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Agenda

- Market Overview
- Clinical and Economic Value Propositions
- Economics & Pricing Considerations
- “Value Based” Framework for Purchasers

Despite numerous mega-mergers, "Big Pharma" remains a highly fragmented industry

Rank	Company	2006 Sales ($MM)	Growth (%)	Market Share (%)
1	Pfizer	45,083	1.8	7.2
2	GlaxoSmithKline	37,034	9.7	5.9
3	sanofi aventis	35,638	5.0	5.7
4	Novartis	28,880	18.0	4.6
5	Roche	26,596	21.8	4.2
6	AstraZeneca	25,741	10.5	4.1
7	Johnson & Johnson	23,267	4.2	3.7
8	Merck	22,636	2.8	3.6
9	Wyeth	15,683	2.4	2.5
10	Eli Lilly	14,814	7.5	2.4
--	All Other	624,993	N/A	56.1

Consolidation has yet to produce meaningful operating efficiencies

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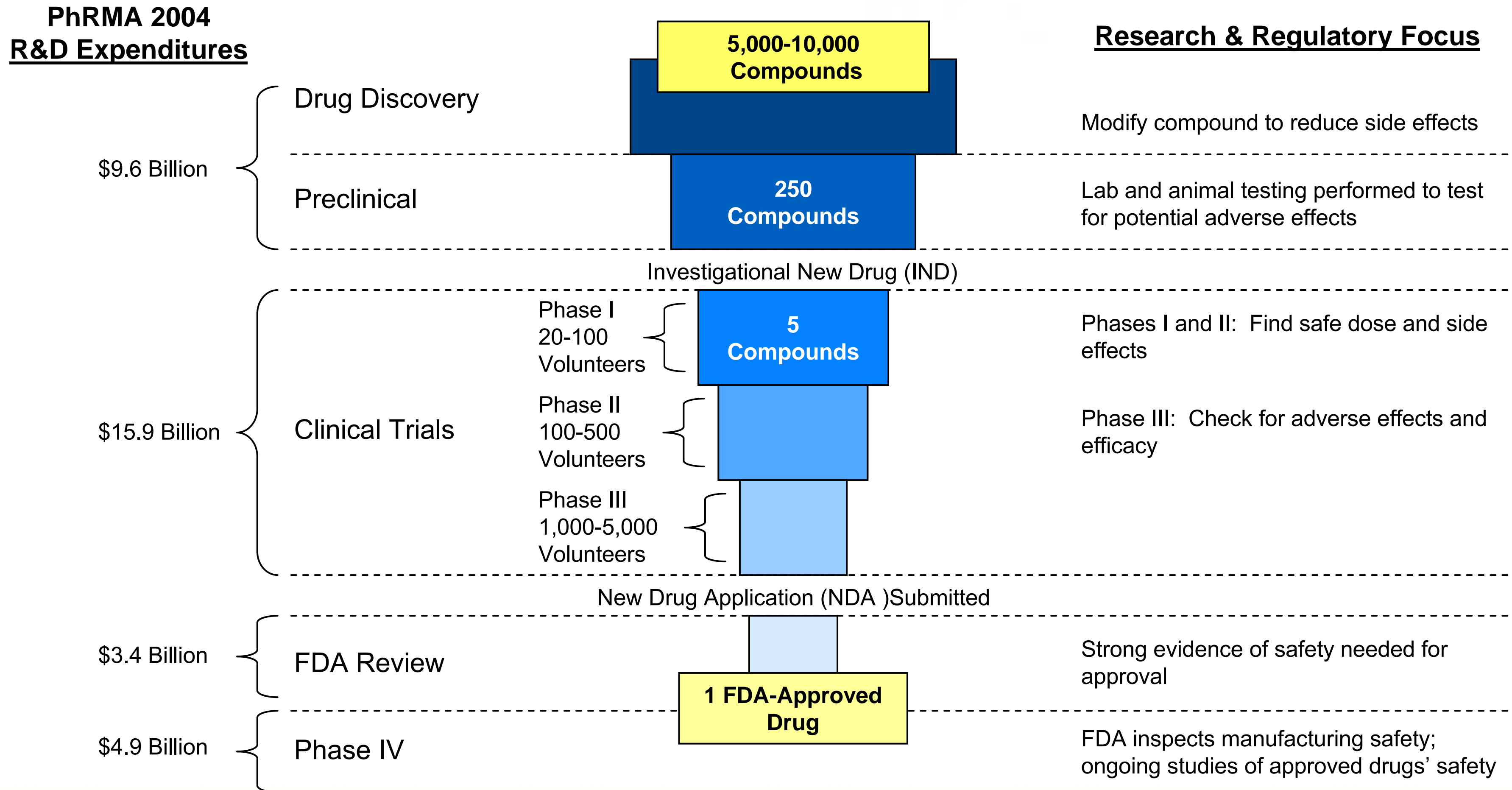
For every 5,000-10,000 drug candidates discovered, only 1 is eventually cleared for marketing



Sources: PhRMA Survey, Tufts

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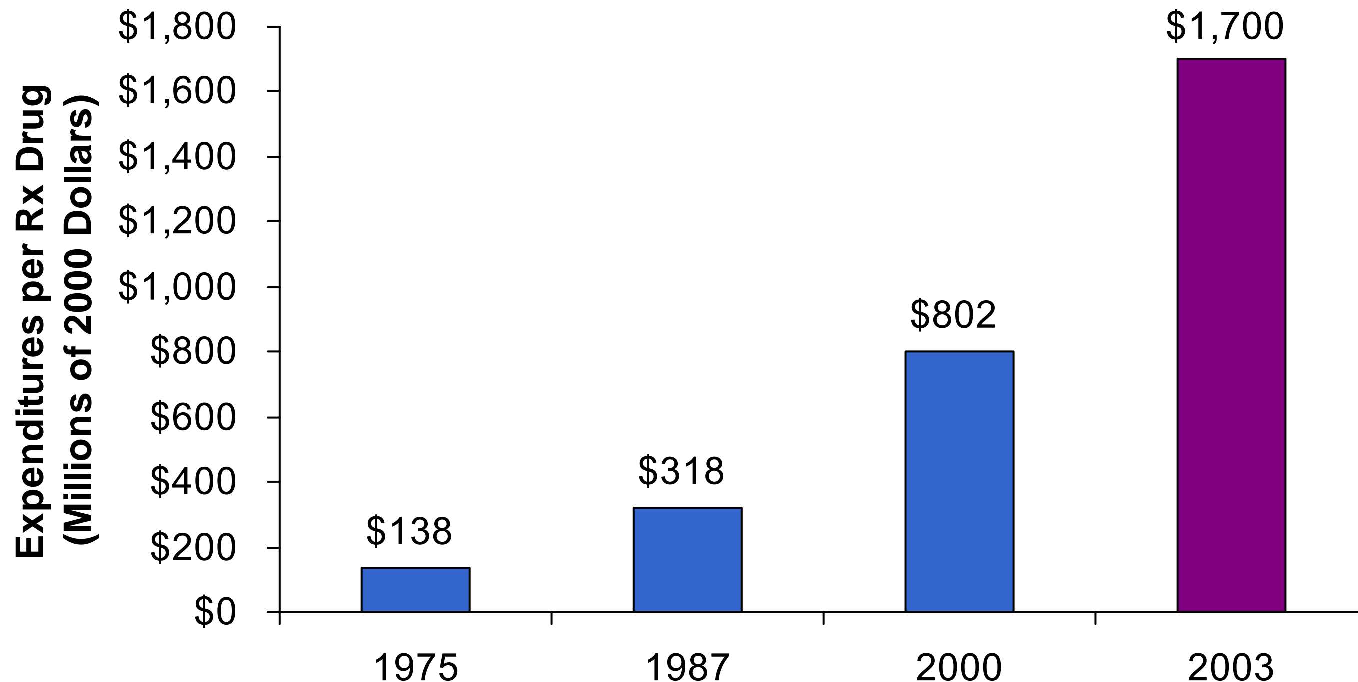
Cost to Develop a New Drug or Biological

Drug development is costly, though estimates and methodologies vary



Source: J.A. DiMasi, R.W. Hansen, and H.G. Grabowski, "The Price of Innovation: New Estimates of Drug Development Costs," *Journal of Health Economics* 22 (2003): 151-185.

Source: A. Singh, et. al. Bain & Co. Research Report, 2003

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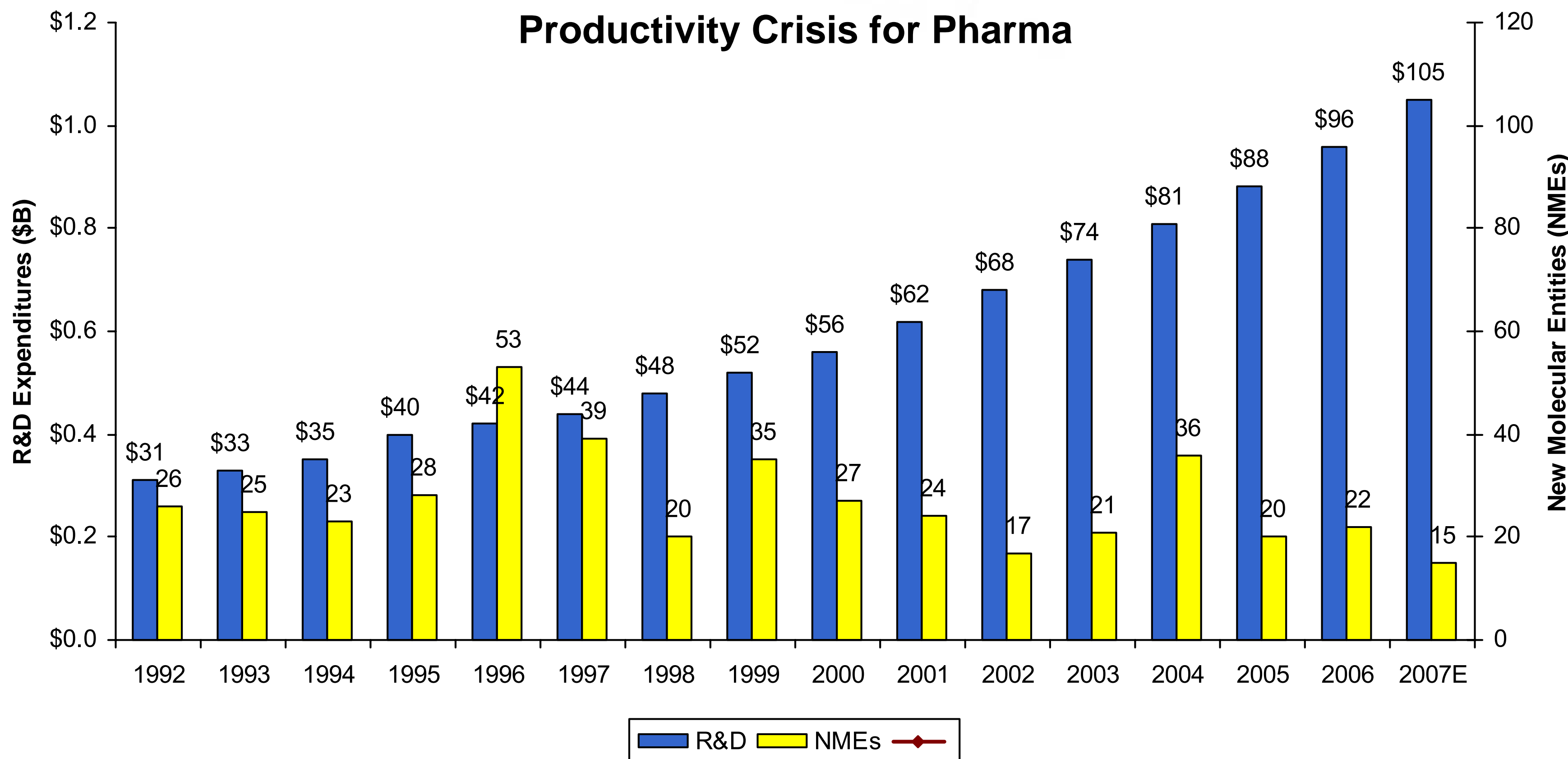
The industry's R&D model appears unsustainable..



*Beginning in 2004, NMEs approved include new Biologic License Applications (BLAs)
Sources: FDA, Reuters, "The Pink Sheet," and William Blair & Company, L.L.C. estimates

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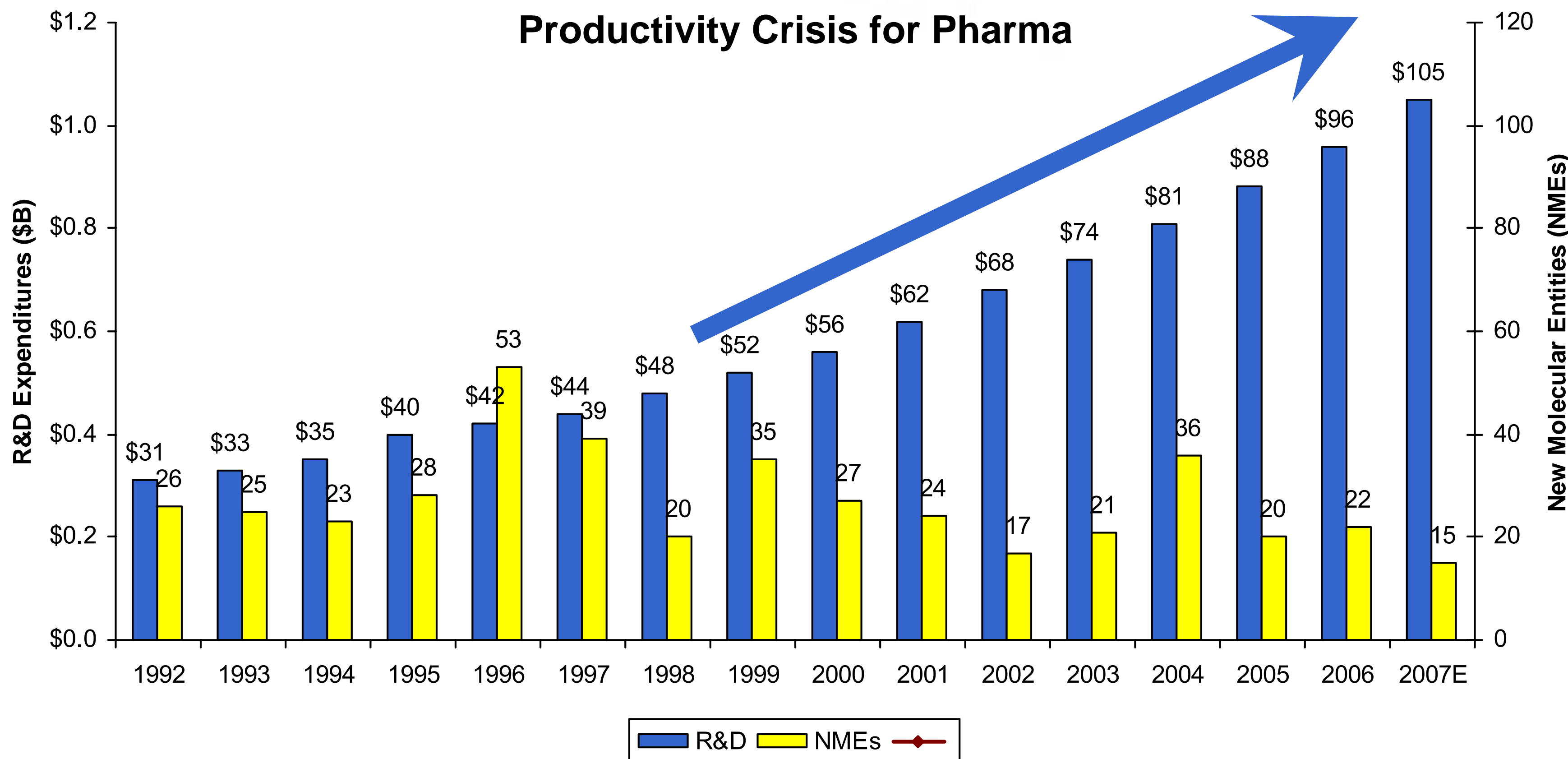
…as higher expenditures ….



*Beginning in 2004, NMEs approved include new Biologic License Applications (BLAs)
Sources: FDA, Reuters, "The Pink Sheet," and William Blair & Company, L.L.C. estimates

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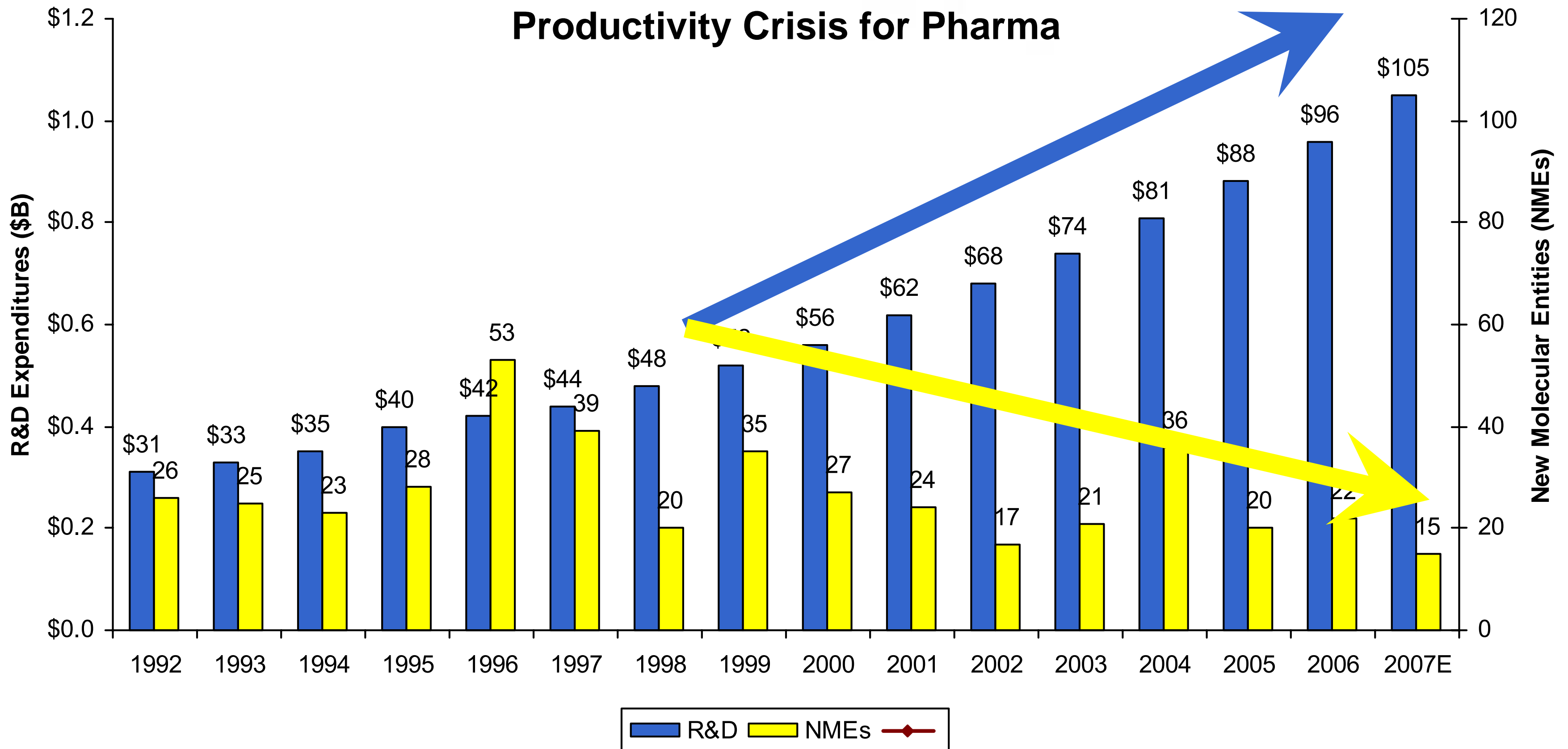
… are yielding fewer innovative products



*Beginning in 2004, NMEs approved include new Biologic License Applications (BLAs)

Sources: FDA, Reuters, "The Pink Sheet," and William Blair & Company, L.L.C. and Covance estimates

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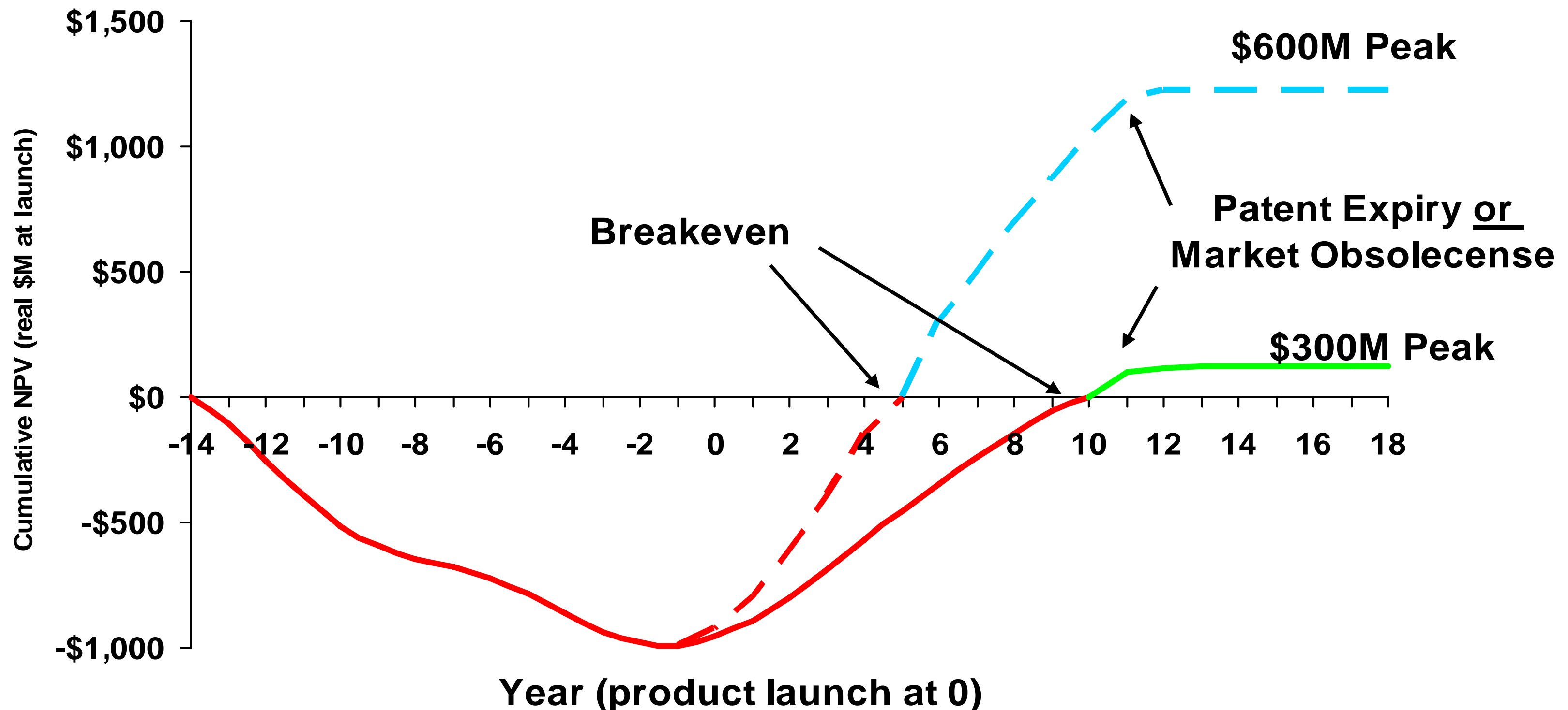
Fast followers, product withdrawals, pricing pressures, and patent expirations all affect pharmaceutical ROI



Note: Assumes modeled costs, peak sales as shown, 8% discount rate.

Sources: PERI, Lehman Brothers and Tufts

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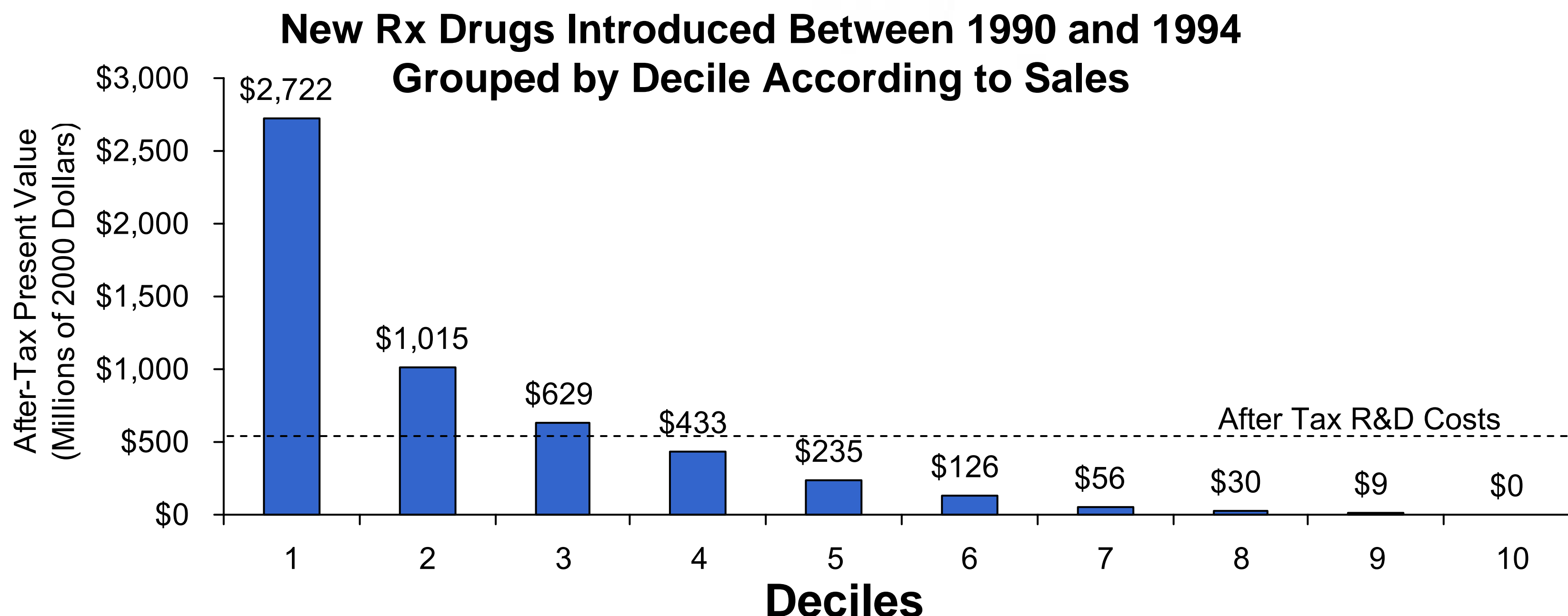
Only 30% of drugs that reach market the market ever fully recoup their development costs



Source; H. Grabowski, J. Vernon, and J. DiMasi, "Returns on Research and Development for 1990s New Drug Introductions," *Pharmacoeconomics* 20 9December 2002): suppl. 3, 11-29.

Pharma has been relying on the "blockbuster" sales to fund its R&D, but science is moving toward targeted, "personalized" therapies

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Manufacturers consider clinical, economic, and other inputs when pricing individual products

- Existing/Alternative Therapies
  - Cost and effectiveness of alternative drugs
  - Other Treatment Modalities (e.g., surgery)
- No Existing Therapy --Burden of Illness
  - Direct Medical Costs
  - Indirect Costs
- Other Factors
  - Externalities (e.g., liability, public perception)
  - Size of Market
  - Elasticity of Demand & Willingness-to-Pay
  - Pricing Model

A number of factors affect willingness-to-pay, elasticity of demand, and thus pricing

Characteristics of Drug/Disease/Patients	**Degree of Price Sensitivity**	
	High Sensitivity/ Lower Prices	Lower Sensitivity/ Higher Prices
Chronicity of Therapy	Chronic	Acute
Disease Prevalence	High	Low
Disease Severity	Minor	Serious/Fatal
Symptom Severity	Asymptomatic	Symptomatic
Patient Age	Older	Younger
Route of Administration	Oral	Injectible
Mode of Production	Inorganic/Chemical	Biotechnology
Market Dynamics		
Availability of Alternatives/Substitutes	Many	Limited/None
Differential Safety and/or Effectiveness	Small/Unclear	Large/Clear
Offsetting Cost Savings	Low	High

Adapted from: N, Gregson, N, et. Al. “Pricing Medicines: Theory and Practice, Challenges and Opportunities.” *Nature Reviews*. 4:2005, 121-130

Manufacturers use a various mechanisms to manage the prices to paid by various constituencies

Market Situation	Pricing Mechanism
Encouraging physicians and patients to try a product	■ Free samples ■ Discount Coupons & Rebates
High-volume purchasers can re-direct market share	■ Discounts ■ Volume-based rebates
Patients who lack insured for drugs	■ Patient assistance programs offer free drug to qualified patients
Patients with insurance who still face high co-payment burdens	■ Donations to co-payment assistance foundations

Other industries with high fixed costs (e.g. airlines, wireless telephony) generally employ more complex mechanisms for variable pricing

At the micro level, "value" is reflected in through some existing pricing mechanisms

Situation	Pricing Goal & Mechanism	Issues
Individual Dose Titration • Hypertensive medications • HIV medications	■ Manage "$/day of therapy" ■ Non-linear pricing: □ 1 mg - $1.00 □ 2 mg - $1.10 □ 3 mg - $1.25	■ Rarely used in liquid formulations ■ Pill-splitting now common among oral therapies
Disparate Dosing by Indication • INF-α • Avastin • Vectibix • Buproprion • VEG-F products	■ Manage value across low- and high-dose indications ■ Price cap program □ Specific $ level □ % of income ■ Develop 2 products/brands □ Wellbutrin/Zyban (bupropion) □ Avastin/Lucentis (VEG-f)	■ Price cap is generally tied to spending, not outcome ■ Therapeutic substitution still happens

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Paying for Value: Payer-Centric Models

Payer-Driven Models	Positives	Drawbacks
"4th Hurdle" Expert Evaluation • UK-NICE • Australia-PBAC • US-P&T Committee Reviews	■ Efficient and rational analysis ■ Optimizes at societal or "average patient" level	■ Typically an "all or nothing" outcome ■ May sub-optimize at individual level ■ Rarely make category substitution trade-offs
Pay-for-Performance/Guarantees • UK-NHS/Velcade • US-CMS/Repeat procedures • Miscellaneous others	■ Logical ■ Consistent with most other purchases	■ Requires "clean" endpoints ■ Cumbersome to manage drug-by-drug ■ Redemption is difficult

The U.S. lags most countries in implementing payer-centric models

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Paying for Value: Provider-Centric Models

Provider-Driven Models	Positives	Drawbacks
Prescribing Pattern Profiles • Educational, or • Tied to financial parameters	■ Peer comparisons drive behavior ■ Catches outliers	■ Blunt instrument ■ Case mix adjustment is imprecise
Academic or “Counter” Detailing	■ Fact-based, scientific dialog	■ Creates an “arms race” with Pharma ■ Are payers’ detailers a more “honest broker” than pharma’s?

Provider-based models are declining in prevalence in the U.S.

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Paying for Value: Patient-Centric Models

Patient-Driven Models	Positives	Drawbacks
Information Democracy • Enabled by Internet, and • Direct-to-Consumer messaging	■ Informed consumers create real markets ■ Self-interest is a proven motivator	■Mixed quality of information ■ Huge quantity of information
Cost-Sharing/Shifting to Patients • Benefits exclusions • Tiered co-payments • Medical Savings Accounts	■ Reduces issues of "agency" ■ Follows U.S. model in other areas (e.g retirement income)	■ Formulary tiers are cost-driven at present ■ Extreme cost-shifting undermines "insurance" ■ Many people will make poor choices

Patient-based models are strongly on the ascendancy in the U.S.

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Questions & Discussion

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