Discussion of

"Institutional cross-holdings and generic entry in the pharmaceutical industry"

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by

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The premise

- *Modern corporations generally have many shareholders with potentially different interests.*

- *Determining a firm's objective thus constitutes a **social choice** problem.*

- *Nevertheless, much of finance and industrial organization theory assumes that firms simply maximize their **own value**, irrespective of their shareholders' potentially **heterogeneous** interests.*

➢ ***Shareholder diversification** can lead to firms internalizing the externalities they impose on other firms.*

A quick summary

- *Using 1,339 challenges over the period 2003-2016, the authors show that institutional cross-holdings,*
  - *are positively associated with the likelihood that brand and generic producers will enter into a settlement agreement in which the brand often pays the generic to stay out of the market.*
  - *are positively associated with the brand's daily abnormal returns around the settlement agreement.*
  - *are positively associated with the delay in the sale of generic by their producers who settle with the brand pharma.*
    - *These delays preclude other generic producers from entering the market.*

➢ *Institutional cross-holdings facilitate collusion between brand and generic producers in the U.S. pharmaceutical industry.*

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Overall assessment

- *Novel setting to answer an important question:*
    - *Do institutional cross-holdings affect corporate behavior?*

- *A big data endeavor!*

- *Contributes to the growing literature on the prevalence of institutional cross-holdings and their implications for product market competition and consumer welfare.*

- *It was a true pleasure reading the paper and I highly recommend it.*

The roadmap of my discussion

- *The sample to study institutional cross-holdings.*
- *The measurement of institutional cross-holdings.*
- *The heterogeneity among institutional investors.*
  - *Their incentives/ability to influence.*
- *The heterogeneity among sample firms.*
- *Identification.*

The sample

Panel B: Distribution by listing status	N	Percentage
Generic public & brand public	293	21.9%
Generic public & brand private	252	18.8%
Generic private & brand public	310	23.2%
Generic private & brand private	484	36.1%
Total	1,339	100.0%

- *About one fifth of the 1,339 challenges involves public generic and public brand producers where the key variable of interest – institutional cross-holdings are properly defined.*

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The measurement

$$\Delta W = (\alpha_b + \alpha_g)\left(\frac{\alpha_b}{\alpha_b + \alpha_g}\Delta Brand\ Value + \frac{\alpha_g}{\alpha_b + \alpha_g}\Delta Generic\ Value\right), \quad (1)$$

where $\alpha_b = \sum_{k=1}^{n} \alpha_b^k$ and $\alpha_g = \sum_{k=1}^{n} \alpha_g^k$ are top generic shareholders' percentages of ownership in the brand and generic companies. $1 \leq k \leq n$ denotes the kth largest generic shareholder. α_b^k is the kth largest generic shareholder's ownership in the brand company. α_g^k is the kth largest generic shareholder's ownership in the generic company. $\boxed{\frac{\alpha_b}{\alpha_b+\alpha_g}}$ in equation (1) is the measure of institutional cross-holdings. To have generic shareholders to act

- *Each shareholder maximizes its weighted average holdings in the brand and generic producers.*
- *Aggregating among top generic shareholders' holdings in both firms as done in this paper assuming perfect coalition among very different shareholders (Harford, Jenter and Li 2011).*
  - *Table 11 in the paper however, suggests "there are conflicts of interest among generic institutional shareholders with differential number of shares in the brand incumbent."*
  - *Your measure overlooks the difference in mcap of each firm – BMS is at least six times of Mylan.*

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The measurement

First quarter of 2013
Generic firm: Mylan
Brand firm: Bristol-Myers Squibb

	Generic shares	Brand shares
Vanguard	7.04%	4.61%
Paulson & Co. Inc.	4.72%	0.00%
BlackRock	5.03%	4.50%
State Street	4.35%	4.06%
Bank of America	3.91%	1.09%
Goldman Sachs	2.72%	0.46%
Fidelity	0.89%	0.40%
Wellington Management	3.67%	2.46%
Jennison Associates	1.15%	0.94%
Mellon Bank	1.79%	1.55%

- *Among the top 10 IIs of Mylan (generic producer), the second largest II has no holdings in BMS (brand producer).*
  - *Would Paulson & Co. have the same incentives as Vanguard (the largest) and Blackrock (the third largest) in influencing product market conduct of the two drug companies?*

Shareholder heterogeneity

- *By the paper's construction, some of the shareholders in the cross-holding measurement are themselves not cross-holders (e.g., Poulson & Co.).*
- *Shareholders differ by their investment horizons and portfolio holdings.* *(Chen, Harford, and Li 2007)*
- *Cross-holders of Mylan and BMS might also hold shares in other generic and brand firms that might interfere the paper's findings especially if those generic firms might be involved in the same challenge and/or those brand firms might be marketing competing brand drugs.*

Shareholder heterogeneity

- *Shareholders exhibit different holding horizons:*

Mylan top 10 holders	Mylan since	BMS since
VANGUARD GROUP, INC.	2009	1997
BLACKROCK INC	2007	2000
PAULSON & CO. INC.	2010	-
STATE STR CORPORATION	2007	2000
BANK OF AMERICA CORPORATION	2007	1999
WELLINGTON MANAGEMENT CO, LLP	2007	1996
GOLDMAN SACHS & COMPANY	2007	2000
JANUS CAPITAL MANAGEMENT LLC	2008	2002
HARRIS FINANCIAL CORP	2011	2011
MELLON BANK NA	2007	2000
NORDEA INVT MGMT (DENMARK)	2007	2002

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Shareholder heterogeneity

- *Shareholders have very different portfolios in the pharma industry: a bundle of generic and brand firms.*

	Pharmaceuticals Firms		Pharmaceuticals Firms		Pharmaceuticals Firms
VANGUARD GROUP, INC.	ABBOTT LABORATORIES	**BLACKROCK INC**	3SBIO INC	**PAULSON & CO. INC.**	MEAD JOHNSON NUTRITION CO
102	ABBVIE INC	108	ABBOTT LABORATORIES	2	MYLAN INC
	ACACIA RESEARCH CORP		ABBVIE INC		
	ACADIA PHARMACEUTICALS INC		ACACIA RESEARCH CORP		
	ACHILLION PHARMACEUTICALS IN		ACADIA PHARMACEUTICALS INC		
	ACTAVIS INC		ACHILLION PHARMACEUTICALS IN		
	ACURA PHARMACEUTICALS INC		ACTAVIS INC		
	AFFYMAX INC		ACURA PHARMACEUTICALS INC		
	AKORN INC		AETERNA ZENTARIS INC		
	ALEXZA PHARMACEUTICALS INC		AFFYMAX INC		
	ALLERGAN INC		AKORN INC		
	ALNYLAM PHARMACEUTICALS INC		ALLERGAN INC		
	AMAG PHARMACEUTICALS INC		ALNYLAM PHARMACEUTICALS INC		
	AMICUS THERAPEUTICS INC		AMAG PHARMACEUTICALS INC		
	APRICUS BIOSCIENCES INC		AMARIN CORPORATION PLC		
	ATHERSYS INC		AMICUS THERAPEUTICS INC		
	AUXILIUM PHARMACEUTICALS INC		APRICUS BIOSCIENCES INC		
	AVANIR PHARMACEUTICALS INC		ASTRAZENECA PLC		
	BIODEL INC		ATHERSYS INC		
	BIODELIVERY SCIENCES INTERNA		AUXILIUM PHARMACEUTICALS INC		

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Firm heterogeneity

- *Ownership structure whereby more concentrated holdings by other shareholders (individuals or other organizations) might prevent cross-holders from being influential.*
  - *Amazon, Facebook, Google, Walmart, …*

- *The economic significance of the brand drug in question among the brand firm's portfolio of drugs might also vary on a case by case basis.*

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Firm heterogeneity

- *It is not clear cross-holders will be influential in the following pair.*
  - *Holdings in each portfolio firm are small; while cross-holding based on the authors' measure is large.*

Second Quarter of 2008	**Market Cap as of end of Q2 2008(in 000's)**		
Generic firm: Impax	$ 672,578		
Brand firm: Endo	$ 4,585,827		
	Impax	**since**	**Endo**
DIMENSIONAL FUND ADVISORS, LP	0.55%	Q3 2007	0.13%
MARSHALL WACE NORTH AMER, L.P.	0.15%	Q2 2008	0.00%
NORTHERN TRUST COMPANY OF CT	0.14%	2000	0.02%
PUBLIC EMP' RETIREMENT ASSN CO	0.06%	2004	0.30%
RIVERSOURCE INVESTMENTS, LLC	0.02%	Q2 2007	0.13%
Cross-holding	38.46%		

Firm heterogeneity

- *It is not clear cross-holders will be influential in the following pair.*
  - *Highly concentrated ownership in both firms!*

Impax	
From 2009 proxy statement (first year that filed proxy)	
All directors and executive officers as a group (11)	5.50%
Pamela Hsiao (family trust)	6.50%
Jacob Gottlieb	9.10%
Pequot Capital Management Inc	8.90%
Wellington Management Company LLP	13.10%
Total	**43.10%**
Endo	
From 2008 proxy statement	
All directors and executive officers	1.70%
D.E. Shaw Co., LP et al	10.80%
Capital Research and Management Co	10.10%
Barclays Global Investors et al	7.90%
Royce & Associates LLC	5.40%
Total	**35.90%**

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Identification

- *Quasi-indexers are identified based on IIs' trading behavior in the past (Bushee 2001), they are not index funds that we talk about these days.*

- *The discussion of addition/deletion to index potentially driven by firm performance (outcome of lawsuit) is out of place.*

- *Brand Scandal % is taken in 3Q 2003, while not all funds are known to be implicated at the time.*
- *If the mutual fund trading scandal leads to exodus of mutual fund investors, what is the implication for the holdings of those "scandal" funds?*

I am surprised by the positive loading on the IV (an indicator variable) where the dependent variable is cross-holding.

Empirical design

- *There are at least two other ways available for brand producers to deter the entry of generic producers.*
  - *What is the role of cross-holdings in the alternative not examined by the paper – listing additional patents after the initial Paragraph IV filing, or fight in court?*

- *More fundamentally, the very existence of cross-holdings might stop generic producers from Paragraph IV filing in the first place?*
  - *Is there anyway to explore this truncation bias and implications for the paper's findings?*

Other quibbles

- *First generic: "non-negligible measurement error" in identification.*
  - *What is the nature of bias?*
  - *Possible explanations for lack of significant results are highly technical.*
  - *The law change in 2003 further muddy the waters.*

- *Settlement date:*
  - *Following Drake et al. (2015) to search for information.*

- *To fully evaluate whether an individual settlement is anticompetitive would require detailed information on the settlement's terms, which is not available in documents available to the public.*

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Conclusions

- *This paper provides new evidence on the effect of institutional cross-holdings on generic entry in the pharmaceutical industry.*
- *Impressive data collection and comprehensive analysis!*
- *I have a number of comments that help pin down the underlying mechanisms and deal with alternative interpretations of the paper's findings.*
- *I look forward to reading the next version and best luck!*

The measurement

First Quarter of 2013	Market Cap as of end of Q1 2013 (in 000's)		
Generic firm: Mylan	$ 11,032,550		
Brand firm: Bristol-Myers Squibb	$ 67,670,927		
	Mylan	since	Bristol-Myers Squibb
VANGUARD GROUP, INC.	7.05%	2009	4.61%
BLACKROCK INC	5.03%	2007	4.50%
PAULSON & CO. INC.	4.72%	2010	0.00%
STATE STR CORPORATION	4.35%	2007	4.06%
BANK OF AMERICA CORPORATION	3.91%	2007	1.10%
WELLINGTON MANAGEMENT CO, LLP	3.68%	2007	2.46%
GOLDMAN SACHS & COMPANY	2.72%	2007	0.46%
JANUS CAPITAL MANAGEMENT LLC	2.40%	2008	0.19%
HARRIS FINANCIAL CORP	1.79%	2011	0.09%
MELLON BANK NA	1.79%	2007	1.55%
NORDEA INVT MGMT (DENMARK)	1.65%	2007	0.02%
NORTHERN TRUST CORP	1.39%	2007	1.70%
SECTORAL ASSET MANAGEMENT INC.	1.27%	2007	0.00%
INVESTEC ASSET MANAGEMENT LTD.	1.25%	Q1 2012	0.00%
COLLEGE RETIRE EQUITIES	1.22%	2007	0.52%
AMVESCAP PLC LONDON	1.22%	2007	1.11%
JPMORGAN CHASE & COMPANY	1.15%	2010	1.15%
JENNISON ASSOCIATES LLC	1.15%	2007	0.94%
ORBIMED ADVISORS, LLC	1.11%	2007	0.25%
FIDELITY MGMT & RESEARCH CO	0.89%	2010	0.40%
MSDW & COMPANY	0.86%	2007	1.12%
TCW ASSET MANAGEMENT COMPANY	0.84%	2008	0.05%
CREDIT AGRICOLE	0.82%	2007	0.04%
GEODE CAPITAL MGMT, L.L.C.	0.69%	2007	0.67%
RENAISSANCE TECHNOLOGIES CORP.	0.65%	2007	0.86%
FIRST TRUST ADVR L.P.	0.64%	2008	0.04%
LORD, ABBETT & CO. LLC	0.63%	2007	0.13%
ING GROEP N.V.	0.63%	2008	0.11%
ING INVT MGMT (NETHERLANDS)	0.59%	2008	0.07%
DEUTSCHE BK AKTIENGESELLSCHAFT	0.58%	2007	0.34%
	Top 10		Top 20
Cross holding	33.68%		33.52%

- *Your measure overlooks the difference in mcap of each firm.*
- *My RA comes up with a different top 30 shareholder list.*

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Shareholder heterogeneity

- *Holdings in the generic-brand pair differ in significance to the cross-holders. (Fich et al. 2015)*
- *13F reporting is disaggregated such that it under-estimates the influence at the family level (e.g., New England Asset Management (is a subsidiary of Berkshire Hathaway, and both have own 13F filings)*