

VONTOBEL

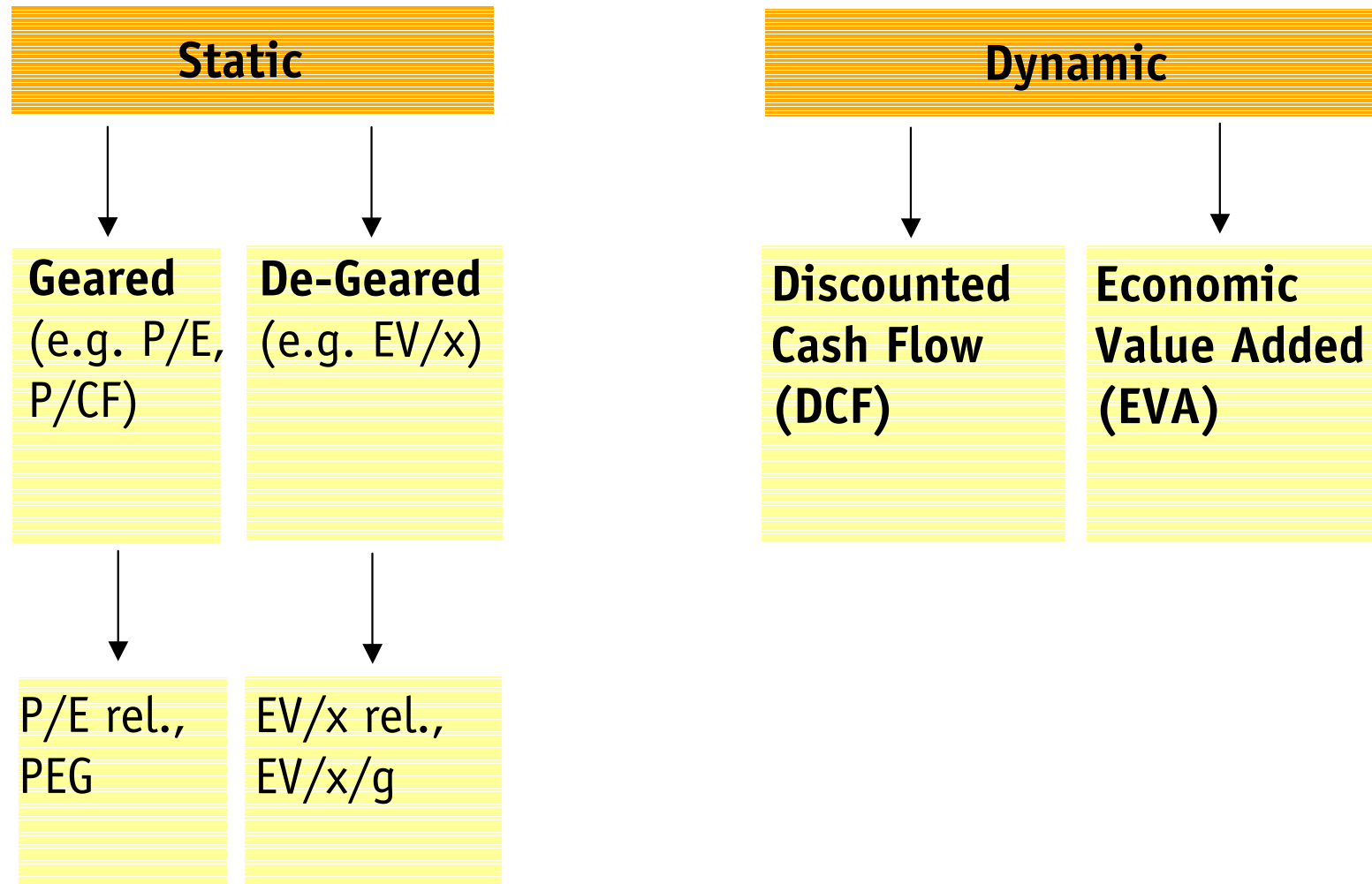
**Pharmaceutical
Valuation
Methodology &
Case Studies**

**Karl Heinz Koch
European Pharmaceuticals**

Content

Valuation Methodologies - An Overview	3
Static Valuation Methodologies (Pros and Cons)	4-8
Dynamic Valuation Methodologies (Pros and Cons)	9
Vontobel Pharma Valuation ("Net Portfolio Add-On Potential")	10-21
Case Studies:	
- Special Situations (i.e. Roche, Novartis)	22-39
- Nycomed - "Life Beyond Pantoprazole"	40-44

Valuation Overview



Static "Geared" Valuation Methods (1)

- **Price per share relative to Earnings per share, the so-called "PER"**
- **Pros:**
 - "Simple" (no adjustments needed)
 - Widely used because they are "simple"
- **Cons:**
 - Misleading due to lack of comparability
 - Different accounting philosophies (shareholder focus versus tax authorities)
 - Different balance sheet structures ("Gearing")

Gearing affects P/E ratios (PER)

USD million	Company A	Company B
Market Capitalisation	100	50
Level of debt	0	50
Cost of debt (interest rate p.a.)	12%	12%
Earnings before interests and taxes (EBIT)	10	10
Net interest	0	6
Pre-tax profit (PTP)	10	4
Taxes (@ 35%)	3.5	1.4
Net profit	6.5	2.6
PER	15.4x	19.2x

Static "Geared" Valuation Methods (2)

- **Price per share relative to Cash Flow per share, so-called "P/CF"**
- **Pros:**
 - More accurate cross-company comparability within a sector (assuming similar capital structures)
 - More accurate assessment of "cash" operating performance
- **Cons:**
 - Not as widely used due to lack of information that spots "cash" from "non-cash" items
 - Insufficiently accounts for minority interests, capital requirements and is even more sensitive to "gearing" than a PER

Static "De-Geared" Valuation Methods (1)

- **Enterprise Value (EV) relative to "Revenues" per share**
- **Pros:**

Values assets of a company by looking at the whole enterprise (hence the term "enterprise value") independent of the capital structure of the company (which is different from just looking at "equity" in the case of geared valuation methods); (known as Proposition 1 by Miller and Modigliani)
- Allows for a distinction between a company's "core" and "non-core" assets (widely used by so-called "company raiders")
- **Cons:**
 - Imperfections of markets mean that companies are not always able to restructure their balance sheet at will or at negligible cost
 - Strong assumptions built into EV methodology: tax neutrality between equity and debt,

Static "De-Geared" Valuation Methods (2)

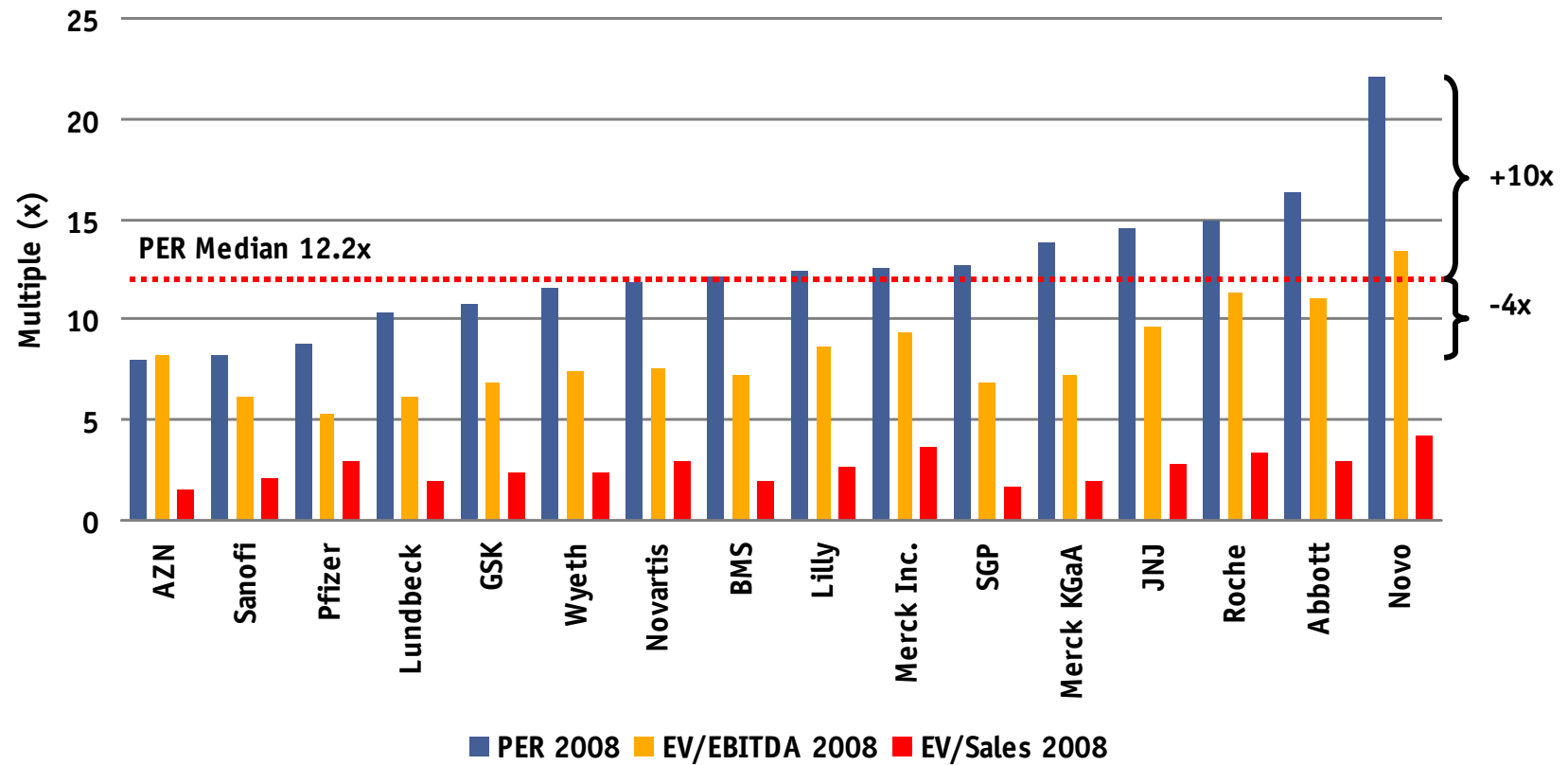
- **Enterprise Value (EV) = Market Capitalisation + Value of net debt (average for the year) - Estimated Value of "non-core" assets**
- **Pros:**
 - Removes the often significant distortion due to different capital structures
- Allows to value individual businesses
- **Cons:**
 - Not as widely used due to adjustments needed ("can not be easily commanded on traditional financial services such as Bloomberg")
 - Sometimes difficult assumptions needed to value non-core businesses and impact of tax wedges due to imperfect capital markets

Dynamic Valuation Method - DCF

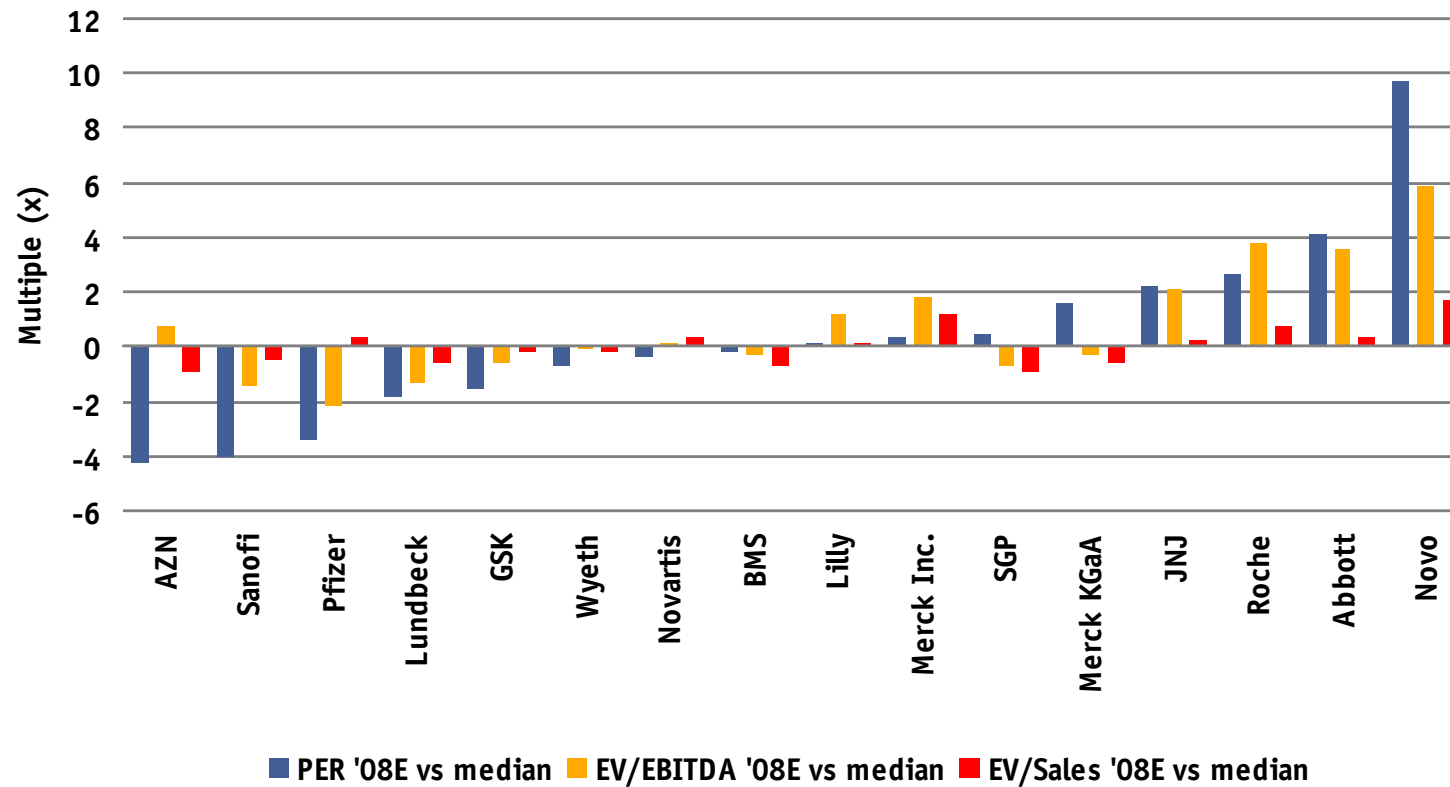
- **Discounted Cash Flow Model**
- **Pros:**
 - Allows valuation of companies with no near-term sustainable cash flow streams (or even loss making companies, i.e. biotechnology)
 - Appropriate for businesses with discretionary cost structures and long product cycles, such as **pharmaceuticals**
- **Cons:**
 - A large part of the NPV is driven by the growth rates in the terminal value which are difficult to predict
 - Many businesses do not lend themselves to the long-term predictions needed for a DCF model (though pharmaceutical and biotechnology companies do)

Vontobel Pharmaceutical Valuation Model based on "Net Portfolio Add-On Potential"

Relative Valuation Multiples for Pharmaceuticals



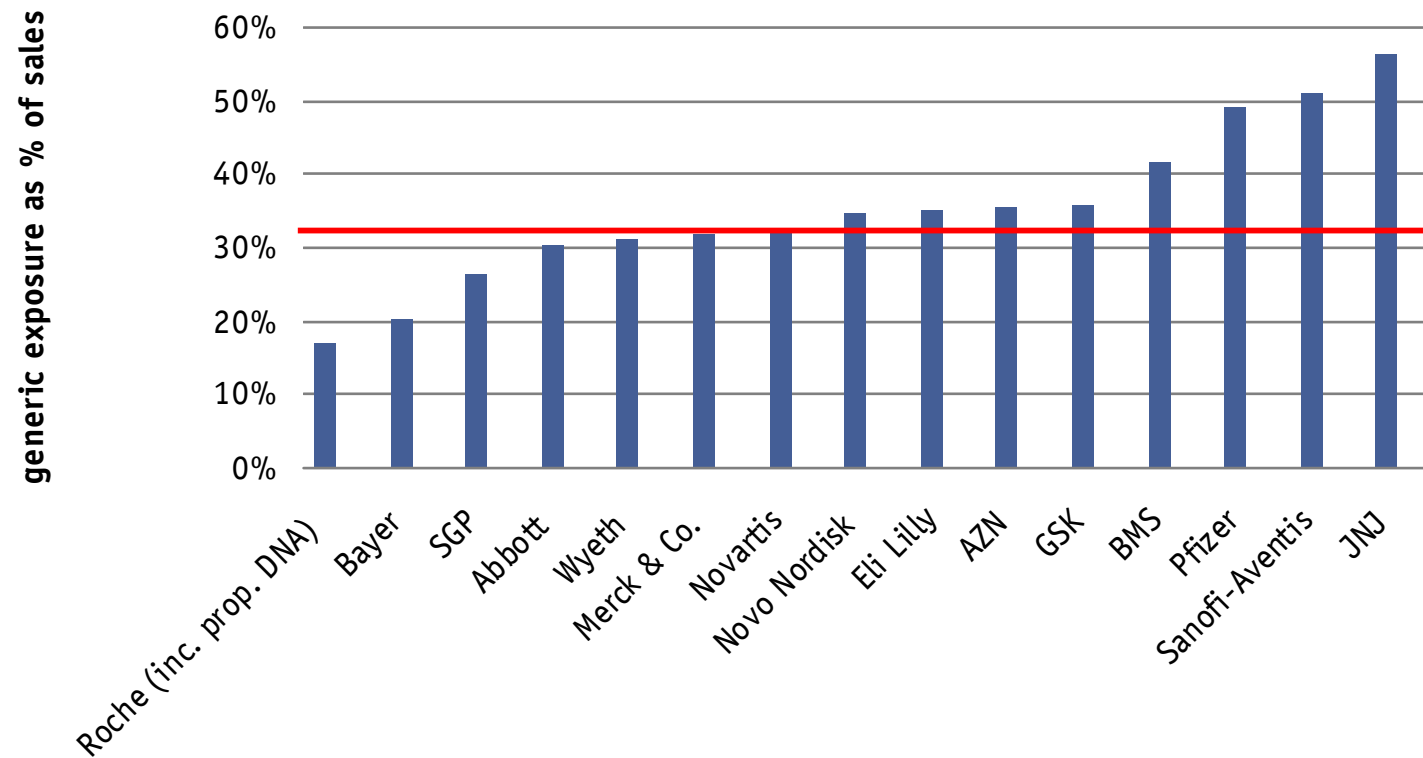
Large Variances in Relative Valuation Multiples



Why Has Valuation Analysis Been Poor in the Past?

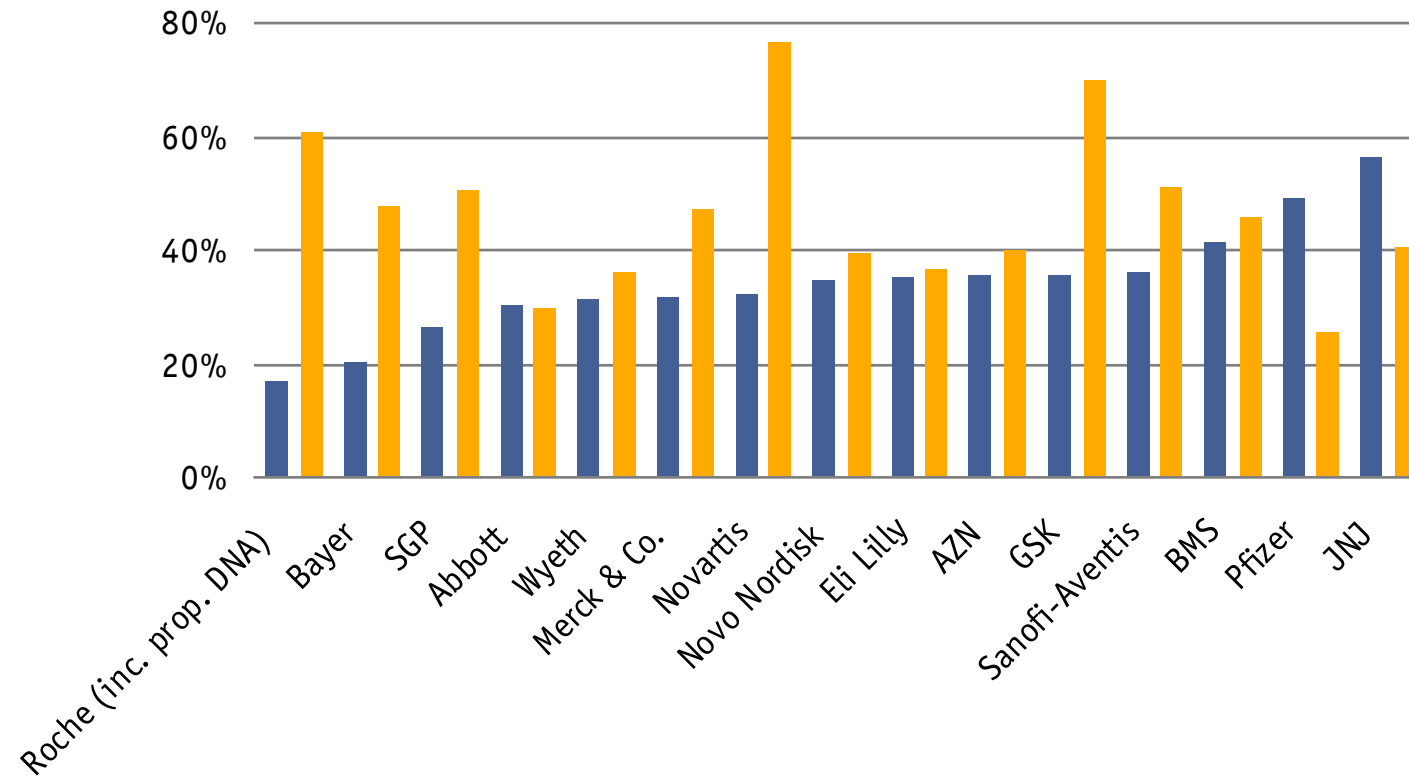
- **Relative Earnings Multiples (geared or de-geared) Can Be Misleading because:**
- Much of a stock's value is driven by future drug revenues, which are difficult to predict accurately
- A. they tend to penalize innovative companies since they are the ones that have to absorb the high cost of large-scale clinical studies and market introduction;
- B. they favor companies that lack new product flow, not least as profitability measures tend to rise in the short term due to a lack of (product) investment opportunities
- Furthermore, relative valuation multiples do not take into account important quality differences because "growth is not simply growth" and only sustainable growth driven by new products determines valuations in the sector.

Patent losses - The Only Certainty

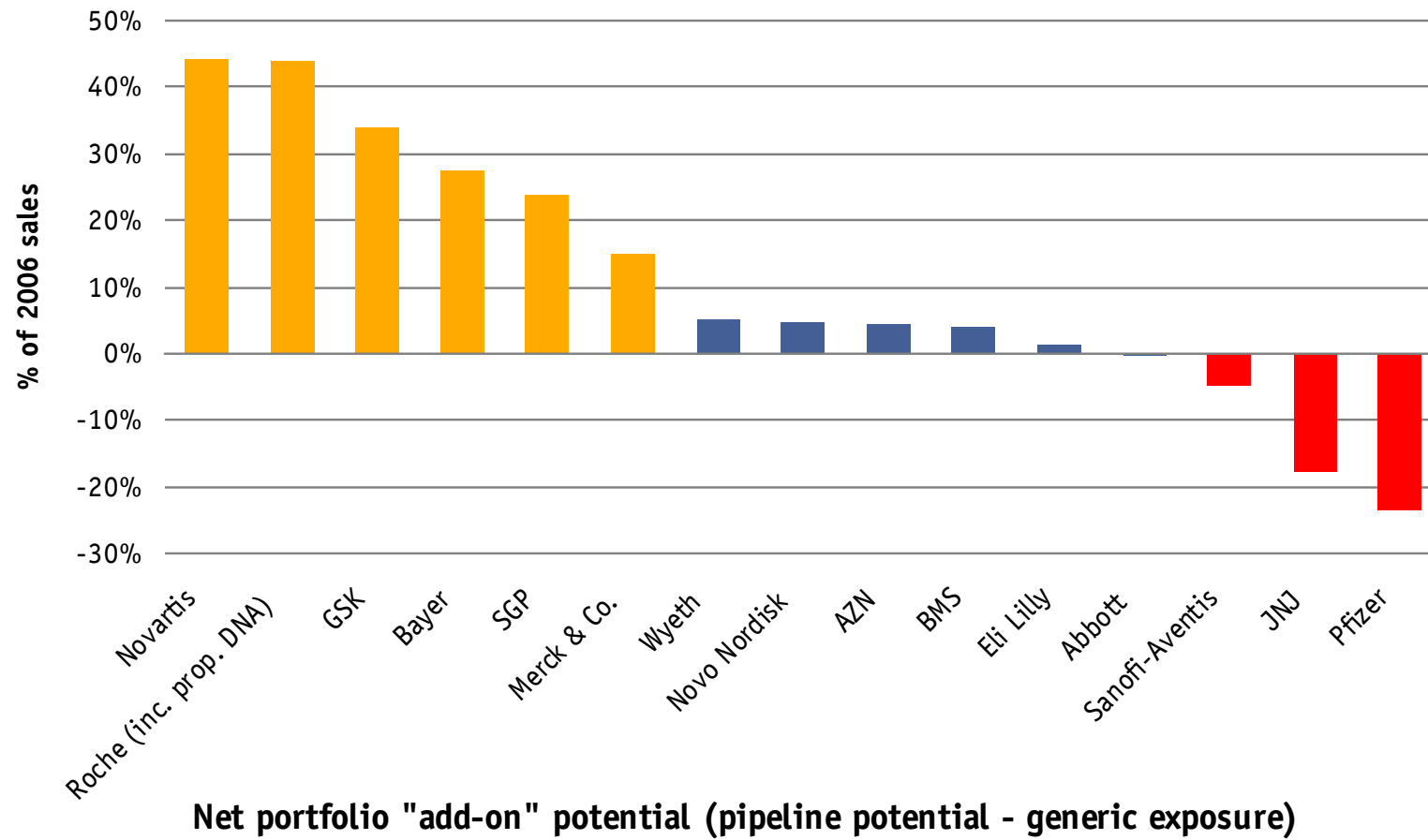


The Difference is in The Balance

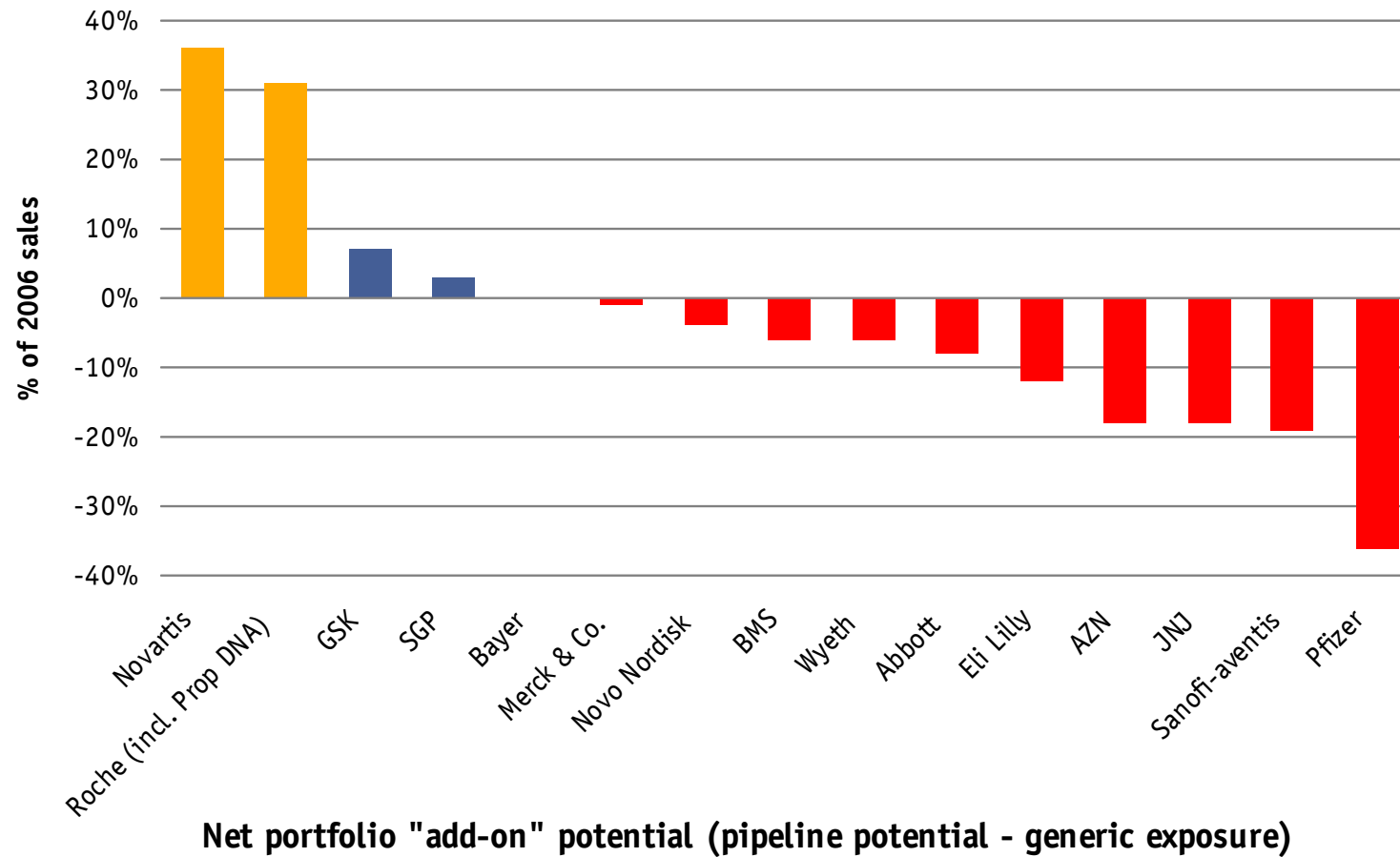
generic exposure vs pipeline potential (as % of sales)



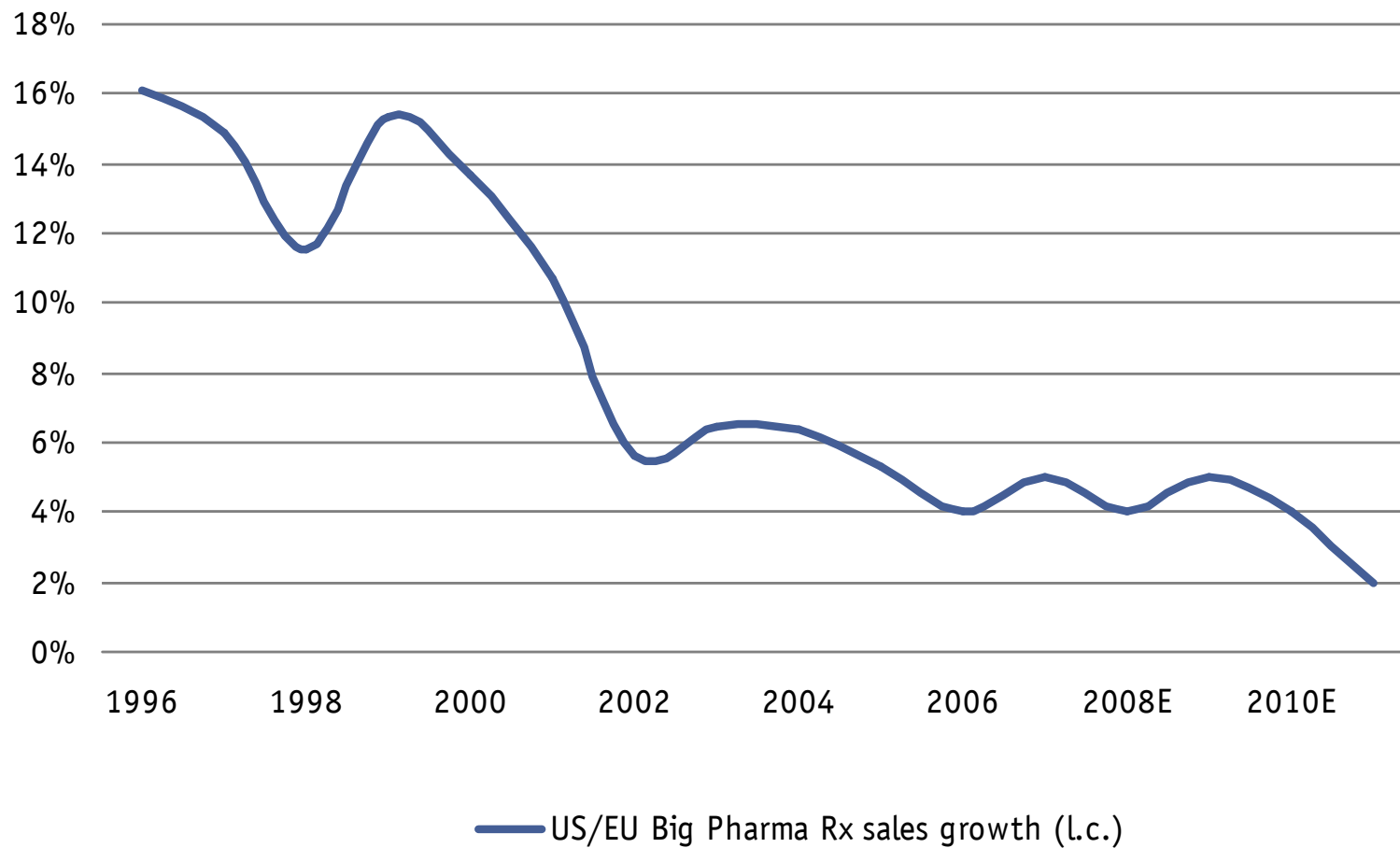
Winners And Losers ... Broadly Speaking (Phase 1-3)



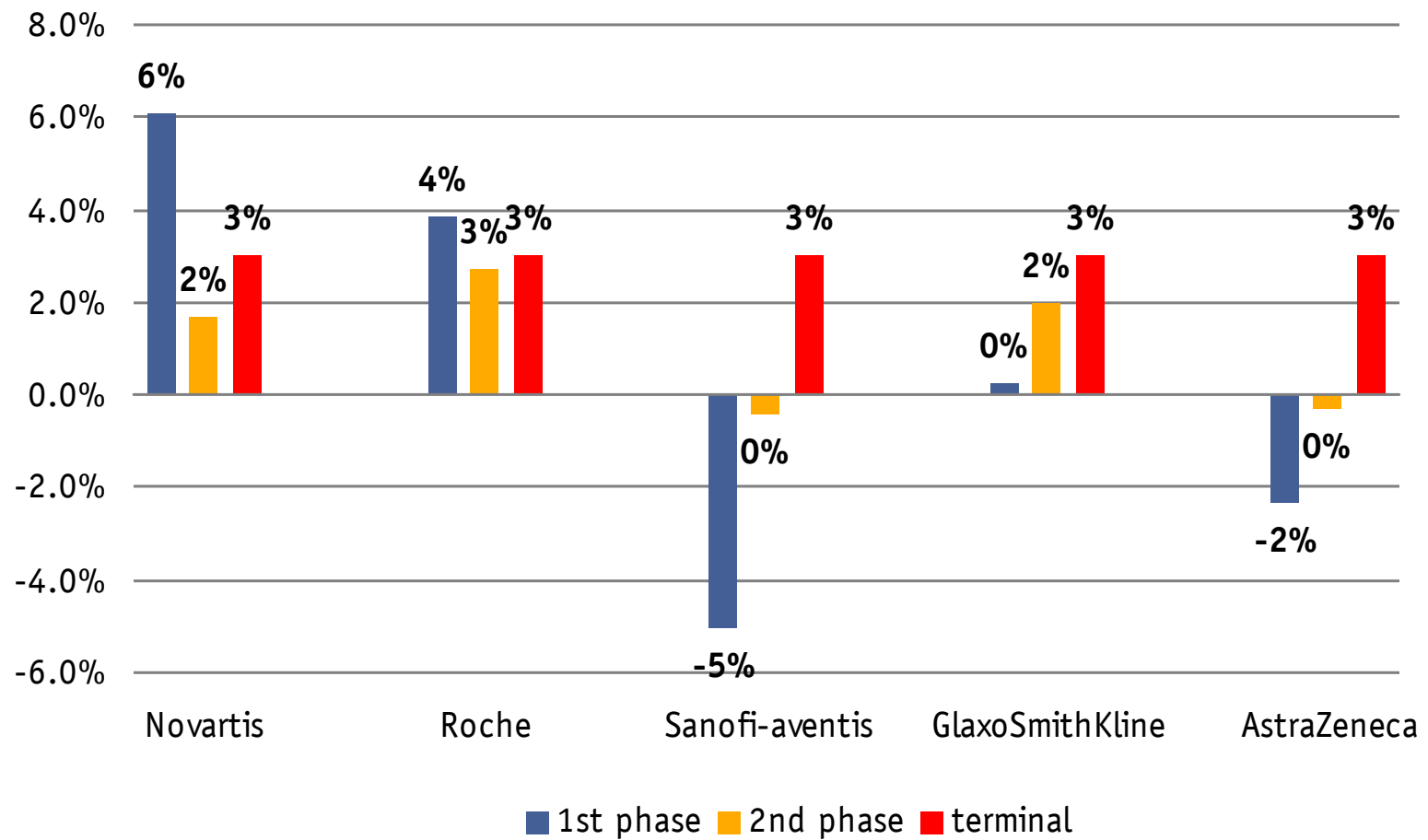
Winners And Losers ... Strictly Speaking (Phase 3)



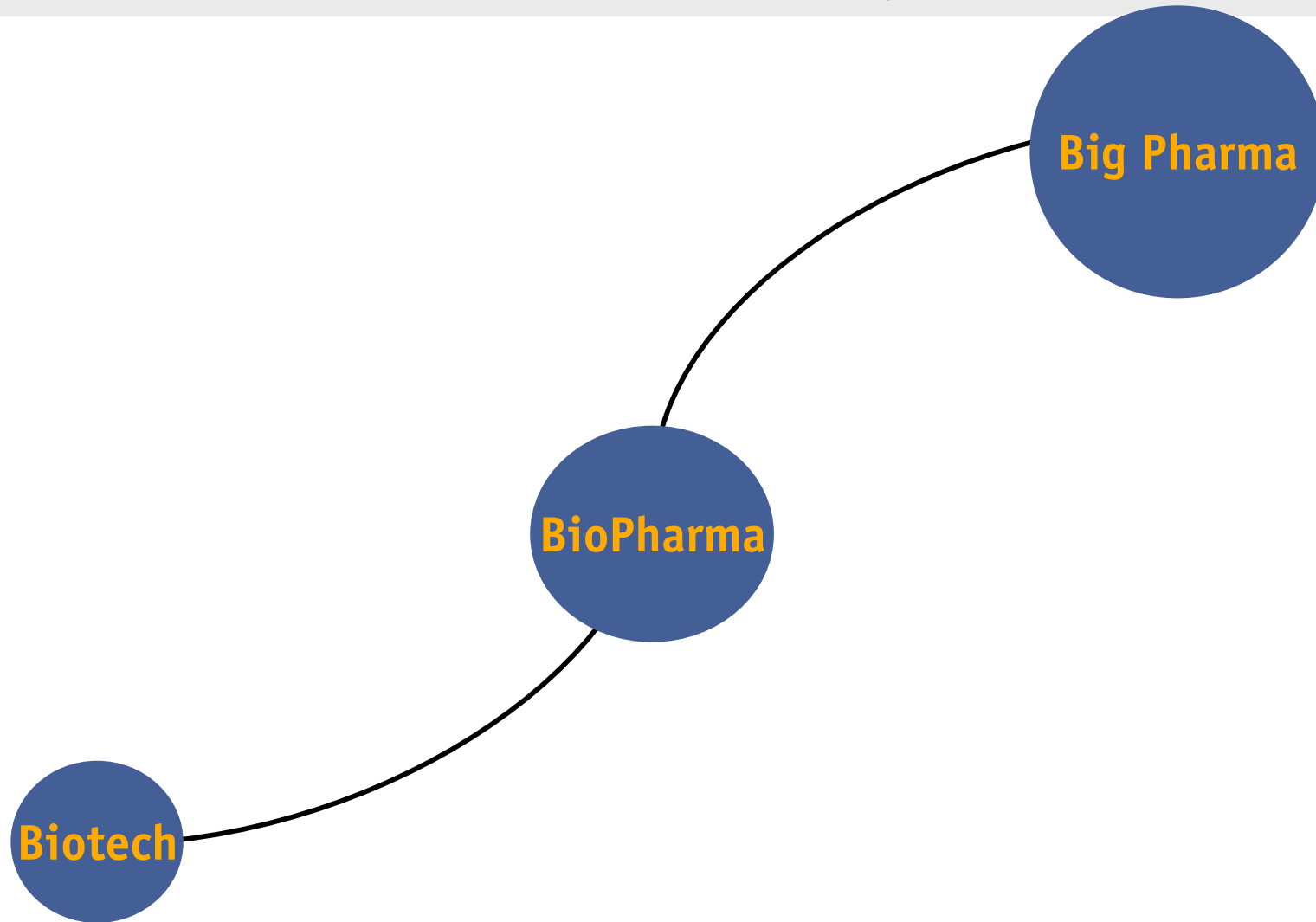
Big Pharmaceuticals - An Industry Fallen From Grace



3-Phase DCF Model - FCF Growth EU Universe



Healthcare Continuum - Risk Perceptions

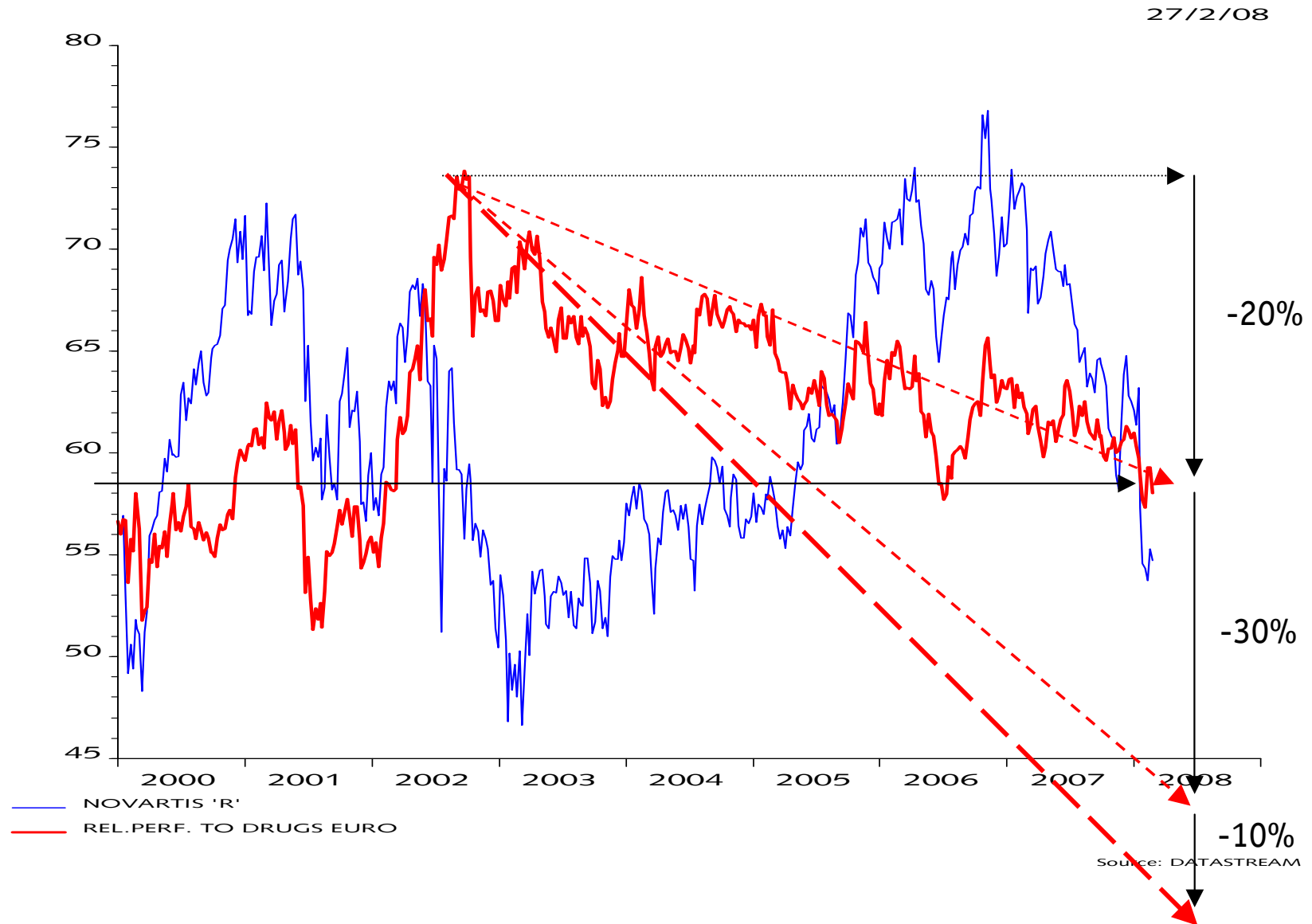


Assessing Quality of Growth - Appropriate Discount Rate

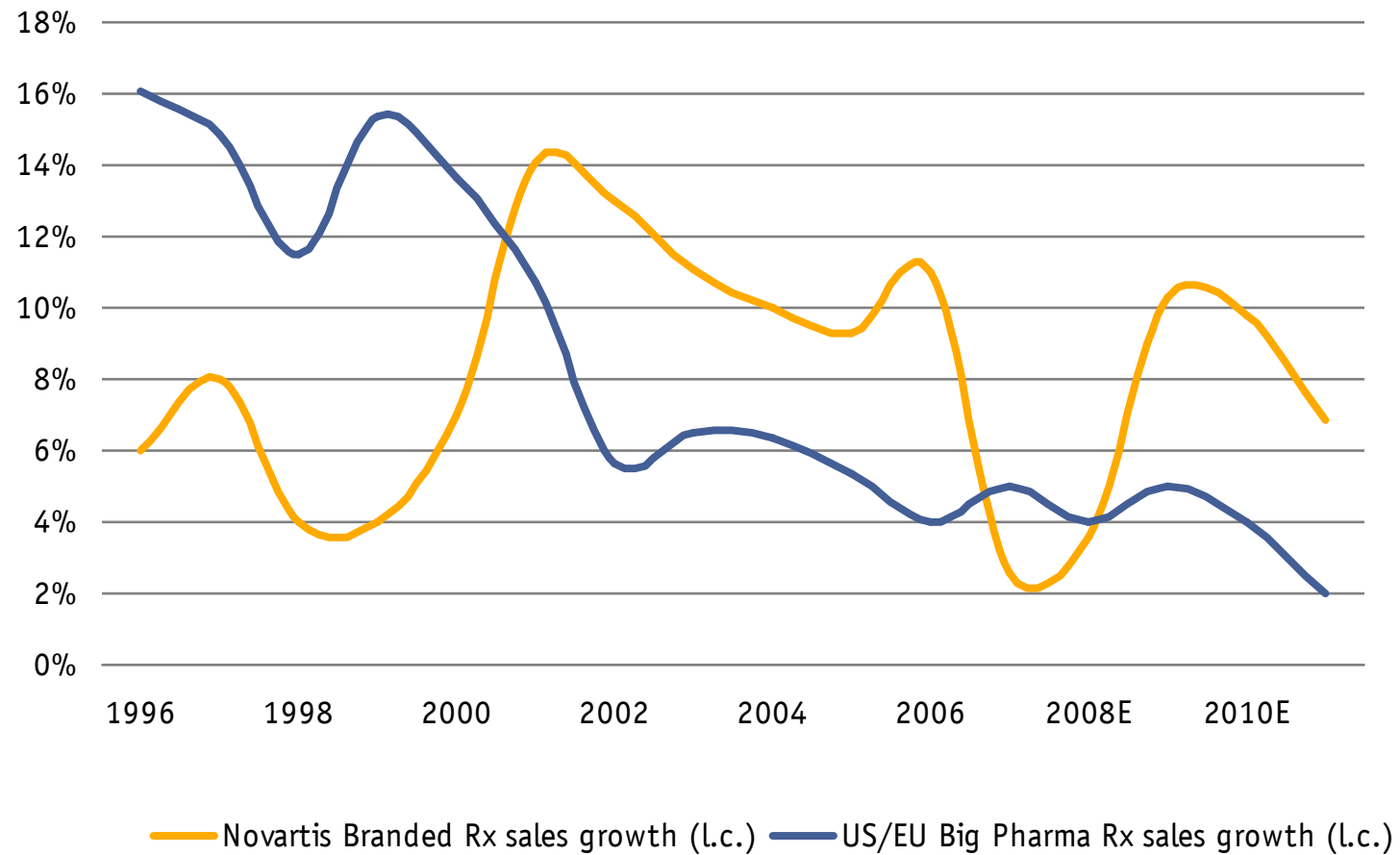
Low risk (++)/High risk (--)	++	+	0	-	--
Premium/Discount per quality characteristic	-0.40%	-0.20%	0.00%	0.20%	0.40%
	++ (significantly better than sector)	+ (better than sector average)	0 (sector average)	- (worse than sector average)	-- (significantly worse than sector)
Pipeline Potential or Portfolio Replacement Rate (Sum of probability-weighted peak sales of all pipeline projects expressed as % of current sales)	> 50%	40% - 50%	30% - 40%	20% - 30%	0% - 20%
Generic Exposure or Portfolio Rate at Risk (Sum of all sales losing patent protection in the coming 5 years expressed as % of sales)	10%	10% - 20%	20% - 30%	30% - 50%	above 50%
Incremental potential of base portfolio (Sales of the underlying base portfolio - not new, not at generic risk - as % of current sales)	> 36%	26% - 35%	16% - 25%	0% - 15%	< 0%
Therapeutic Leadership (Franchise strengths indicating high sustainability of future cash flows - Minimum 10% in USD 10 bn+ market segment)	3 leadership positions	2 leadership positions	1 leadership position	No leadership according to LODH definition, but among top 5 in 2 or more areas	No notable therapeutic franchise strength
Geographical Exposure (% of revenues in the profitable and higher growth US market)	> 60% US revenues	US revenues of 45% - 60%	US revenues of 30% - 45%	US revenues of 15% - 30%	US revenues of 0% - 15%
Business Diversification (% of revenues derived from prescription medicines (not vaccines, not blood plasma))	100% Rx revenues	75% - 99% Rx revenues	50% - 74% Rx revenues	25% - 49% Rx revenues	< 25% Rx revenues
TOTAL COMPANY-SPECIFIC RISK (PREMIUM (-)/ DISCOUNT (+)) (Negative risk premium is a bonus and increases the value by lowering the overall discount rate (Rf + Rm). Positive risk premium lowers the value by raising the overall discount rate)	Aggregate of premium quality characteristics on discount rate -2.4%	-1.2%	Aggregate of average quality on discount rate 0%	1.2%	Aggregate of discount quality characteristics on discount rate 2.4%

Special Situation - Novartis "Structurally Flawed" (Buy - PT: CHF 68)

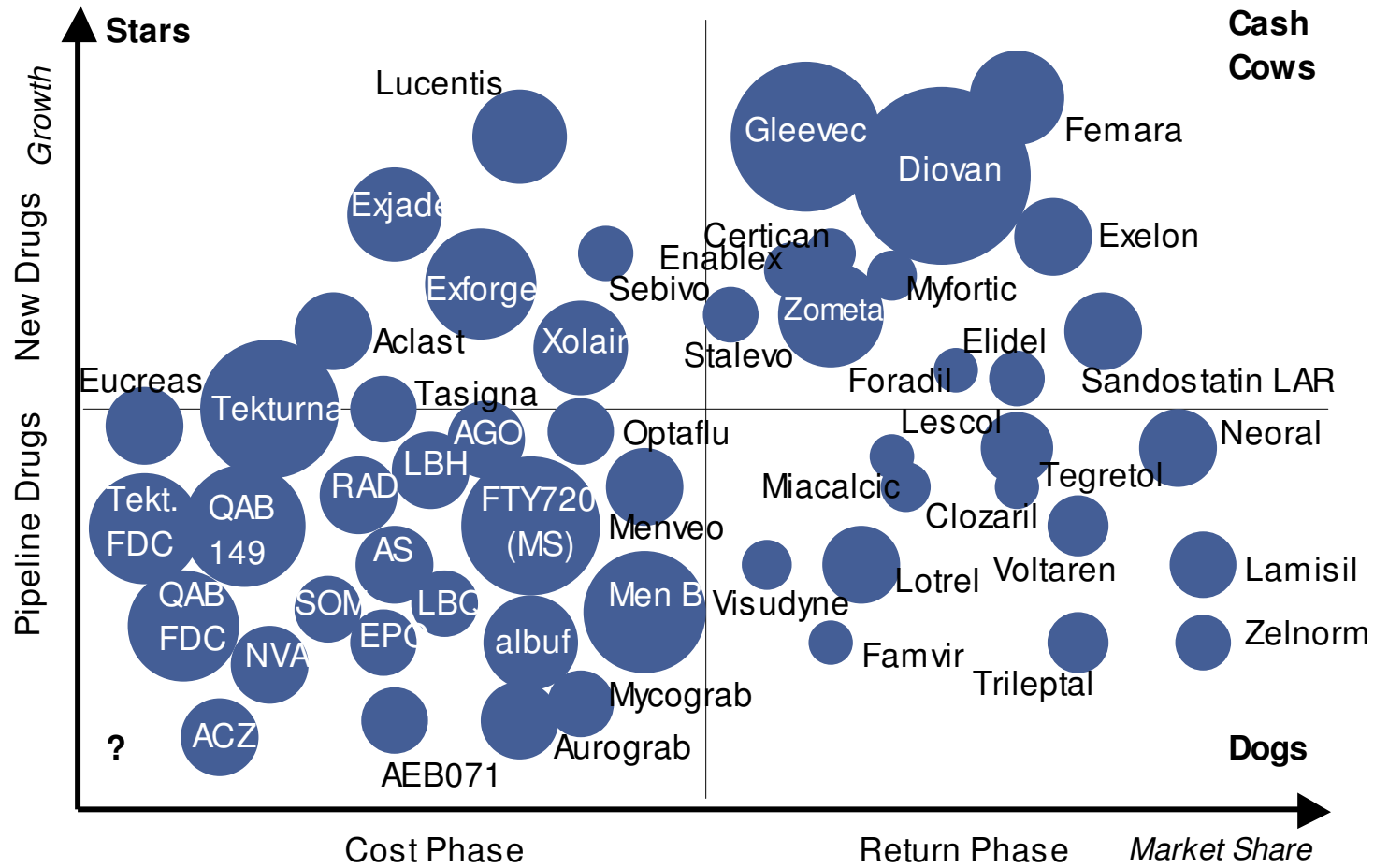
Novartis relative to MSCI Euro Pharma Index

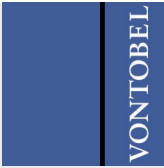


Novartis Branded Rx Outperforms a Declining Industry

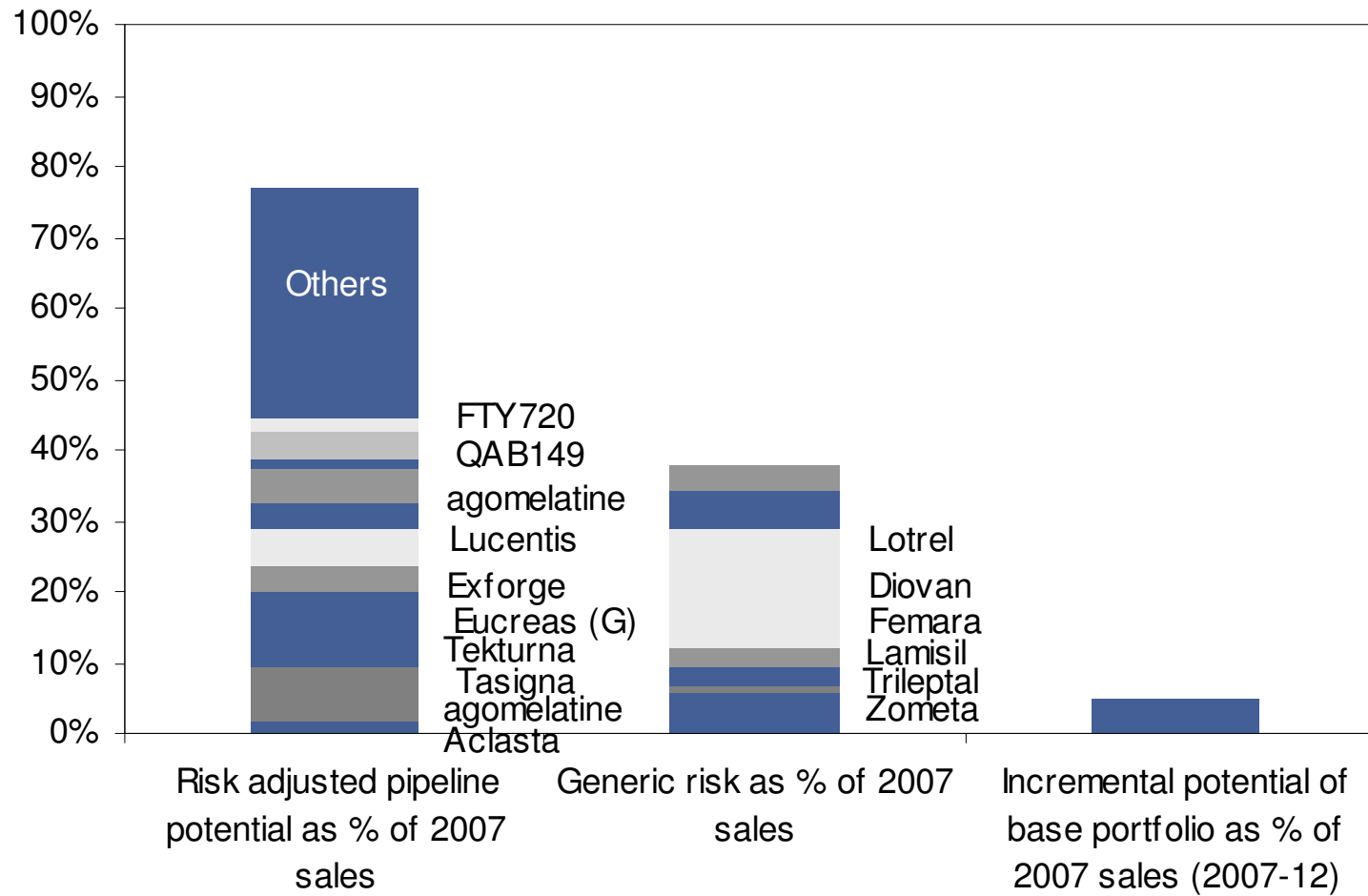


A Bird's View

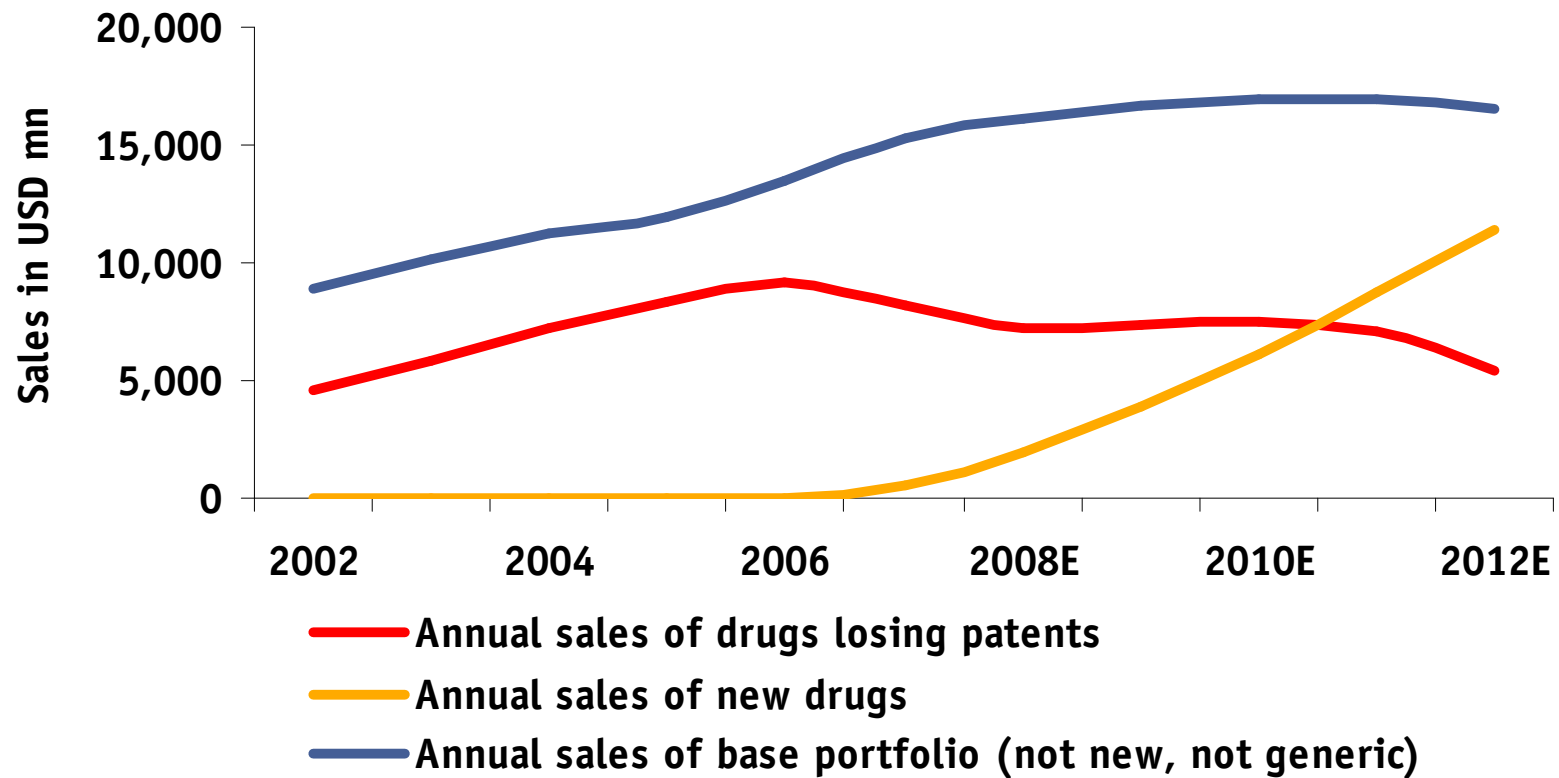




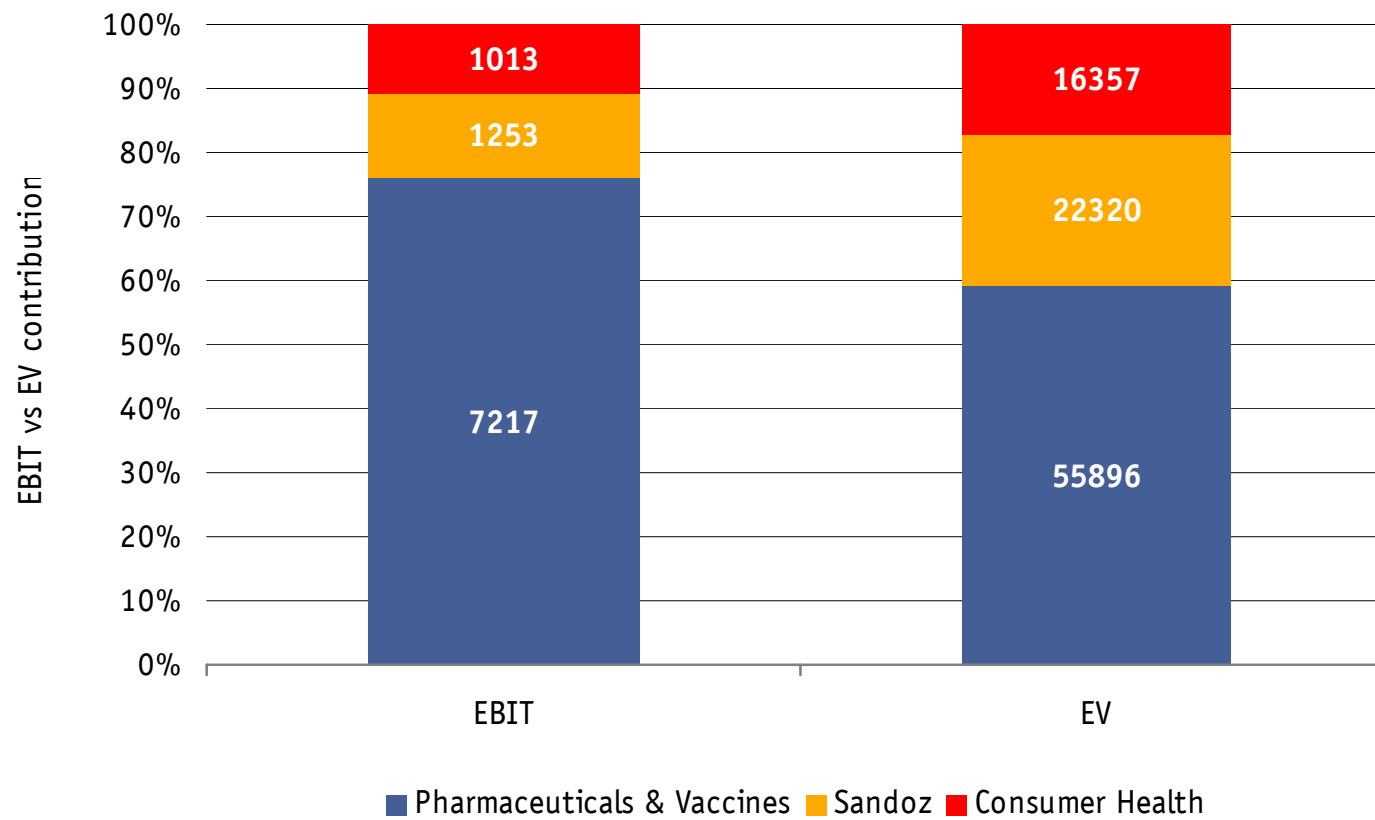
Structurally Sound ...



New Product Cycle - "Show Me The Money"



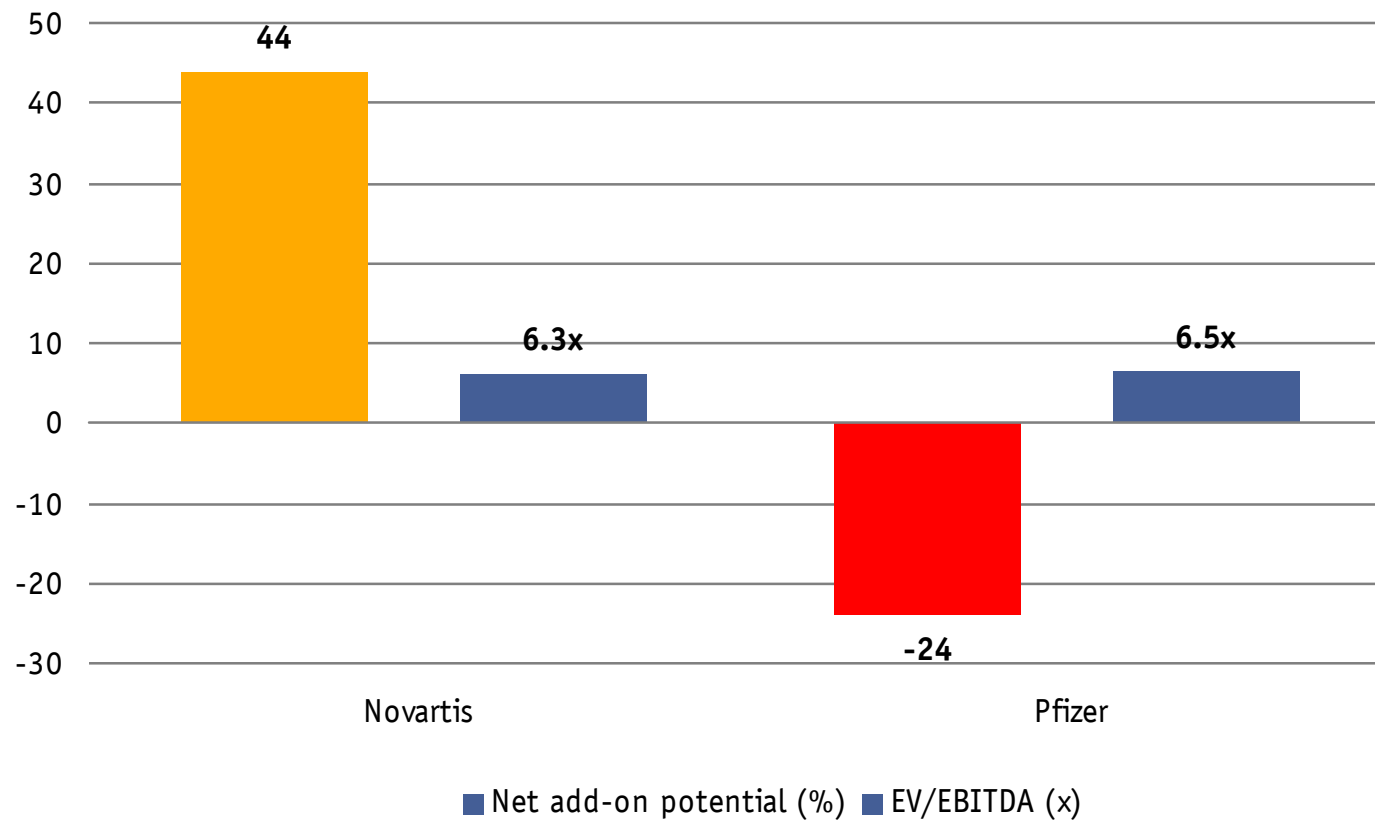
Valuation And Earnings Discrepancy



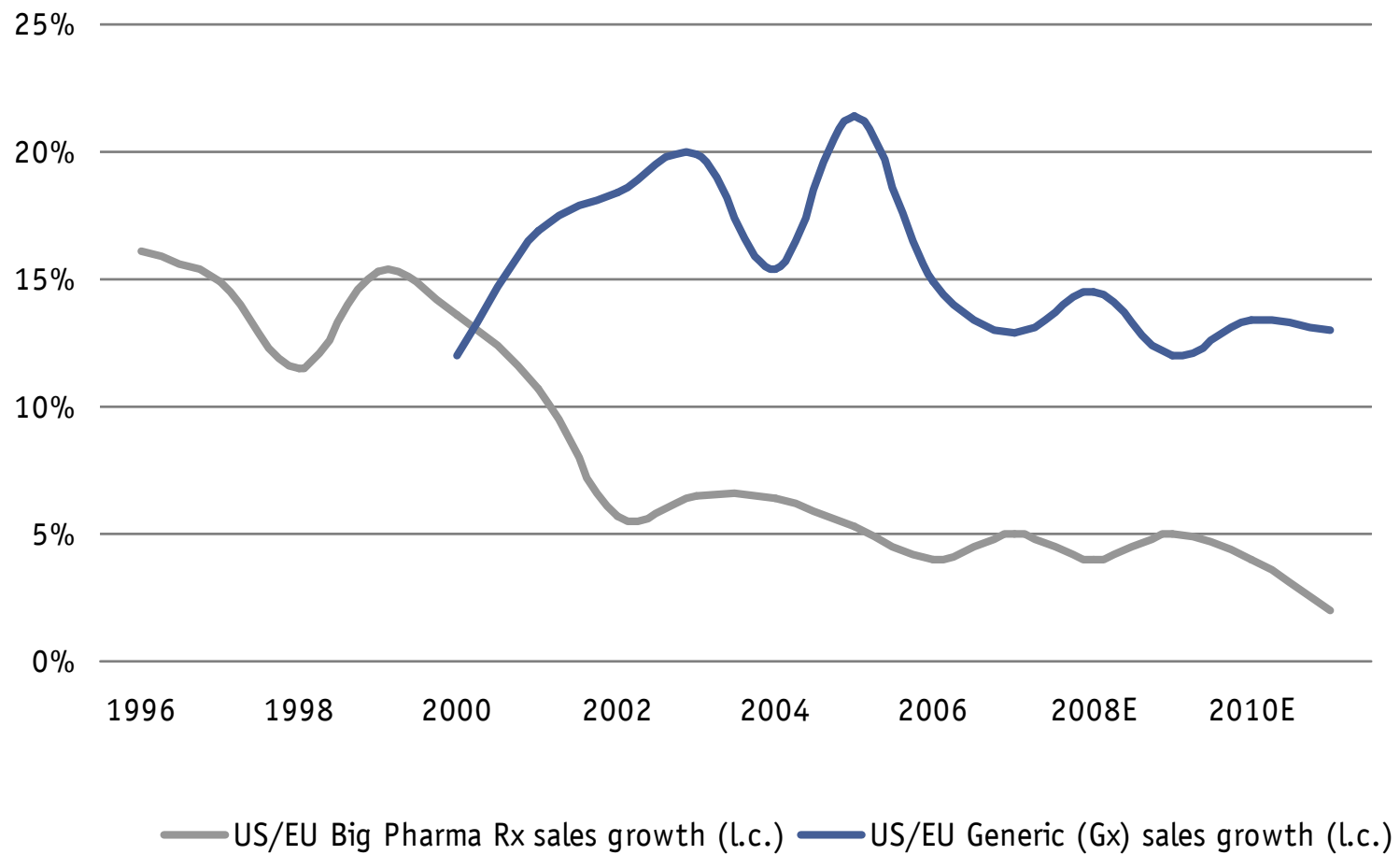
Back-Integrated Sum-of-Parts (SOP) Valuation

in million USD	2007	2008E
Novartis share price (in CHF)	50.8	50.8
Novartis share price in USD (Fx: 1.0)	50	50
Number of shares (diluted) *	2330	2287
Market Capitalisation	116500	114350
Net Cash *	7400	11457
Cash value of Roche equity holding (in USD)	11193	11193
Roche bearer share price (in CHF)	210	210
Nbe of Roche bearer shares owned by Novartis	53.3	53.3
Enterprise Value (EV)	97907	91700
Sandoz (generics) sales	7169	7972
Mean peer EV/Sales multiple	2.8x	2.6x
Implied EV (Sandoz)	20073	20726
Consumer Health (OTC, animal, vision) sales	5426	5842
Mean peer EV/Sales multiple	3.2x	3.0x
Implied EV (Consumer Health)	17363	17526
Corporate overhead EBITDA	-638	-468
Mean peer EV/cost	5.0x	5.0x
Implied EV (Corporate overhead)	-3190	-2340
Implied EV of Pharmaceuticals & Vaccines	63661	55788
Pharmaceutical sales	24025	25277
Vaccines (& Diagnostics) sales	1452	1646
Total Pharmaceuticals & Vaccines/Dx sales	25477	26923
Pharmaceutical EBITDA	7688	8368
Vaccine (& Diagnostics) EBITDA	448	485
Total Pharmaceutical and Vaccine/Dx EBITDA	8136	8853
Implied Pharmaceuticals & Vaccine/Dx EV/Sales (x)	2.5x	2.1x
Mean peer sector EV/Sales multiple	3.5x	2.8x
Discount Novartis versus peers	-28%	-26%
Implied Pharmaceuticals & Vaccine EV/EBITDA (x)	7.8x	6.3x
Mean peer sector EV/EBITDA multiple	11.5x	8.5x
Discount Novartis versus peers	-32%	-26%

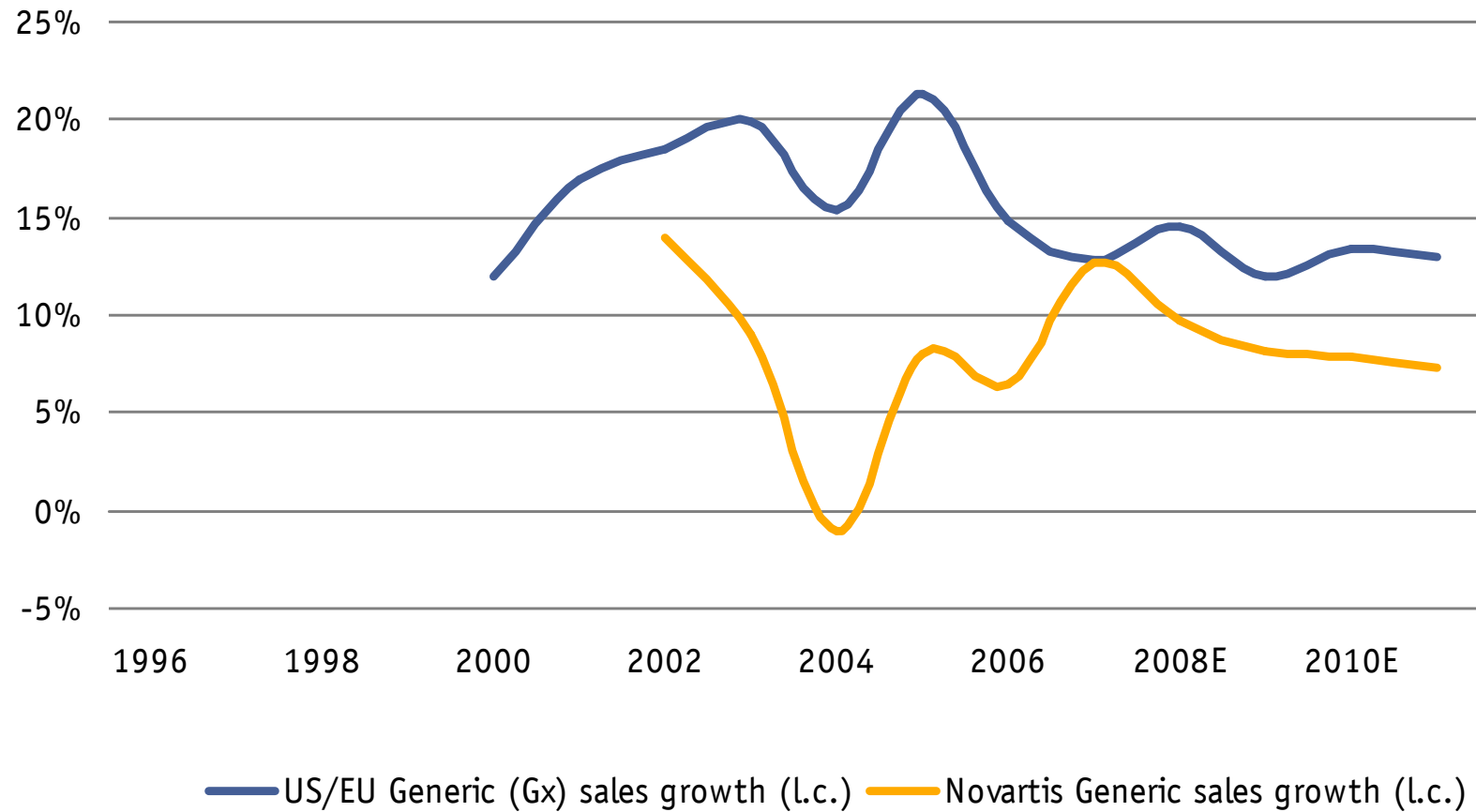
Novartis - A Takeover Target?



Big Pharma's Pain is Generic's Gain

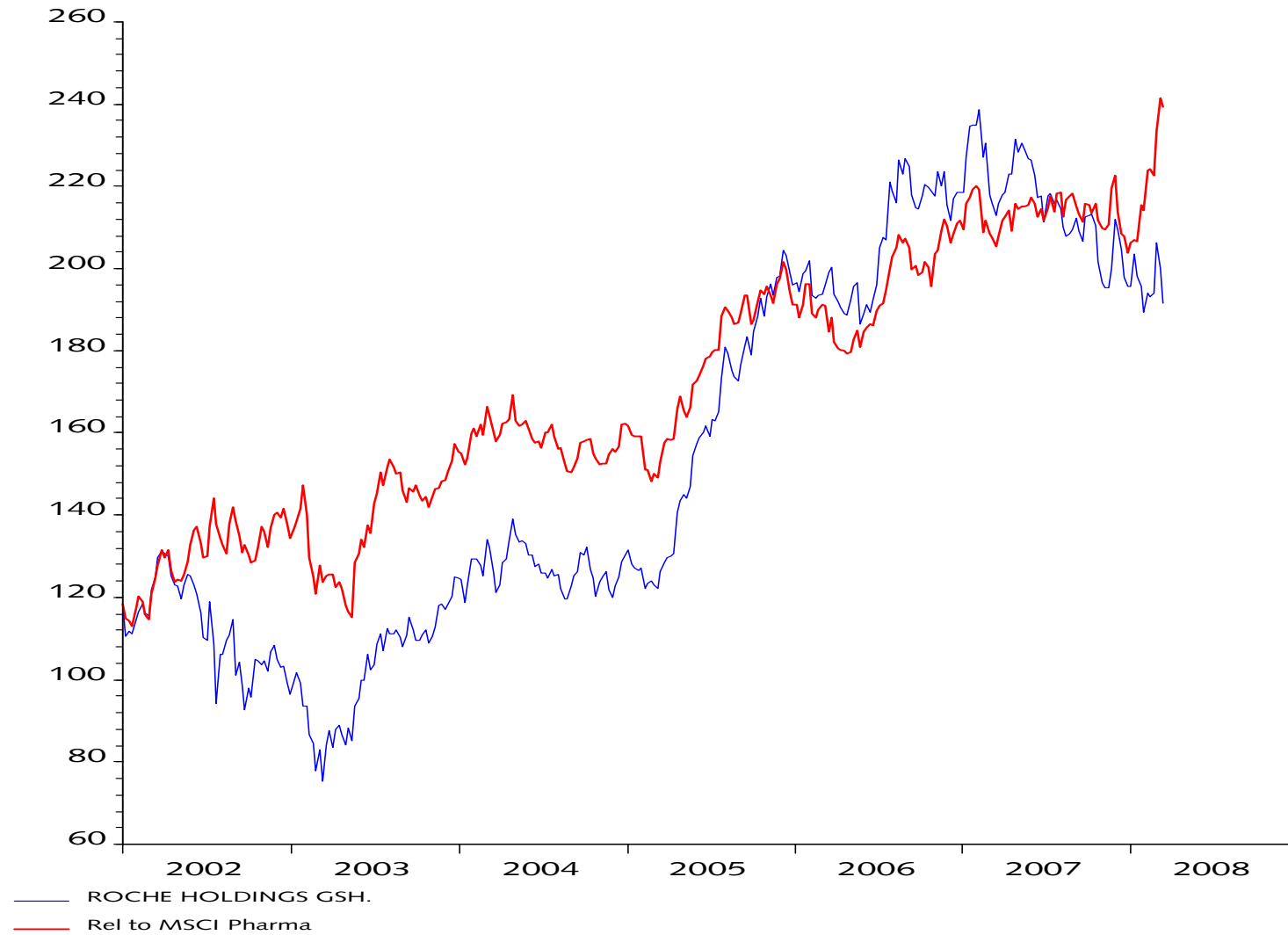


Market Does Not Appear to Value Sandoz (Generics) Due To Potential "Conflict of Interest"



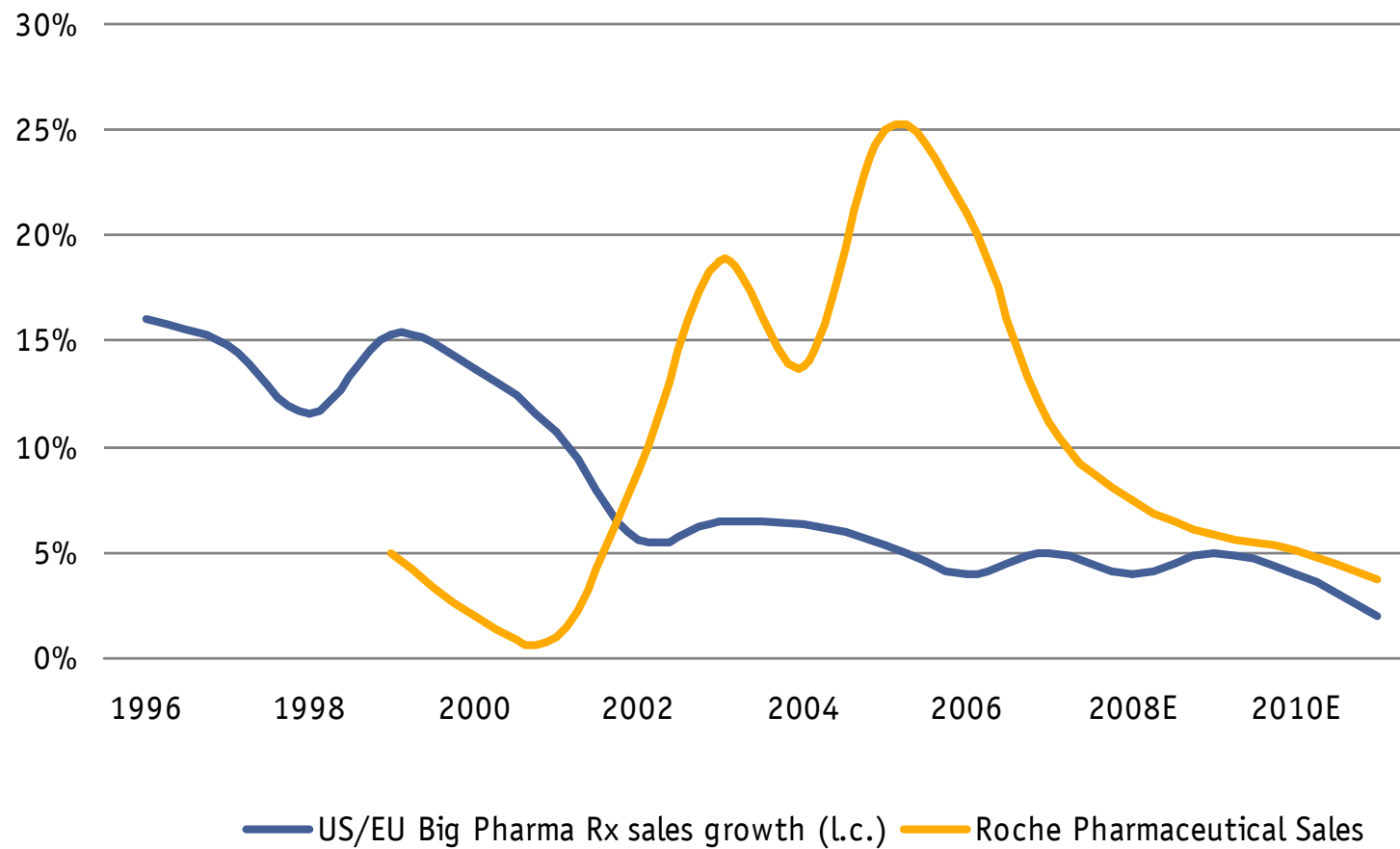
Special Situation - Roche "High on DNA" (Buy - PT: CHF 235)

Roche NVES relative to MSCI European Pharmaceuticals

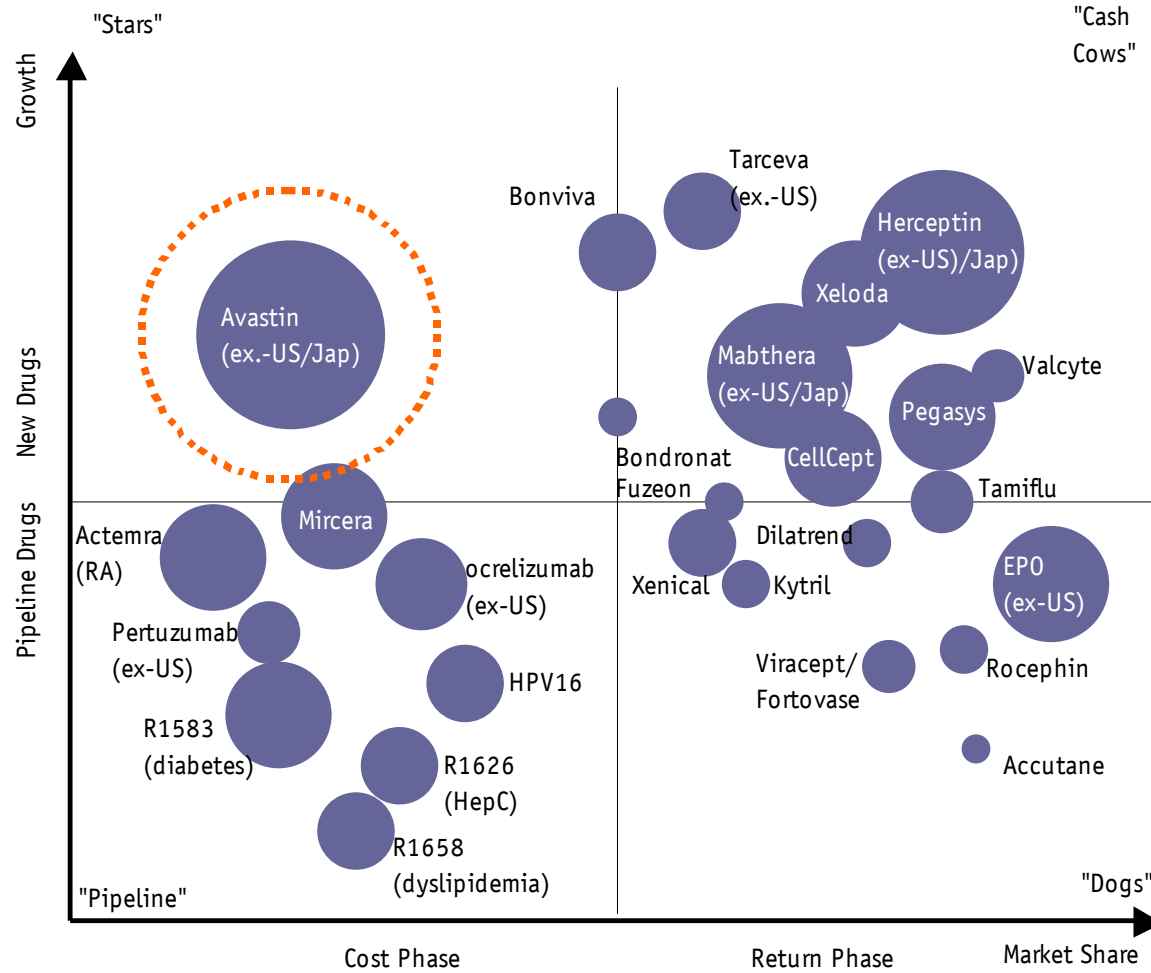


Source: DATASTREAM

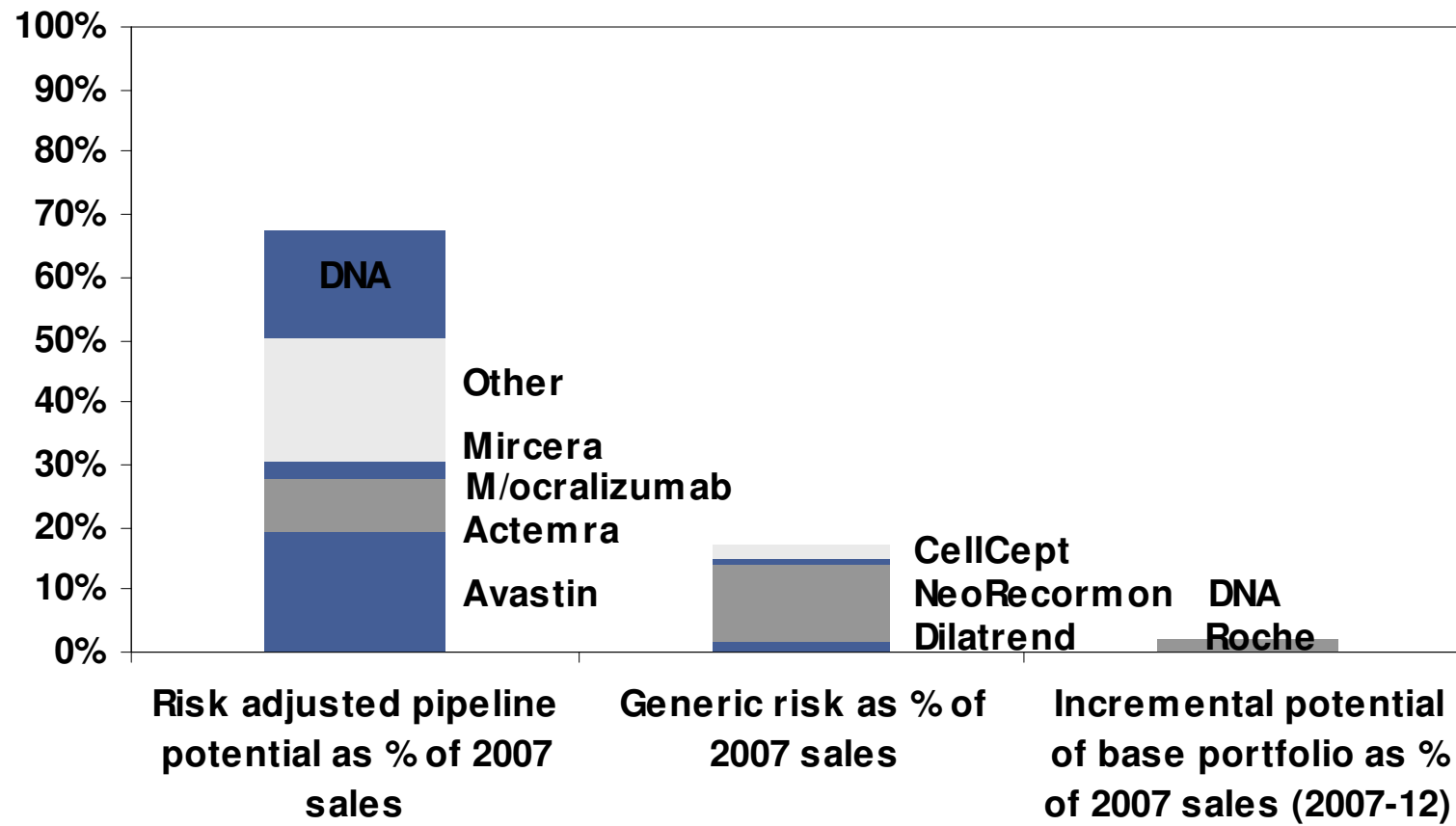
Roche Rx Substantially Outperforms Peers



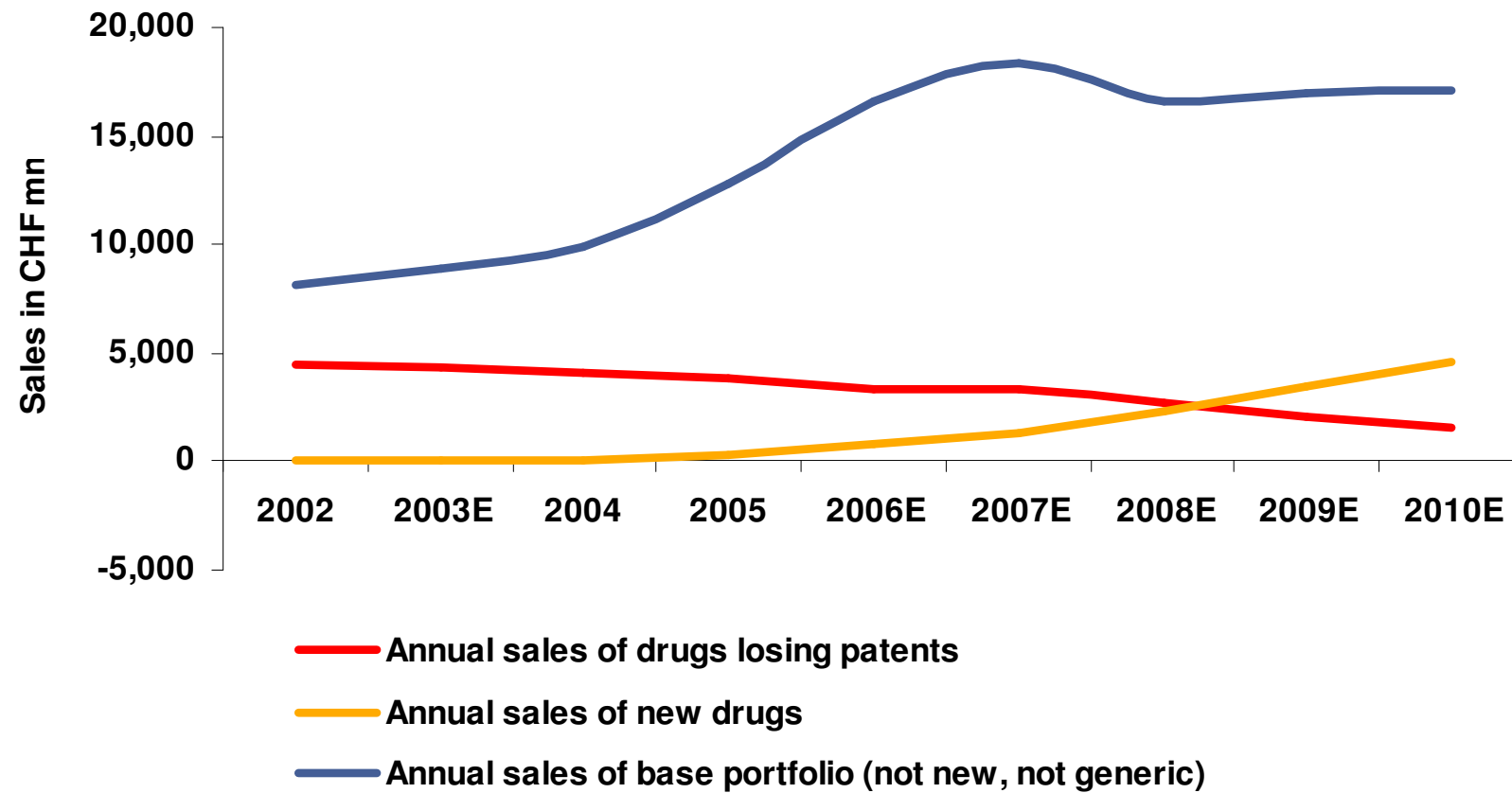
Substantially Scalable...



Structurally Sound ...



New Product Cycle - "Show Me The Money"



Back-Integrated Sum-of-Parts (SOP) Valuation

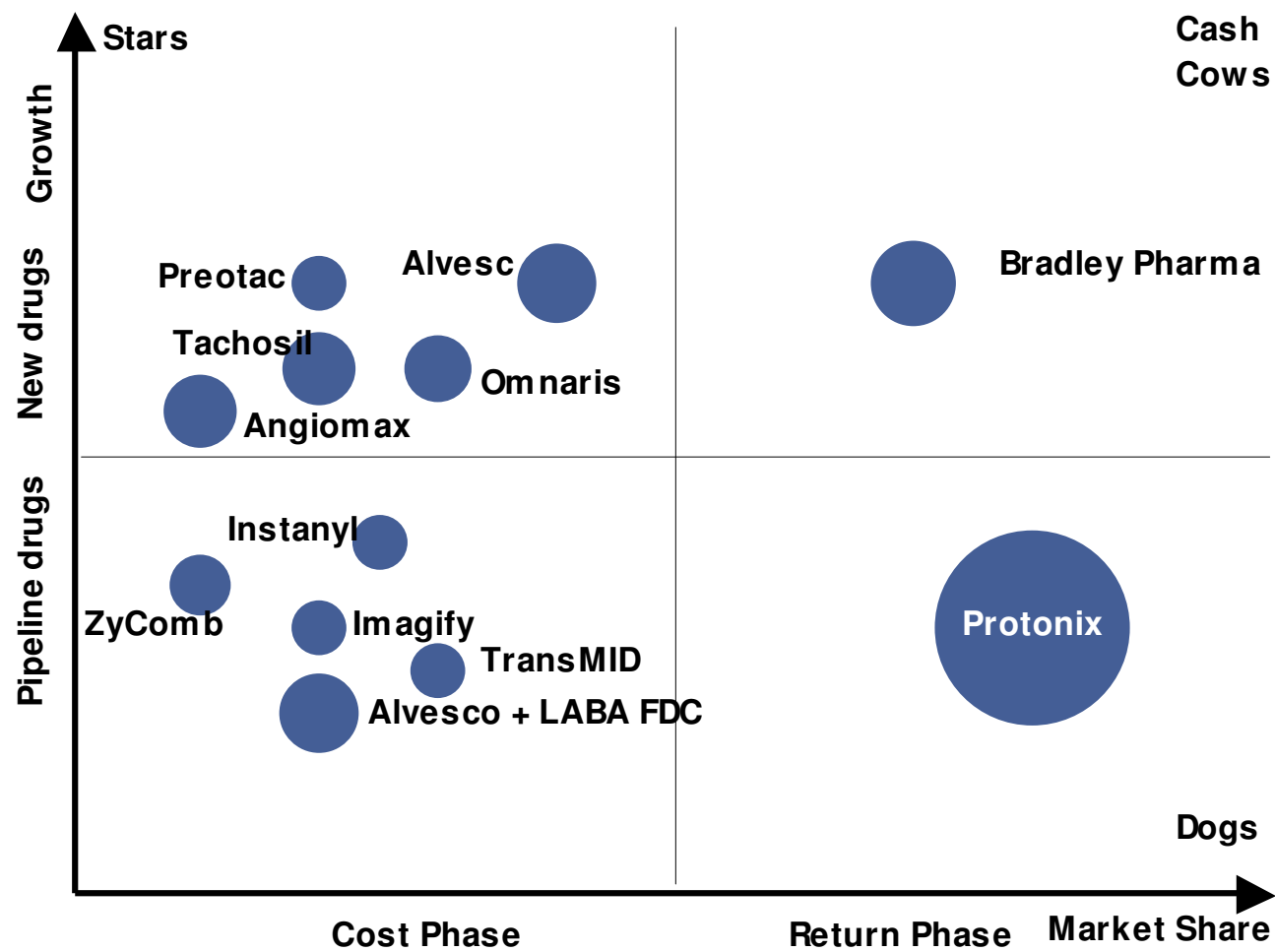
	Price	Nbe of shares	Market Cap
Roche NVES + Bearer			
NVES	191	699	133509
Bearer	210	160	33616
Total in CHF mn			167125
Genentech (DNA) (in USD)			
	81	1070	86670
FX			1.0
DNA in CHF mn			86670
Roche ownership (56%)			48535
Chugai (Japan)			
	1087	551	598937
Fx			1.01
Chugai in CHF mn			5930
Roche ownership (51%)			3024
"Equity value" of underlying Roche (CHF mn)			115566

	2005	2006	2007	2008E
Net cash owned by Roche (90% of total)	8163	12286	15041	18619
Enterprise value (EV; CHF mn)	107403	103279	100525	96946

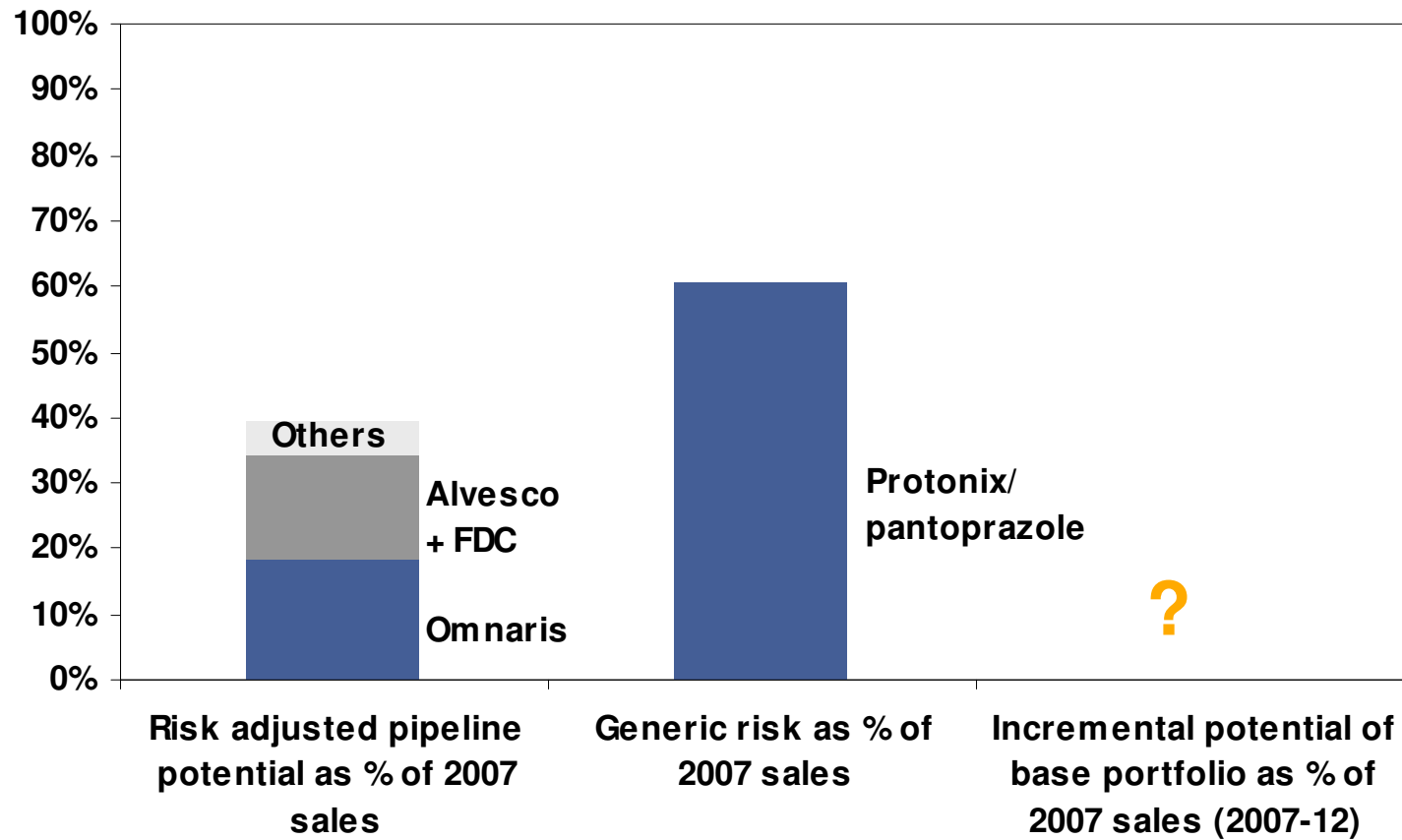
	2005	2006	2007	2008E
Roche Rx and Dx Sales	23,962	28,101	30,918	32,331
Implied sales multiples	4.5x	3.7x	3.3x	3.0x
Global sector mean	3.8x	3.6x	3.5x	2.8x
Premium (Discount)	18%	2%	-7%	7%
Roche Rx and Dx EBITDA	7796	9035	10569	11513
Implied EBITDA multiple	13.8x	11.4x	9.5x	8.4x
Global sector mean	12.6x	11.5x	10.5x	8.5x
Premium (Discount)	9%	-1%	-9%	-1%

Nycomed "Life After Pantoprazole"

Preparing for Life Beyond Pantoprazole...



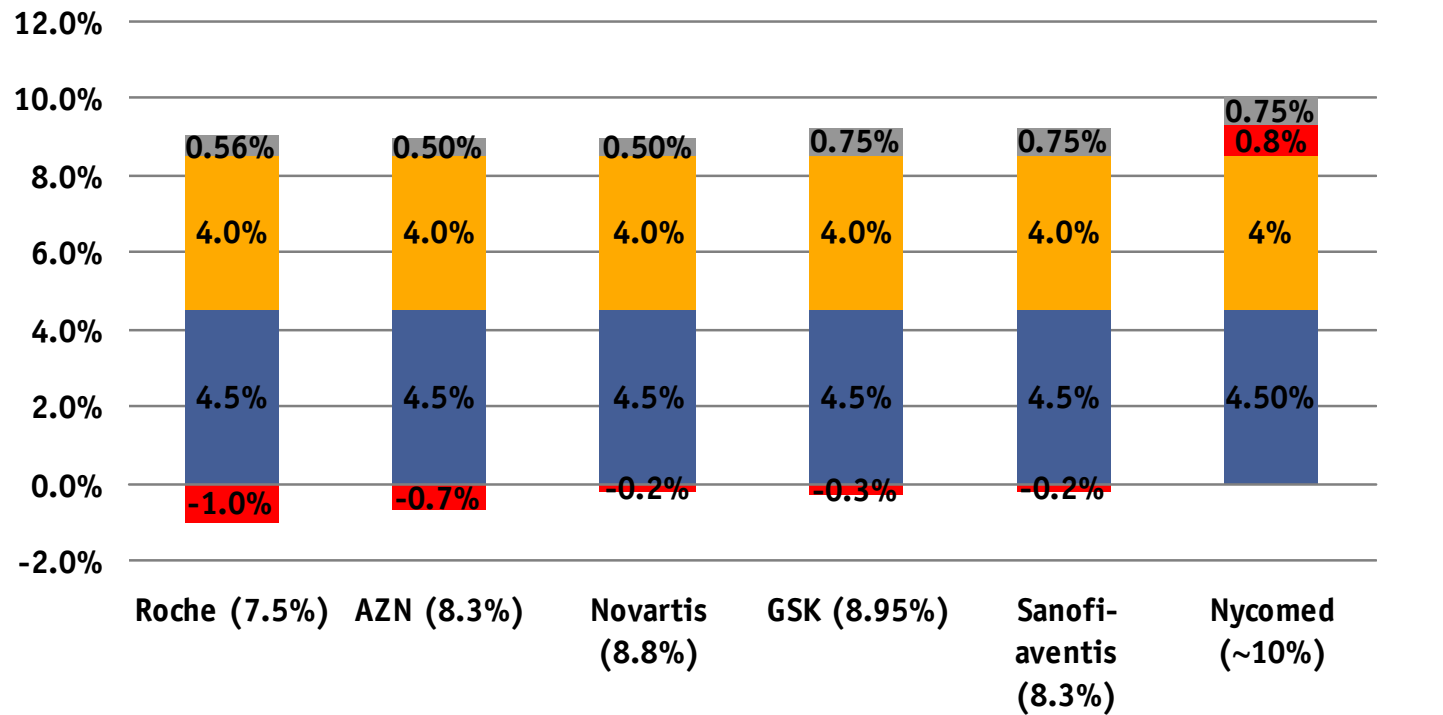
Overcoming the Pantoprazole Patent Overhang...



Risk Profiling of Nycomed

Risk Grade	5 (low risk)	4	3	2	1 (high risk)
Pipeline Potential (Portfolio replacement rate)	50% or more	>= 30% - 50%	>= 15% - 30%	0 to 15%	0
(Sum of probability weighted value of pipeline projects / current sales base)	-0.40%	-0.20%	0.00%	0.20%	0.40%
Generic Risk (Portfolio rate at risk)	<= 10%	>= 10% - 20%	>= 20% - 30%	>= 30% - 50%	above 50%
(Sales at risk of losing patents in coming 5 years at 100% / current sales base)	-0.40%	-0.20%	0.00%	0.20%	0.40%
Incremental potential of underlying portfolio	> 36%	26% - 35%	16% - 25%	0% - 15%	< 0%
(Sales of the underlying product portfolio - not new, not at risk of patent loss - as % of current sales)	-0.40%	-0.20%	0.00%	0.20%	0.40%
Therapeutic Leadership	3 leaderships in therapeutic groups of average size \$10bn+	2 leaderships in therapeutic groups of average size \$10bn+	1 leaderships in therapeutic groups of average size \$10bn+	No leadership + among top 10 in 3 therapeutic groups	No leadership and not among top 10 in 3 therapeutic groups at least
(Based on world market shares and serves as an indicator of a company's success in franchise building, ie., knowledge building)	-0.40%	-0.20%	0.00%	0.20%	0.40%
Geographical Exposure	US sales of 60% or more	US sales of > 45%	US sales of > 30%	US sales of > 15%	US sales of < 15%
(% of sales (direct and indirect sales) in the fast growing "free" US market)	-0.40%	-0.20%	0.00%	0.20%	0.40%
Business Diversification	100% of sales from prescription drugs	> 75% of sales from prescription drugs	> 50% of sales from prescription drugs	> 25% of sales from prescription drugs	< 25% of sales from prescription drugs
(% of sales derived from prescription drugs)	-0.40%	-0.20%	0.00%	0.20%	0.40%

What Would an Appropriate Discount Rate for Nycomed Be?



■ Risk free ■ Market risk premium ■ Company spec. Risk premium ■ Pipeline risk premium

Remember ... Valuation is Not Strictly a Science But More Like an Art !



**"Not everything that can be counted counts and not everything that counts can be counted"
(Albert Einstein)**