Transforming Big Pharma
Assessing the Strategic Alternatives

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Rutgers University
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John Ansell Consultancy

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TRANSFORMING BIG PHARMA
Assessing The Strategic Alternatives

I. How Pharma Differs from Other Industries

II. Pharma’s Strategic Options

III. Prospects for New Products
I. HOW PHARMA DIFFERS FROM OTHER INDUSTRIES
LONGEVITY

- Average time to peak sales for top 50 globally best-selling products

Source: John Ansell Consultancy
COST STRUCTURES: SMALL MOLECULES

1ry care/

Small molecule

- R & D 16.5%
- Cost of goods 13.2%
- Sales & marketing 35.0%
- General & administrative 8.0%
- Total 72.7%
- Margin 27.3%

Source: James, B, Big Pharma: The Beginning of the End or the End of the Beginning? p 10, Decision Resources, Inc. Spectrum, Pharmaceutical Industry Dynamics, May 2003/John Ansell Consultancy
## COST STRUCTURES: SMALL VS LARGE MOLECULES

<table>
<thead>
<tr>
<th></th>
<th>1ry care/ small molecule</th>
<th>Specialist/ large molecule</th>
</tr>
</thead>
<tbody>
<tr>
<td>R &amp; D</td>
<td>16.5%</td>
<td>similar</td>
</tr>
<tr>
<td>Cost of goods</td>
<td>13.2%</td>
<td>often greater</td>
</tr>
<tr>
<td>Sales &amp; marketing</td>
<td>35.0%</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>General &amp; administrative</td>
<td>8.0%</td>
<td>similar</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72.7%</strong></td>
<td>c.50%</td>
</tr>
<tr>
<td><strong>Margin</strong></td>
<td><strong>27.3%</strong></td>
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Source: James, B. Big Pharma: The Beginning of the End or the End of the Beginning? p 1
Decision Resources, Inc. Spectrum, Pharmaceutical Industry Dynamics, May 2003/John Ansell Consultancy
HOW CONCENTRATED IS THE PHARMA INDUSTRY?

Sales Taper for the Top 200 Globally Best-Selling Products 2011 ($ billion)

II. PHARMA’S STRATEGIC OPTIONS
MAJOR STRATEGIC OPTIONS FOR PHARMA

- Focussing down
- Diversification
- M&A
- Demergers
- More emphasis on emerging countries
- Develop new products
A CONUNDRUM

Focus

down or diversify?
DIVERSIFICACION

OTC

Generics

Pharmacy Benefit
Biosimilars
Management (PBMs)
MAJOR STRATEGIC OPTIONS FOR PHARMA

- Focussing down
- Diversification
- M&A
- Demergers
- More emphasis on emerging countries
- Develop new products
III. PROSPECTS FOR NEW PRODUCTS
III. PROSPECTS FOR NEW PRODUCTS

i. Trends in Numbers Launched

ii. Trends in Quality

iii. Trends in Attrition Rates

iv. Getting a True Fix on Sales Potential

v. Getting a True Fix on Profitability
i. Trends in New Product Quantity
GLOBAL FIRST LAUNCHES FOR NEW PRODUCTS 1970–2013

Source: John Ansell Consultancy.
GLOBAL FIRST LAUNCHES FOR NEW PRODUCTS 2000–2013

Source: John Ansell Consultancy.
GLOBAL FIRST LAUNCHES FOR NEW PRODUCTS 2007–2013

Source: John Ansell Consultancy.
ii.

New Product Quality:
Will tomorrow’s products be as good as today’s?
AIMING LOW WITH ME-TOO PRODUCTS
ME-TOO RESPIRATORY COMBINATIONS – DIMINISHING RETURNS

Sales in 2011 ($M.)

- No. 1 Seretide/Advair
- No. 2 Symbicort
- No. 3 Combivent
- No. 4 Foster
- No. 5 Dulera and No. 6 Flutiform – even less impact

Source: John Ansell Consultancy
BLOCKBUSTERS FIRST LAUNCHED IN ORPHAN INDICATIONS
iii.

What’s happening on Attrition in New Product Development?
CLASSICAL PORTRAYAL OF ATTRITION THROUGH R&D

Source: PhRMA, Biopharmaceuticals in Perspective Facts and Figures 2012 (Washington, DC: PhRMA, March 2012)
PERCENTAGE OF PROJECTS PROGRESSING:
PHASE I → MARKET (FDA)

1990 → 14%
2005 → 8%
PERCENTAGE OF PROJECTS PROGRESSING:
PHASE III → MARKET (FDA)

1990 → 80%
2005 → 50%
Merck to Withdraw Vioxx Because of Heart Risks

Painful Withdrawal for Makers of Vioxx
Pulling of Arthritis Drug Raises Questions on Marketing, Safety Risks
By Brooke A. Masters and Marc Kaufman
Washington Post Staff Writers

Vioxx maker knew of problems early

“Vioxx makers knew of drug's dangers three years before recall, says UW study”
Analysis

*Nature Reviews Drug Discovery* 10, 428–438 (June 2011) |
doi:10.1038/nrd3405

**The productivity crisis in pharmaceutical R&D**

Fabio Pammolli1,4, Laura Magazzini2,4 & Massimo Riccaboni3,4  
*About the authors*

Advances in the understanding of the molecular basis of diseases have expanded the number of plausible therapeutic targets for the development of innovative agents in recent decades. However, although investment in pharmaceutical research and development (R&D) has increased substantially in this time, the lack of a corresponding increase in the output in terms of new drugs being approved indicates that therapeutic innovation has become more challenging. Here, using a large database that contains information on R&D projects for more than 28,000 compounds investigated since 1990, we examine the decline of R&D productivity in pharmaceuticals in the past two decades and its determinants. We show that this decline is associated with an increasing concentration of R&D investments in areas in which the risk of failure is high, which correspond to unmet therapeutic needs and unexploited biological mechanisms. We also investigate the potential variations in productivity with regard to the regional location of companies and find that although
We show that this decline is associated with an increasing concentration of R&D investments in areas in which the risk of failure is high, which correspond to unmet therapeutic needs and unexploited biological mechanisms.
ENABLING TECHNOLOGIES:
FROM COMBINATORIAL CHEMISTRY
ENABLING TECHNOLOGIES: FROM HIGH THROUGHPUT SCREENING (HTS)
Products Originating From HTS

- Tarceva® erlotinib tablets
- PROMACTA
- Selzentry® (maraviroc) tablets
- IRESSA gefitinib
- Letairis® ambrisentan 5 mg and 10 mg Tablets
- Aptivus® (tipranavir)
- INTELENCE® (etravirine) 100 mg Tablets
- SPRYCEL® dasatinib 100 mg tablets
- Tykerb® (lapatinib)
- Nexavar® (sorafenib) tablets
- More Time for Living
- Samsca®
PROJECTIONS FROM NO. PROJECTS NOW IN DEVELOPMENT AT EACH PHASE

Source: Ansell, J., “Transforming Big Pharma”, Gower Publishing, based on Citeline/Pharmaprojects data
Global new products launches:
2012: 39  2013: 47
iv.
Getting a True Fix on New Product Sales Potential
UNDERFORECASTING SALES
Annual review edition headlines

1992 - annus horribilis

1993 - a year to retrench, restructure, rethink

1994 - an end or a beginning?

1999 Will R&D provide jam tomorrow?

2000 Exciting times or just an ongoing slog?

2002 Looking back at an uncertain future

2003 The old order comes to an end

2004 Misery loves company
"One of the Company’s most exciting new products is CLARITIN, approved in 17 overseas markets with U.S. approval expected soon. When fully established, the product is projected to generate sales of $200-to-$300 million annually."

- Schering Corporation (1989)

Peak sales: $3.159 billion
“Abilify has a solid shot at success, but our $1.4 billion projection by 2007 is insufficient to move Bristol-Myers Squibb’s underlying revenue growth in any given year beyond 2003” ICIS 2003

Reached sales of $4.991 billion by 2011
“we would expect Nexium to achieve rapidly (and within two years) a 20 per cent+ share of the Losec franchise with corresponding sales of more than $1 billion.”

Peak sales reached: $5.216 billion.
Could have sales of $1 billion “in four or five years’ time”
Scrip 1996

Peak sales of $5.026 billion in 2010!
“Analysts see huge potential for Advair/Seretide in the US, particularly in light of its successful start elsewhere ... By 2003, global sales predictions for the combination product are in the region of £1–1.5 billion.” Scrip 2001
Global Sales of Advair/Seretide and its Component Products

Source: John Ansell Consultancy based on ex-company sales
“Aricept could easily make sales in excess of $500 million a year” – A.G. Edwards, Pharma Letter, 1996

Sales peaked at $4.4 billion in 2009!
Annual sales could reach: ‘over $500 million within a few years’

Sales peaked at > $5 billion!
“Analysts feel that clopidogrel has the potential to become a blockbuster product, breaking the $500 million mark...”

The Pharma Letter (1998)

Sales peaked at $9.6 billion!
“first peak-sale estimates of $500 million were off by a factor of 25”
- Freda Lewis-Hall, Pfizer
Economist Pharma Summit, London (2011)
V.
Getting a True Fix on New Product Profitability
Returns on Research and Development for 1990s New Drug Introductions

Henry Grabowski, John Vernon and Joseph A. DiMasi

1 Department of Economics, Duke University, Durham, North Carolina, USA
2 Tufts Center for the Study of Drug Development, Tufts University, Boston, USA

Abstract

Background: Previously published research by the authors found that returns on research and development (R&D) for drugs introduced into the US market in the 1970s and 1980s were highly skewed and that the top decile of new drugs accounted for close to half the overall market value. In the 1990s, however, the R&D environment for new medicines underwent a number of changes including the following: the rapid growth of managed-care organisations; indications that R&D costs were rising at a rate faster than that of overall inflation; new market strategies of major firms aimed at simultaneous launches across world markets; and the increased attention focused on the pharmaceutical industry in the political arena.

Objective: The aim of this study was to examine the worldwide returns on R&D for drugs introduced into the US market in the first half of the 1990s, given that there have been significant changes to the R&D environment for new medicines over the past decade or so.

Results: Analysis of new drugs entering the market from 1990 to 1994 resulted in findings similar to those of the earlier research – pharmaceutical R&D is characterised by a highly skewed distribution of returns and a mean industry internal rate of return modestly in excess of the cost of capital.

Conclusions: Although the distribution of returns on R&D for new drugs continues to be highly skewed, the analysis reveals that a number of dynamic forces are currently at work in the industry. In particular, R&D costs as well as new drug introductions, sales and contribution margins increased significantly compared with their 1980s values.

Competition in the research-based pharmaceutical industry centres on the introduction of new drug therapies. In this paper, we examine the returns on research and development (R&D) for new drug entities introduced into the US market in the first half of the 1990s. This research work builds directly on earlier analyses of returns on R&D for the 1970s and 1980s introductions performed by Grabowski and Vernon.

Our prior analyses indicate that this industry has exhibited very skewed distributions of returns. In this regard, several significant new classes of drug therapies have been introduced since the late 1970s. Early movers in these classes have obtained the highest returns on R&D. We found that the top decile of new drugs accounted for close to half of the overall market value associated with all the new drug introductions in our 1970s and 1980s’ samples.
HOW NEW PRODUCTS FIRST LAUNCHED 2000–06 HAD PERFORMED BY 2013

Source: John Ansell Consultancy; based on ex-company sales.
HOW NEW PRODUCTS FIRST LAUNCHED 2000–06 HAD PERFORMED BY 2013

Source: John Ansell Consultancy
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Henry Grabowski,1 John Vernon1 and Joseph A. DiMasi2
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2002 assessment: only 30% of new products covered their costs
2010 reassessment: down to 20%

2014 survey: Of all new products first launched 2000–06 so far 21% have become BLOCKBUSTERS!
HOW NEW PRODUCTS FIRST LAUNCHED 2000-06 HAD PERFORMED BY 2013

- 59% Smaller products
- 21% Blockbusters
- 14% Half-blockbusters
- 6% Third-blockbusters

Source: John Ansell Consultancy
## Product sales

<table>
<thead>
<tr>
<th>Product</th>
<th>Sales (S'M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VYVANSE</td>
<td>1,227.8</td>
</tr>
<tr>
<td>ELAPRASE</td>
<td>545.6</td>
</tr>
<tr>
<td>LIALDA/MEZAVANT</td>
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<tr>
<td>VPRIV</td>
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</tr>
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<td>INTUNIV</td>
<td>334.9</td>
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<td>PENTASA</td>
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<td>FIRAZYR</td>
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<tr>
<td>FOSRENOL</td>
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</tr>
<tr>
<td>XAGRID</td>
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</tr>
<tr>
<td>Other product sales</td>
<td>136.1</td>
</tr>
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<td><strong>Total product sales</strong></td>
<td><strong>4,757.5</strong></td>
</tr>
</tbody>
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# Product Sales

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<th>Product</th>
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At very least, 35% of new products are profitable

> 40% are likely eventually to prove profitable.
LONGEVITY

- average time to peak sales for Top 50 globally best-selling products

Source: John Ansell Consultancy