AN EXAMINATION OF THE PROPOSED TEVA-ALLERGAN MERGER

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I. INTRODUCTION

The proposed merger joins the largest generic pharmaceutical company in the world, Teva Pharmaceuticals, with Allergan, an important rival that is currently the third largest in world-wide generic sales. In this comment, we evaluate the competitive effects of the merger and its implications for consumer welfare in the United States[3]. These effects could be large since generic sellers introduce a critical measure of competition into pharmaceutical markets and play an important competitive role in making prescription drugs affordable. Limiting the competitive discipline introduced by generic sellers could therefore have substantial adverse consequences.

Both of the merging parties are the product of previous mergers. Teva's past includes mergers with Copley Pharmaceuticals (August 1999), Novophram (February 2000), SICOR, Inc. (January 2004), IVAX Pharmaceuticals (July 2005), Barr Pharmaceuticals (December 2008), and Cephalon Inc. (October 2014). These mergers contributed to elevating Teva to its current leading position in the generic pharmaceutical industry.

In contrast, Allergan was largely a branded pharmaceutical company before its merger with Actavis in 2015. However, Actavis' position as a generic drug supplier was also enhanced by earlier mergers. These include Watson Pharmaceuticals (October 2012), Warner Chilcott (October 2013), Forest Labs (July 2014), and Furiex Pharmaceuticals (July 2014).

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The position of the merging companies is evident in the table below, which shows world-wide generic market shares for the ten leading companies in 2014:

Global Market Share for the 10 Leading Generic Pharmaceutical Companies (2014)

Firm	Market Share (%)
Teva	12.2%
Novartis (Sandoz)	11.5%
Actavis (Allergan)	8.9%
Mylan	8.8%
Sun Pharmaceuticals	6.0%
Aspen Pharmacare	4.1%
Hospira	3.6%
Sanofi	3.2%
Fresenius	3.1%
Lupin	2.7%
Top 10 firms	64.6%

As indicated by these data, upon completion of the proposed merger, the merged firm will control over 21 percent of the world-wide generic business. At the same time, the industry as a whole is relatively un-concentrated and includes a number of important firms.

For sales within the United States, the Food and Drug Administration ("FDA") received in 2014[4] a total of 1,473 Abbreviated New Drug Applications ("ANDAs") requesting the required authorization to produce and sell generic pharmaceuticals. Of these applications, Teva submitted 106 and Actavis (Allergen) submitted 214[5]. Together, the two companies accounted for 22 percent of all ANDAs filed. United States shares are thereby not much different from those reported on a worldwide basis.

II. COMPETITION IN GENERIC PHARMACEUTICAL MARKETS

Following the passage of the Hatch-Waxman Act in 1984, a new industry evolved which became separate and distinct from the branded pharmaceutical industry. It arose specifically from revised FDA regulatory requirements. Rather than requiring a New Drug Application ("NDA"), in which safety and efficacy would need to be demonstrated, merely an ANDA was now required where the essential requirement would be to demonstrate that the generic firm's product was "bioequivalent" to an established one. Critically, this abbreviated task was much less costly than that imposed by an NDA, with the cost falling to under $1 million by the early 1990s[6].

Under the new regulations, generic suppliers entered many pharmaceutical markets and prices declined sharply. For example, with only a single generic entrant, the average generic price would be roughly 60 percent of the branded price[7]. However, additional entrants would often appear, and prices would decline

[4] *Top 10 Generic Drug Manufacturers Worldwide Based on Market Share in 2014*, Statista, www.statista.com/statistics/314595/ (last visited Jan. 28, 2016).

[5] Food & Drug Admin., Activities Report of the Generic Drug Program (FY 2014), FDA.gov, http://www.fda.gov/Drugs/DevelopmentApprovalProcess/HowDrugsareDevelopedandApproved/ApprovalApplications/AbbreviatedNewDrugApplicationANDAGenerics/ucm427830.htm (last updated Dec. 23, 2014).

[6] David Reiffen & Michael R. Ward, *Generic Drug Industry Dynamics*, 87 Rev. Econ. & Stat. 37, 38 (2005).

[7] This finding applies to the years between 1976 and 1987. *See* Richard E. Caves et al., *Patent Expiration, Entry, and Competition in the U.S. Pharmaceutical Industry*, 1991 Brookings Papers on Econ. Activity. Microeconomics 1, 35.

further. Although branded prices were largely set by demand-side factors, primarily the therapeutic value of the product[8], generic prices for most drugs were determined by supply-side factors. Production costs were particularly important, although it is estimated that it required eight or more rivals to drive prices down to production costs[9].

Not only did the number of generic rivals selling the same molecule affect price levels but also it impacted rates of price increase. In a still unpublished study, Dave and Hartzema examine commercial claims data from January 2008 to June 2013 to identify a sample of 1,120 pharmaceutical agents available as generic drugs during the entire 5½-year period[10]. Dividing their sample into four nearly equal sized groups based on HHI values[11], calculated in terms of the relative numbers of prescriptions dispensed of a drug, they report substantially higher average price increases where seller concentration was higher and fewer firms were present.

As compared with generally stable prices for generic products in the least concentrated quadrant, Davis and Hartzema report an average increase of 60 percent in the highest group over the 5½-year study period, and smaller price increases in the two intermediate groups[12]. Strikingly, for fully half of the drugs included in their sample, the associated initial HHI values exceeded 5000, which can be reached when there are two equal sized sellers–a virtual duopoly.

Dave and Hartzema point out that supply limitations (i.e. drug shortages) do not account for their findings. On testing whether the higher prices associated with fewer rivals could have resulted from supply limitations, they find that generic products with smaller numbers of sellers had fewer rather than more periods of drug shortages[13]. With smaller numbers of firms selling a molecule and the resulting higher prices, the opportunity costs of not filling orders are increased, and fewer such periods were present. Although higher prices often follow from restricted supply conditions, that factor does not confound the authors' finding that the presence of fewer sellers was associated with increasing generic prices.

A contributing factor to the lack of sufficient rivals for many pharmaceutical products, and thereby increased prices, is the presence of regulatory lag. According to the president of the Generic Pharmaceutical Association, the median FDA review time for ANDA approval in 2011 was 31 months. This lag was 31 months in 2012, and increased to 36 months in 2013 and an estimated 42 months in 2014[14]. He also stated "At the industry's best estimate, current fiscal year median approval times [for 2015] will be 48 months–the slowest it has ever been[15]." This factor contributed to the presence of fewer rivals available to compete for sales of drugs whose patents could no longer block entry.

III. DIRECT EFFECTS OF THE PROPOSED MERGER

In many cases, competitive effects pertain to individual pharmaceutical molecules. Even though there may be available alternatives, molecular entities often have different therapeutic effects on different patients[16], so for some patients, there is little therapeutic overlap. For others, however, relevant markets are broader and

[8] Z. John Lu & William S. Comanor, *Strategic Pricing of New Pharmaceuticals*, 80 Rev. Econ. & Stat. 108 (1998).

[9] Reiffen & Ward, *supra* note 6, at 37–49.

[10] C.V. Dave & A.G. Hartzema, Prices and Generic Medications, and its Association with Industry Consolidation, Presentation at the International Conference on Pharmacoepidemiology & Therapeutic Risk Management (Aug. 22–26, 2015).

[11] HHI values are a standard measure of seller concentration. They are obtained by summing the squared market shares of all sellers in the relevant market. For example, with two sellers in a market, each with a 50% market share, the HHI equals (50x50) x 2 = 5000.

[12] *Supra* note 10 at tbl.1.

[13] *Id*. at 9.

[14] Ralph G. Neas, President, Generic Pharm. Ass'n, Statement at the FDA Public Meeting on GDUFA (June 15, 2015), at http://www.gphaonline.org/gpha-media/press/statement-by-ralph-g-neas-president-and-ceo-gpha-on-the-june-15th-fda-public-meeting-on-gdufa

[15] *Id*.

[16] Qiang Ma & Anthony Y. H. Lu, *Pharmacogenetics, Pharmacogenomics, and Individualized Medicine*, 63 Pharmacological Rev. 437 (2001).

can include more than a single molecule. For this reason, we examine the direct competitive effects of the proposed merger in terms of both particular molecules and limited therapeutic markets.

On both accounts, the proposed merger threatens to increase market concentration. Based on data from 2006 to the present, there were 67 direct molecule overlaps between Teva and Allergan (Actavis) in that both parties sold the same generic drugs[17]. Turning to more broadly stated therapeutic areas, and employing the therapeutic area definitions contained in the Physician's Desk Reference ("PDR"), we find there were 59 direct therapeutic overlaps between the two companies[18]. Lists of both overlapping molecules and therapeutic areas are contained in the Appendices.

IV. INDUSTRY-WIDE COMPETITIVE EFFECTS

Under the Hatch-Waxman regulatory structure, competitive effects are broader than represented by data on product overlaps. Equally important are conditions within which early generic entry can and will occur. We therefore consider such conditions as well.

A significant element of this regulatory structure is the "Paragraph IV" route, as specified by the Hatch-Waxman Act[19]. On filing an ANDA, generic entrants can wait until existing patents, if any, on the drug have expired. Or alternatively, generic entrants can take the Paragraph IV route to gain quicker FDA approval and entry. However, a Paragraph IV filing "automatically counts as patent infringement[20]" to which the branded company holding the patent can respond with an infringement suit. If the patent holder does not bring an action within forty-five days, the ANDA is accepted and the generic entrant can proceed. However, if a suit is brought, the FDA must withhold approving the ANDA for a period of up to 30 months, or until questions of patent validity or infringement are resolved.

Although generic entry is then postponed while litigation proceeds, the Hatch-Waxman Act provides a special incentive for generic manufacturers to follow this route and challenge questionable patents. If successful, a first-to-file prospective entrant taking the Paragraph IV route is granted a six-month period of exclusivity during which the FDA will approve no additional ANDA. As Justice Breyer observed "[i]f the first-to-file generic manufacturer can overcome any patent obstacle and bring the generic to market, the 180-day period of exclusivity can prove valuable, possibly 'worth several hundred million dollars.[21]"

What this regulatory provision emphasizes is the importance of potential competition in this regulatory structure. For any particular molecular agent, competition begins with the first entrant, who can potentially lead a parade of followers. However, the regulatory framers were concerned that generic entry could be blocked by the presence of weak patents on the existing branded products and sought to encourage legal challenges. The statute thus sought to encourage generic entry by offering the Paragraph IV route to generic entry and rewarding successful challenges in the form of a six-month period of generic exclusivity[22].

In this structure, the first company to file an ANDA plays a significant role, and particularly those who take the Paragraph IV route. To be sure, not all first entrants pursue this route but those that do have important

[17] These data include products originally sold by companies acquired by Teva or Allergan so that the Teva data includes those drugs sold earlier by Barr and Ivax Corp. and the Allergan/Actavis data include products sold earlier by Watson Pharmaceuticals, Warner Chilcott, Forest Labs and Furiex.

[18] This figure indicates the number of therapeutic areas as defined in the PDR that include generic drugs sold by both merging parties. In some cases, they include products containing the same API, while in others, APIs are different but have similar therapeutic indications.

[19] Fed. Trade Comm'n, *Generic Drug Entry Prior to Patent Expiration: An FTC Study* 1–10 (July 2002), *available at* https://www.ftc.gov/sites/default/files/documents/reports/generic-drug-entry-prior-patent-expiration-ftc-study/genericdrugstudy_0.pdf

[20] *FTC v. Actavis, Inc.*, 133 S. Ct. 2223, 2235 (2013) (internal quotation marks omitted).

[21] *Id.* at 2229 (citation omitted).

[22] The FTC Report, supra, emphasized this objective: "The 180-day marketing exclusivity provision was intended to increase the economic incentives for a generic company to be the first to file an ANDA containing a Paragraph IV certification and get to market." Fed. Trade Comm'n, *supra* note 19, at vi.

competitive implications[23]. Under the current regulatory regime, it is essential that there remain large generic companies who can both pay high litigation costs and assume the associated risks.

V. PROSPECTIVE EFFECTS OF THE PROPOSED MERGER ON PARAGRAPH IV ENTRY

Teva and Allergan (Actavis) are both frequent participants in the Paragraph IV process, as indicated by the available data included in the appendix on first-mover ANDA applications since 2006. These data include applications containing Paragraph IV certifications. Between 2006 and the present, Teva, including the firms it had acquired, had first ANDA status for 131 drugs – the largest number of any generic company. There were also 67 first filings by Actavis, which included those by its acquisition of Watson Laboratories. Only Mylan Pharmaceuticals had more first filings than Actavis at 87[24]. Removing the independent decision-making of one of the merging parties would therefore likely eliminate a significant source of Paragraph IV filings and therefore competitive challenges.

This presents a unique problem of market definition: it relates to the willingness of firms to challenge patented drugs whose protection is either dubious or drawing to an end. Unlike cases of product overlap, it is more difficult to identify those firms in advance, but we can still observe the set of firms from which they are drawn. From this limited set, the proposed merger eliminates an important member. To be sure, this consideration can be recast into terms of most likely potential entrants seeking to enter more narrowly defined markets. Earlier antirust actions did just that.

VI. ANTITRUST PRECEDENTS

Consider the Falstaff-Naragansett beer merger case of 1974[25]. In that decision, the Supreme Court held:

The District Court should therefore have appraised the economic facts about Falstaff and the New England market in order to determine whether in a realistic sense Falstaff could be said to be a potential competitor…so positioned on the edge of the market that it exerted beneficial influence on competitive conditions in that market[26].

In Falstaff, that beneficial influence was that if the incumbent firms raised their prices too much, Falstaff would enter and drive prices down. In regard to generic drugs, the relevant market is not the sale of beer in a geographic area but instead the set of drug products whose patents are questionable or drawing to an end so that more rapid generic entry would lead to lower consumer prices and enhanced consumer welfare.

A more recent case concerns one of the merging parties here. In its 2013 Actavis decision the Court ruled that a principal infirmity of "a reverse payment settlement with the first filer…'removes from consideration the most motivated challenger, and the one closest to introducing competition[27].'" In this passage, Justice Breyer identifies the first mover generic company as the one most likely to introduce competition into the relevant market. That factor is equally relevant for the merger at issue here.

VII. A CAUTIONARY CONCLUSION

A common response to the presence of product overlaps between merging parties is to require product divestitures in the belief that competitive issues could be resolved. However, that solution is not sufficient in

[23] Between 1998 and 2000, approximately 20 percent of all generic applications sought entry prior to patent expiration. *Id.* at ii. Of course, this percentage understates the percentage of first-movers pursing this objective.
[24] Food & Drug Admin., *supra* note 5.
[25] *United States v. Falstaff Brewing Corp.*, 410 U.S. 526 (1973).
[26] Id. at 533.
[27] *FTC v. Actavis, Inc.*, 133 S. Ct. 2223, 2235 (2013) (internal quotation marks omitted).

this case. In the generic drug industry, brands and patents are not present and thus cannot be exchanged. All that can really be divested is the relevant ANDA. But that value is fleeting, and it is unlikely that potential buyers would pay much for the right to be a late mover into a generic market where prices decline with each additional entrant.

As Caves, Whinston and Hurwitz emphasized in an earlier study, "generic drug companies make money by being the first to enter after patent expiration[28]." What is lost in a possible divestiture is the earlier entrant with a presumably stronger market position; while what is gained is a later entrant in a far weaker market position. What a recipient gains may not therefore be worth much. In such circumstances, a divestiture remedy for the competitive issues raised by this merger is not likely an effective option.

Appendix A
First Filings and ANDAs Since January 1, 2006

Rank	Company	First-Filed ANDAs	Total ANDAs
1	Teva Pharmaceutical Industries	131	439
2	Mylan	87	703
3	Allergan (Actavis)	67	368
4	Apotex, Inc.	43	329
5	Roxane Laboratories, Inc.	43	123
6	Dr. Reddy's Laboratories	42	260
7	Novartis (Sandoz)	41	273
8	Sun Pharmaceutical Industries, Inc.	30	433
9	Par Pharmaceutical	27	115
10	Lupin Pharmaceuticals Ltd.	24	241
11	Perrigo Company	24	33
12	Aurobindo Pharma Ltd.	22	424
13	Glenmark Pharmaceuticals Ltd.	20	169
14	Torrent Pharma, Inc.	15	151
15	Hospira	14	110
16	Ranbaxy	14	0
17	Pharmaforce Inc.	13	3
18	Akorn	11	55
19	Anchen Pharmaceuticals, Inc.	11	53
20	Zydus Pharmaceuticals (USA), Inc.	9	198
21	Impax Laboratories, Inc.	9	80
22	Novel Laboratories, Inc.	9	51
23	Bedford Laboratories	9	22
24	Amneal Pharma.	7	150
25	Paddock Laboratories, Inc.	7	35
26	Tolmar, Inc.	7	14

[28] Caves et al., *supra* note 7, at 37.

Sources:

Food & Drug Admin., *Approved Drug Products with Therapeutic Equivalence Evaluations* (35th ed. 2015), *available at* http://www.fda.gov/downloads/Drugs/DevelopmentApprovalProcess/UCM071436.pdf *ANDA(Generic) Drug Approvals*, Food & Drug Admin http://www.fda.gov/Drugs/DevelopmentApprovalProcess/HowDrugsareDevelopedandApproved/DrugandBiologicApprovalReports/ANDAGenericDrugApprovals/ (last visited Jan. 26, 2016).

Notes:

[1] Companies are ranked by the number of first filings. Only companies with seven or more first filings are included in this chart. There are 129 additional companies with six or fewer first filings. The complete list is on file with AAI.

[2] ANDAs and first filings made by Actavis or Watson Pharmaceuticals are attributed to Allergan due to Allergan's recent merger activity. Similarly, because Teva acquired IVAX Pharmaceuticals in 2005 and Barr Pharmaceuticals in 2008, their ANDAs and first filings are attributed to Teva in this table. There may be additional merger activity not accounted for in this data.

Appendix B
Molecule Overlaps Between Teva and Allergan

ACITRETIN
ALBUTEROL SULFATE
ALBUTEROL SULFATE; IPRATROPIUM BROMIDE
ALENDRONATE SODIUM
AMLODIPINE BESYLATE
AMLODIPINE BESYLATE; BENAZEPRIL HYDROCHLORIDE
AMPHETAMINE ASPARTATE; AMPHETAMINE SULFATE; DEXTROAMPHETAMINE SACCHARATE; DEXTROAMPHETAMINE SULFATE
BICALUTAMIDE
BUDESONIDE
BUPRENORPHINE HYDROCHLORIDE
BUPRENORPHINE HYDROCHLORIDE; NALOXONE HYDROCHLORIDE
CABERGOLINE
CELECOXIB
CLONIDINE
CLOPIDOGREL BISULFATE
CLOZAPINE
DEXMETHYLPHENIDATE HYDROCHLORIDE
DIVALPROEX SODIUM
DOCETAXEL
DONEPEZIL HYDROCHLORIDE
DORZOLAMIDE HYDROCHLORIDE
DORZOLAMIDE HYDROCHLORIDE; TIMOLOL MALEATE

DROSPIRENONE; ETHINYL ESTRADIOL
DULOXETINE HYDROCHLORIDE
DUTASTERIDE
EPIRUBICIN HYDROCHLORIDE
ETHINYL ESTRADIOL; LEVONORGESTREL
ETHINYL ESTRADIOL; NORETHINDRONE
ETHINYL ESTRADIOL; NORETHINDRONE ACETATE
FINASTERIDE
GALANTAMINE HYDROBROMIDE
GEMCITABINE HYDROCHLORIDE
GRISEOFULVIN, MICROSIZE
GUANFACINE HYDROCHLORIDE
HYDROCHLOROTHIAZIDE; IRBESARTAN
IBUPROFEN; OXYCODONE HYDROCHLORIDE
IRBESARTAN

Appendix B (cont.)
Molecule Overlaps Between Teva and Allergan

IRINOTECAN HYDROCHLORIDE
LAMOTRIGINE
LEVALBUTEROL HYDROCHLORIDE
LEVETIRACETAM
LEVOFLOXACIN
LEVONORGESTREL
METHYLPHENIDATE HYDROCHLORIDE
METRONIDAZOLE
MORPHINE SULFATE
MOXIFLOXACIN HYDROCHLORIDE
OXALIPLATIN
OXYMORPHONE HYDROCHLORIDE
PANTOPRAZOLE SODIUM
PIOGLITAZONE HYDROCHLORIDE
PRAMIPEXOLE DIHYDROCHLORIDE
PRAVASTATIN SODIUM
QUETIAPINE FUMARATE
RALOXIFENE HYDROCHLORIDE
RAMELTEON
RISPERIDONE
SILDENAFIL CITRATE
SIMVASTATIN
SUMATRIPTAN SUCCINATE
TOPIRAMATE
TOPOTECAN HYDROCHLORIDE
TRANDOLAPRIL

TRETINOIN
VALACYCLOVIR HYDROCHLORIDE
VANCOMYCIN HYDROCHLORIDE
ZOLPIDEM TARTRATE

Source:

Food & Drug Admin., *Approved Drug Products with Therapeutic Equivalence Evaluations* (35th ed. 2015), *available at* http://www.fda.gov/downloads/Drugs/DevelopmentApprovalProcess/UCM071436.pdf