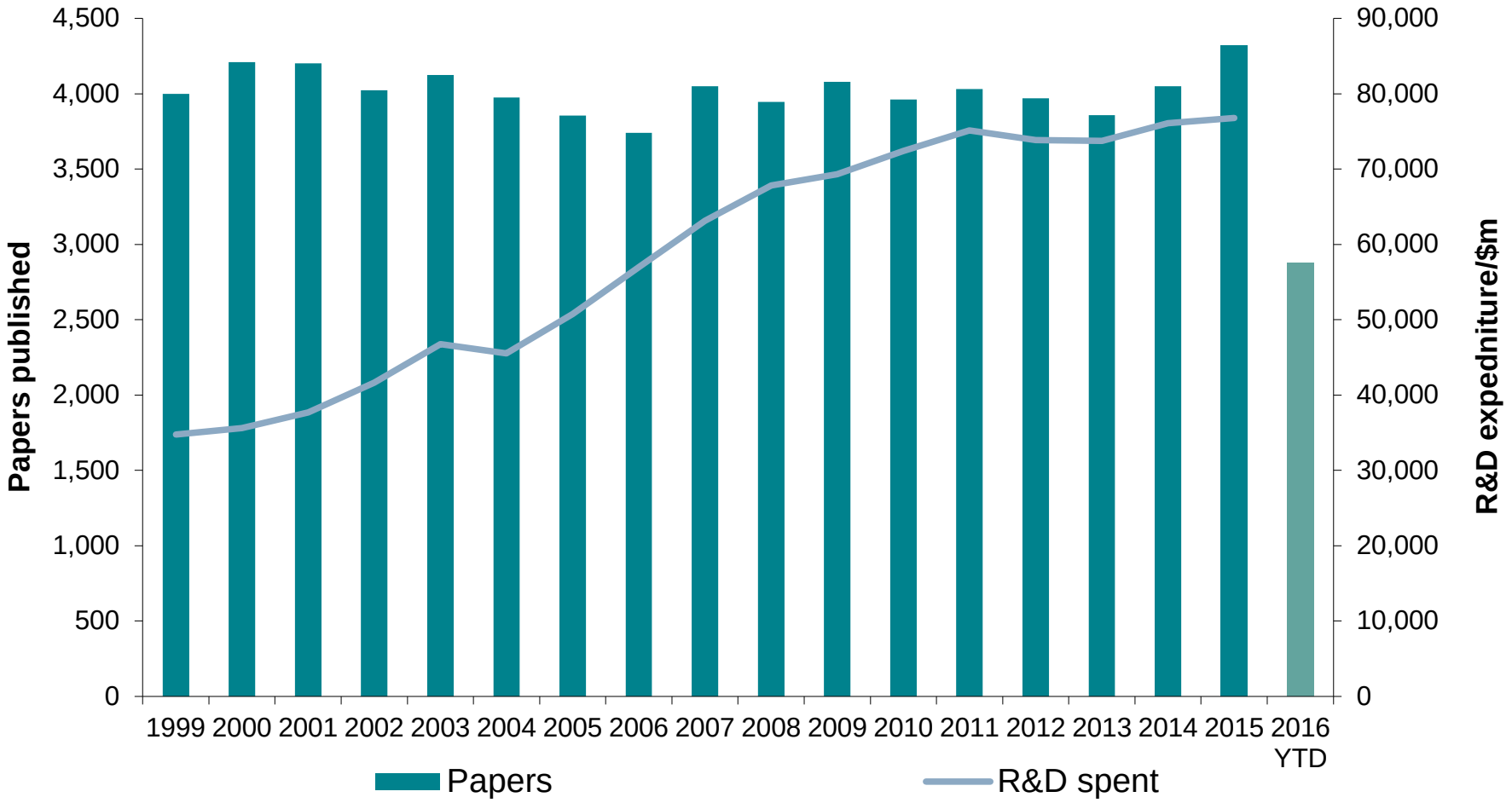


Exane Pharma Champions League Score

Source: Exane BNP Paribas estimates

FIND IT – who is best at discovering new drugs?

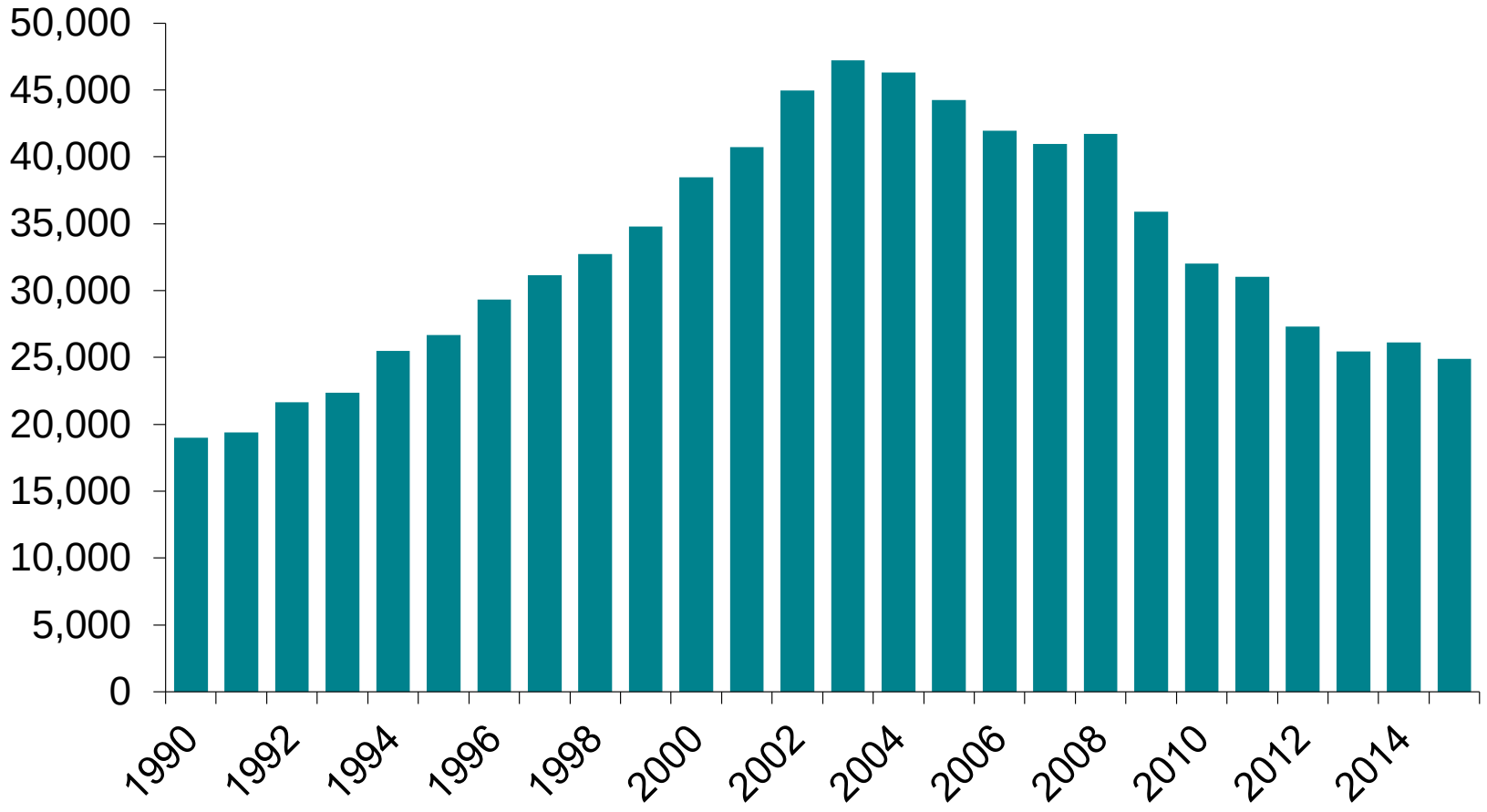
Industry trend: publishing more and in more prestigious journals



Source: Exane BNP Paribas estimates

FIND IT – who is best at discovering new drugs?

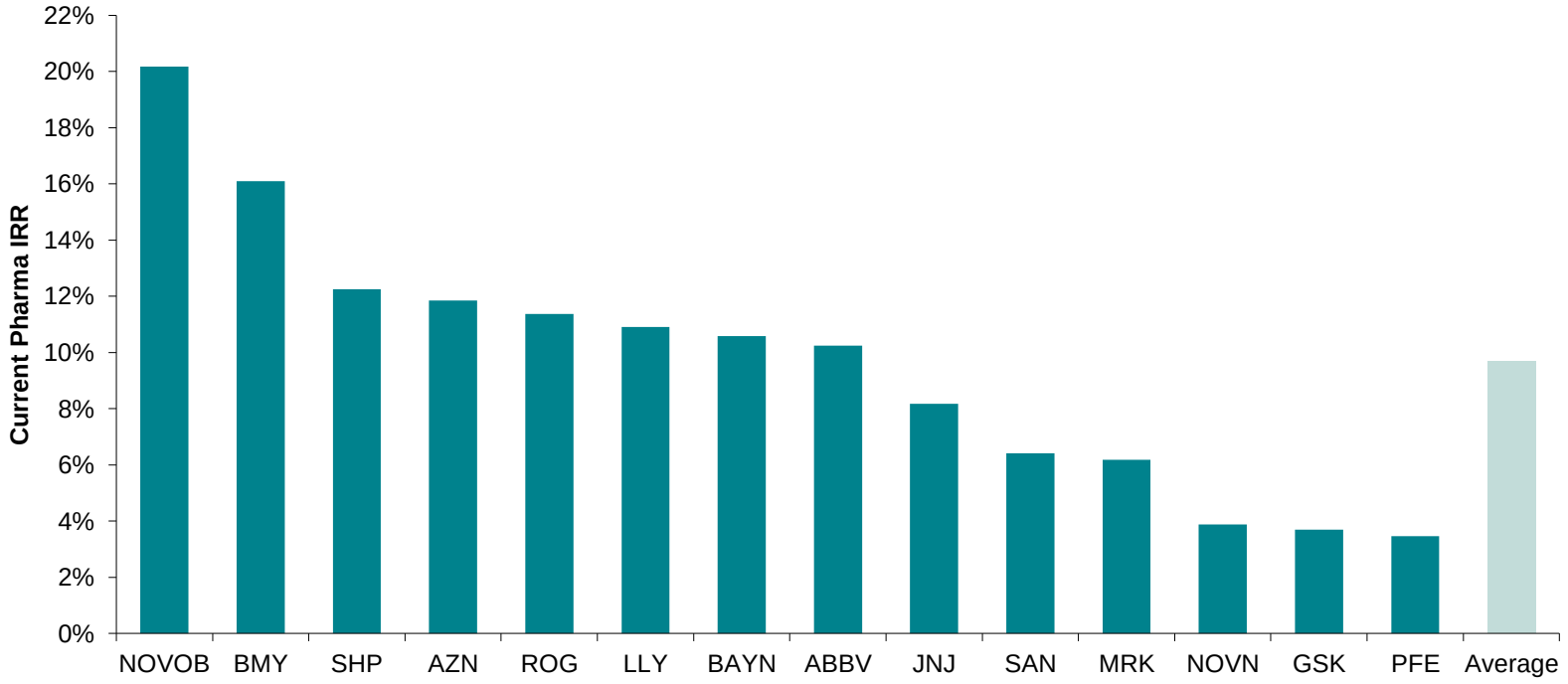
Industry trend: new patent issuance declined but is now stable



Source: Exane BNP Paribas estimates, PatentInspiration

BUILD IT – Current Pharma IRR

Industry trend: the sector average IRR is 10% with a range of 4-20%



Source: Exane BNP Paribas estimates, EvaluatePharma consensus data for US Pharma

SELL IT – Exane 4D (Drug Differentiation, Drug Discount) Risk Analysis

Industry trend: increasing exposure to highly differentiated, low discount risk assets

AVERAGE →

Source: Exane BNP Paribas estimates

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