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How the pharmaceutical business model has changed[1]

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The business model developed by the major pharmaceuticals after the Second World War is coming to the end of its life. This model is based on the development of "blockbusters": flagship products like Prozac® or Viagra® (produced and marketed by Lilly and Pfizer respectively), protected by patents and with global turnover of more than a billion dollars. In following this model, firms are supposed to fund the research and development of new drugs while at the same time making substantial profits.

To remain viable, the blockbuster model depends on four pillars:

- The protection of innovation by patents on drugs, enabling firms to benefit from a position of monopoly.
- Constant innovation, to regularly renew the stock of blockbusters that provide firms with their profits.
- Aggressive sales techniques to sell the maximum quantity of blockbuster drugs whilst they are protected by patent.
- A benevolent attitude on the part of the drug regulatory bodies.

The failure of just one of these pillars would undermine the whole industry. It is therefore understandable that to prevent any such failure, the pharmaceutical firms have long done everything in their power to secure this model. To this end, they have pursued several different strategies. The first concerns patents and their duration. The legislation on patents was strengthened by the international TRIPS agreement[2] of 1994, which extended the validity of national patents to an international level. As a result, the drug companies can now enforce their patents worldwide, preventing generic producers in developing countries from supplying their domestic markets. In addition to this strengthening of the legislation, American firms have succeeded in making the production and marketing of generics in the US conditional on a five-year extension of their patents (Hatch-Waxman Act, 1984). Lastly, in order to delay the entry of generics, they tend to increase the number of patents (the same drug is protected by a succession of patents registered at different times) and to initiate lawsuits to enforce their advantages.

In the second half of the 1980s and above all in the 1990s, the major pharmaceuticals lost the patents on many of their blockbusters. Loss in turnover was considerable,[3] prompting firms to acquire their competitors' blockbusters through mergers and acquisitions (M&A). For this reason, there was a proliferation of M&A in the 1990s and 2000s.

The end of the "Blockbusters" model

To maintain their sales volumes, aggressive sales strategies became commonplace. Instead of the traditional visits by medical reps and the massive financing of vocational training for doctors, which are being ever more tightly regulated, the pharmaceuticals are developing new forms of advertising and promotion, such as Direct to Consumer Advertising (DTCA) in the United States, or the distribution of drug prescription software to doctors and pharmacists.[4]

After going along with the blockbuster model, the regulatory bodies, subjected to strong budget constraints, encouraged the development of generic drugs. To this end, the authorities introduced various measures, such as facilitating drug approval procedures for generics (the ANDA process in the United States, the simplification of marketing approval applications in Europe), or introducing reference prices and incentives for doctors, pharmacists and patients to prescribe or consume generics.

[1] For a detailed analysis of changes in the pharmaceutical business model, see Abecassis P. and Coutinet N., "Médicaments génériques pivot de la reconstruction de l'industrie pharmaceutique", *Revue de la Régulation*, forthcoming.

[2] The TRIPS agreement (*Trade-Related Aspects of Intellectual Property Rights*) regulates intellectual property rights (copyrights, trademarks, patents, etc.) within the WTO.

[3] This is illustrated by the professional jargon: when blockbuster drug patents are about to expire, they are said to be "heading for the cliff". This term evokes the fall in turnover experienced when patents expire (as much as - 90 % in the space of a few months).

[4] See Abecassis P. and Coutinet N. (2009), "Le colloque singulier sur ordonnance des firmes pharmaceutiques", Journal d'Economie Médicale, vol 27, numéro 3, pp. 146-163.

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Forecasts 2010-2015 (average annual growth rate)

Countries	All drugs	Generics
North America	1%	11%
Europe	2%	9%
Japn	1%	6%
Rest of the world	15%	19%
France	-2% à -1%	9% à 12%
World	4%	12%

Source : IMS Health, 2012)

Despite the best efforts of the pharmaceutical companies, the model is in decline. The conditions for innovation and the creation of new products have become more difficult. To avoid more scandals like the one surrounding *Médiator*, the health authorities have tightened up the requirements for the granting of marketing approval; in the face of budget constraints, health insurance systems have forced down prices and cut their rates of reimbursement; the gamble of biotechnology and the necessary technological innovations have greatly increased R&D costs; despite the investments, R&D has long struggled to bring new products onto the market, particularly in the case of biotechnologies; generic and me-too drugs[5] are taking an ever larger share of the market, causing a steady fall in the price of patented drugs and undermining the monopoly positions of the major pharmaceuticals;[6] and lastly, during the Doha trade talks in 2001, the developing countries obtained the right to produce generic versions of drugs still protected by patents to fight pandemics like AIDS.

This ineluctable decline of the pharmaceutical industry's growth model explains both the weaker results of the global pharmaceutical sector and the large-scale restructuring of firms, as witnessed in France in the case of Sanofi-Aventis or Pfizer. It has also obliged the major pharmaceuticals to search for new profit strategies.

The rise of a generic model ...

As this growth model declines, it seems that it is being replaced by another, driven by the booming global market in generics. This market had a value of 134 billion dollars in 2011 and is expected to reach 231 billion dollars in 2017. The average annual growth rate of the world drugs market for the period 2010-2015 is forecast at about 4%, while that for generics is estimated to be 12% (but with large variations between countries: see table).

Apart from a higher sales growth rate than that of proprietary drugs, generic drugs also present several other advantages for firms. From an industrial point of view, their development entails relatively low R&D costs and their production can make use of excess production capacity. They therefore offer better profit prospects for investors. In terms of sales growth, they allow firms to penetrate new markets, especially in emerging countries - what are called "pharmerging markets". These markets have particularly high potential for growth. They accounted for 37% of the growth in the drugs market over the period 2006-2010, and this figure is forecast to rise to 63% for the period 2011-2014. In 2015, the market share of these countries is expected to equal that of the USA (about 30%, according to IMS). In parallel, in the developed countries, the increasing prescription and consumption of generics is driven by a reduction of 30 to 60% on the price of the proprietary drug.[7] Lastly, following a similar model to generics, spending on biosimilar medicines is also rising. According to IMS, it will reach 2 billion dollars in 2015, about 1% of total spending on biologics.

Many firms, in particular the major pharmaceuticals, have quickly succeeded in making this segment of the market profitable, thus offsetting some of their lost revenue in the proprietary drugs segment.[8] Today, most of them have adapted their production model to penetrate this market, either through mergers, acquisitions and alliances or by developing "autogenerics" (generics of their own patented products). Pfizer and Novartis provide an illustration of the different strategies pursued. Up until 2009, Pfizer had not wanted to develop subsidiaries producing generics, but from then on, their strategy changed. The firm created autogenerics for 7 of its active ingredients and bought the rights to 39 generics in the United States and 20 in Europe. Then in 2010, Pfizer launched a series of takeovers of generic producers, including Teuto Brasileiro and Ratiopharm. In 2012, it competed with Teva for acquisition of the Indian generic producer Micro

[5] Me-too drugs have the same therapeutic action as a patented drug but are sufficiently different not to be considered copies.

[6] On 21 June 2013, Pfizer lost the patent it had held since 1998 on Viagra®. On 22 June, fifteen firms, including Novartis, through its subsidiary Sandoz, and generic producers like Teva, had already obtained marketing approval and were ready to bring out their copies. Pfizer also has a generic of its proprietary drug, Sildenafil®, sold at a price of 28.50 euros for four tablets as compared with 78.50 euros for the proprietary drug.

[7] For an analysis of the evolution of world drug prices, see Hassett K. A. (2004), *Price control and the evolution of pharmaceutical markets*, American Enterprise Institute for Public Policy Research, 44 p.

[8] See Yacoub N. and Laperche B. (2010), "Stratégies des grandes firmes pharmaceutiques face aux médicaments génériques", *Innovations*, vol. 2, Number 32, pp. 81-107.

Labs. Pfizer's strategy, which it adapted relatively late, now appears to be twofold: to position itself on the generics market in developed countries and to penetrate the markets in emerging countries.

Unlike Pfizer, Novartis chose to enter this market early, with the creation of its subsidiary generics producer Sandoz in 1996. From 2000, Sandoz specialised completely on this segment of the market, using the "umbrella" trade name Sandoz for all its generics. In 2004, the group started buying up its competitors and became the leader generics producer on the US and German markets. Generics now account for 20% of the group's sales. In 2006, Sandoz created the first bio-similar medications.

…Which seems out of steam

The model developed by the regulatory bodies to satisfy their budget constraints and by the major pharmaceuticals to protect their profits is only transitory, because it does not address the shortcomings of the blockbuster model. This latter was costly because of the monopoly enjoyed by firms through their patents. Without any quid pro quo or control, patents represent a "blank cheque" for the industry, which has gradually increased its spending on promotion to such an extent that it now exceeds R&D spending. The blockbuster model has also proved to be inefficient, since it can no longer either maintain a sufficient level of growth for its own survival or, more seriously, satisfy the need for new drugs for certain illnesses.

The "new" model centred on generics is not a viable solution. The health authorities have contented themselves with reducing the cost of drugs by exerting pressure on the prices and making decisions that favour the use of generics. Although both of these measures succeed in their objective of reducing costs over the short term, the danger is that they will precipitate the fall of the blockbuster model by inducing firms to turn away from R&D, without proposing any real alternative model. Conscious of this problem, the regulatory bodies seem to be opting now for a policy of encouraging innovation to improve the quality of treatment. For the major pharmaceuticals, the generic model, with its profitability, can only be a transitory solution. In 2012, the sharp rise in the number of marketing approvals given largely for new biologic suggests that we may be returning to a blockbuster model focused on biotech medications targeting only the receptive patients among those presenting the same clinical signs.

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24 mars 2014 – 12:45 -14:00 – ENS-Cachan- Pollack room, Build. Laplace.

ACIDES Seminar (Approches Critiques et Interdisciplinaires des Dynamiques de l'Enseignement Supérieur)

CEPN-EMOI & IDHE

AURÉLIEN CASTA (IDHE – UNIV. PARIS OUEST & UNIVERSITÉ D'AMIENS) : *« la rémunération étudiante (1950) : retour une proposition à la croisée des solidarités salariales et de la démocratisation scolaire »*

28 mars 2014 – 14:00-16:00 - Université Paris 13, campus of Villetaneuse -Room K301

CEPN Seminar

JOËL RUET (UNIVERSITÉ PARIS 13, CEPN) : *« Figure du capitalisme d'émergence industrielle »*

4 avril 2014 – 14:00 -16:00 – ENS Cachan

CEPN-DEFI-MIAP & IDHE Seminar

JAN TOPOROWSKI (SOAS, LONDRES, ROYAUME-UNI)

11 Avril 2014 – 14:00-16:00 – Université Paris 13, site de Villetaneuse -Salle K301

CEPN Seminar

PAUL MALLIET (OFCE) : « *Évaluation Macroéconomique de scénario de transition énergétique à l'aide du modèle Three-ME »*

17 avril 2014 – 12:00-14:00 - Université Paris 13, campus of Villetaneuse

CEPN-MIAP Seminar

RODERICK O'DONNELL (UNIVERSITY OF TECHNOLOGY. SYDNEY. AUSTRALIE) : *« IYLM : A General Theory-compatible "ISLM" model »*

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