

Competition Issues in the Indian Pharmaceutical Industry

Aditya Bhattacharjea

Fiyanshu Sindhvani

(Delhi School of Economics)

Structure of the Presentation

- Market Structure of the Indian Pharmaceutical Industry (IPI)
 - Price Cost Margin (PCM)
 - Import Competition
 - Concentration Measures
 - Regression of PCM on independent variables
 - Entry and Exit

- Trends in Mergers and Acquisitions in the IPI
- CCI and Mergers and Acquisitions

Data Sources

- Firm and Industry level data on IPI, and merger deals in the IPI sector: CMIE's Prowess Database. *Limitations:* Prowess does not cover:
 - Many private limited companies
 - Foreign firms and wholly-owned MNC subsidiaries which are not incorporated in India.
 - All unincorporated enterprises (household enterprises, single proprietorships, partnerships)
- Data on Imports and Exports: Ministry of Commerce and Industry, Department of Commerce, GOI.

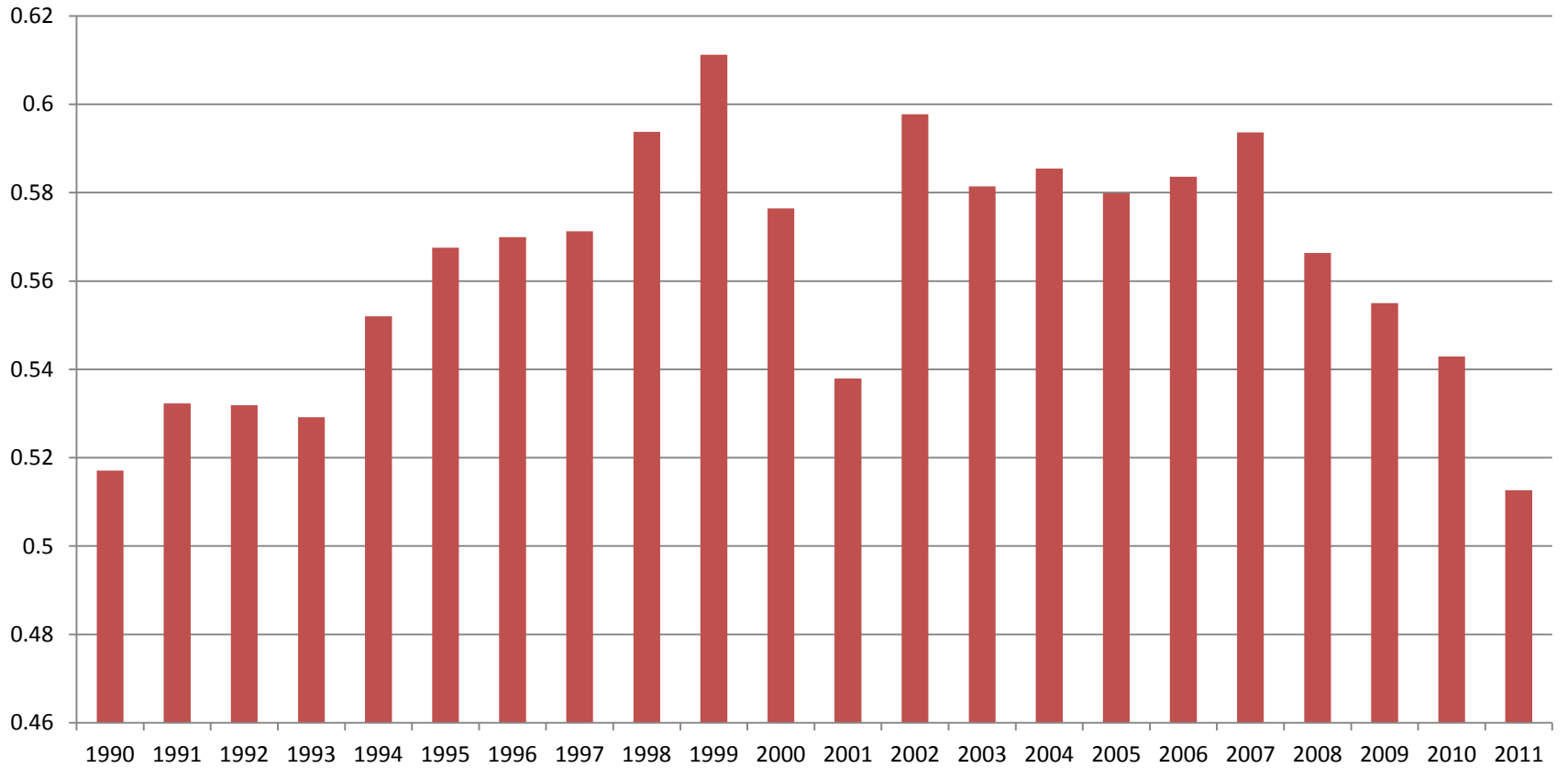
Price Cost Margin (PCM)

- PCM for the pharmaceutical industry has been calculated the following way:

$$\frac{[\textit{Value of output} - \{\textit{Salary and Wages} + \textit{Expenditure on Materials} + \textit{Expenditure on Power}\}]}{\textit{Value of Output}}$$

- The PCM has fluctuated in the period 1990-2011, the range being 0.51-0.61 and the average of 0.56

PCM

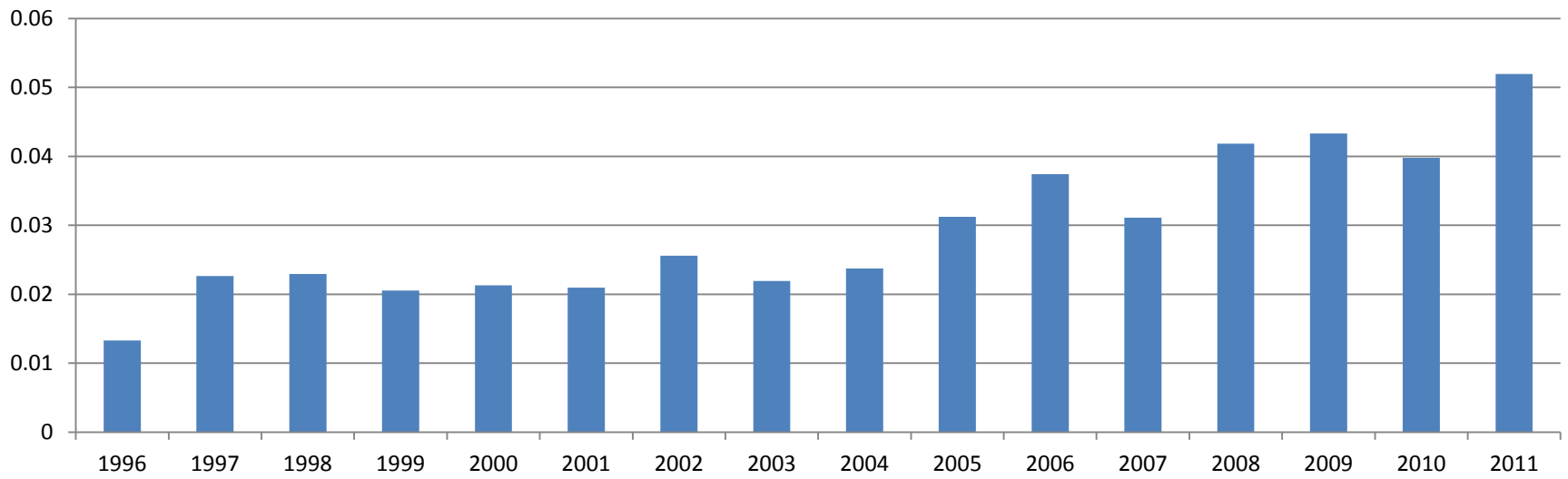


Import Competition

- Imports increase competition in an industry. We have calculated the import penetration ratio for the period 1996-2011.
- There has been a sharp increase in the ratio reflecting that the reliance on imports has increased over time. It is computed as:

$$\frac{\textit{Imports}}{\textit{Total Domestic Consumption}}$$

Import Penetration Ratio



Herfindahl Index

- It is a measure of the size of the firms in relation to the industry. It is the most common index used to measure competition in an industry
- It is calculated as follows:
- $H = \sum s_i^2$ where s_i is the market share of the i-th firm.
- and s_i is calculated as:
$$\left(\frac{\text{Sales of } i \text{ firm}}{\text{Total Industry Sales}} \right) * 100$$
- It considers the market shares of all the firms in the industry. This is the advantage of using this index over other indices.
- It ranges from 0 to 10,000

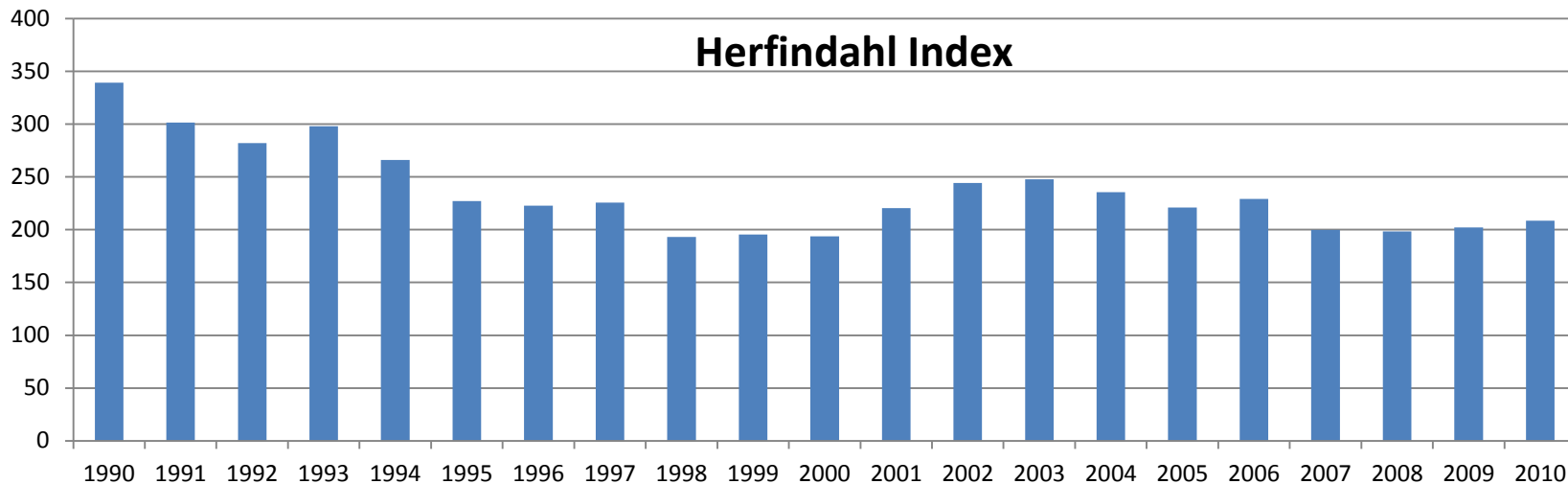
Herfindahl Index with Imports

- To look at the impact of imports on concentration, we have added the total imports into the pharmaceutical industry to the total sales in the industry to get the total market size and then calculated the market share of the firms as

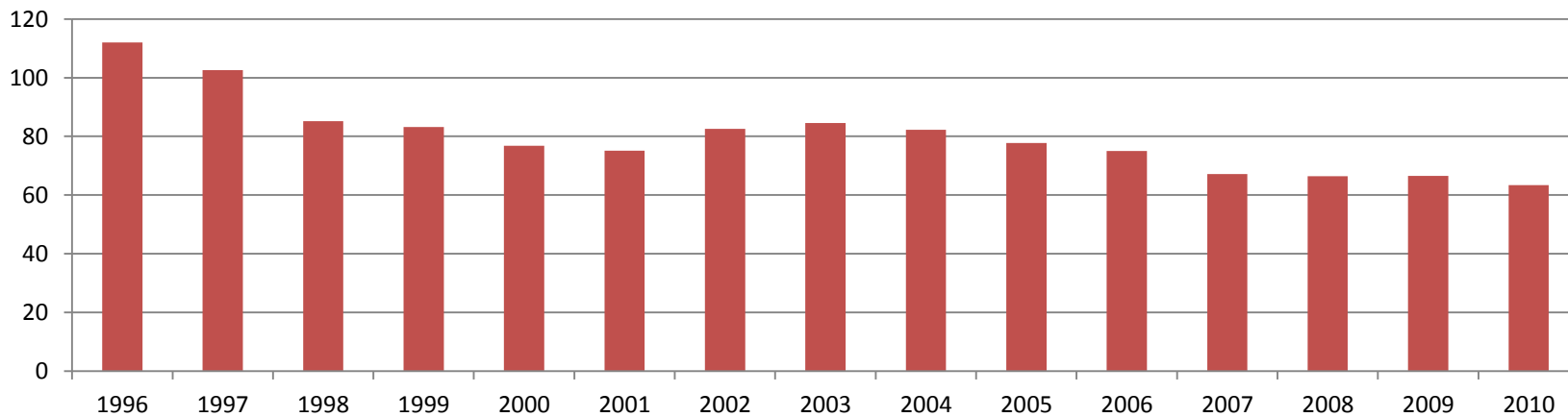
$$\left(\frac{\text{Sales of } i \text{ firm}}{\text{Total Industry Sales} + \text{Total Industry Imports}} \right) * 100$$

- The Herfindahl Index reduces after accounting for imports
- Data on imports in the Pharmaceutical industry is obtained from Ministry of Commerce and Industry, Department of Commerce, GOI. However, this data is available only for years 1996 onwards

Herfindahl Index



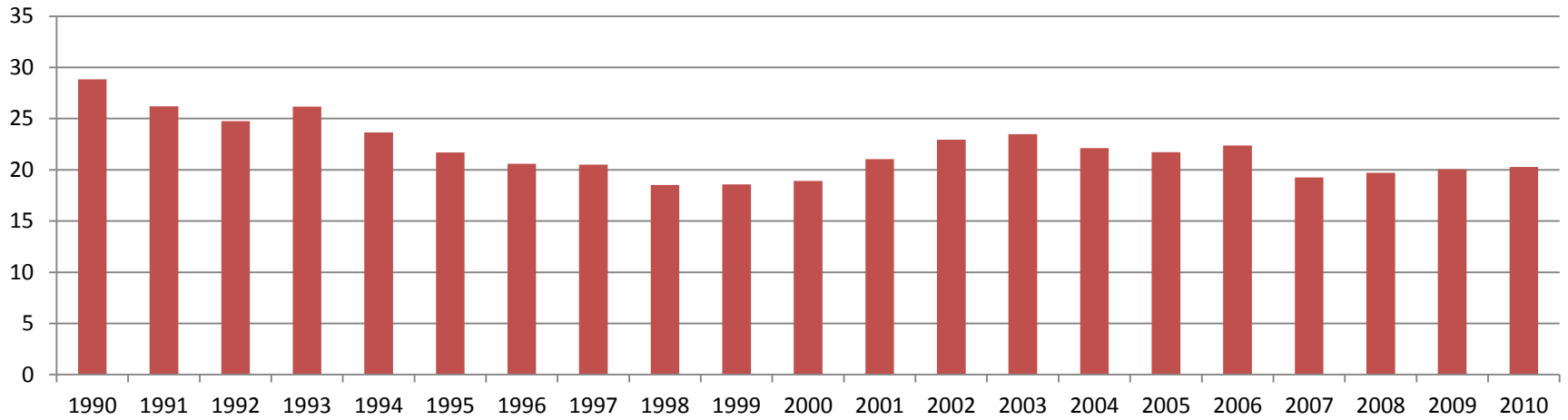
Herfindahl Index with Import



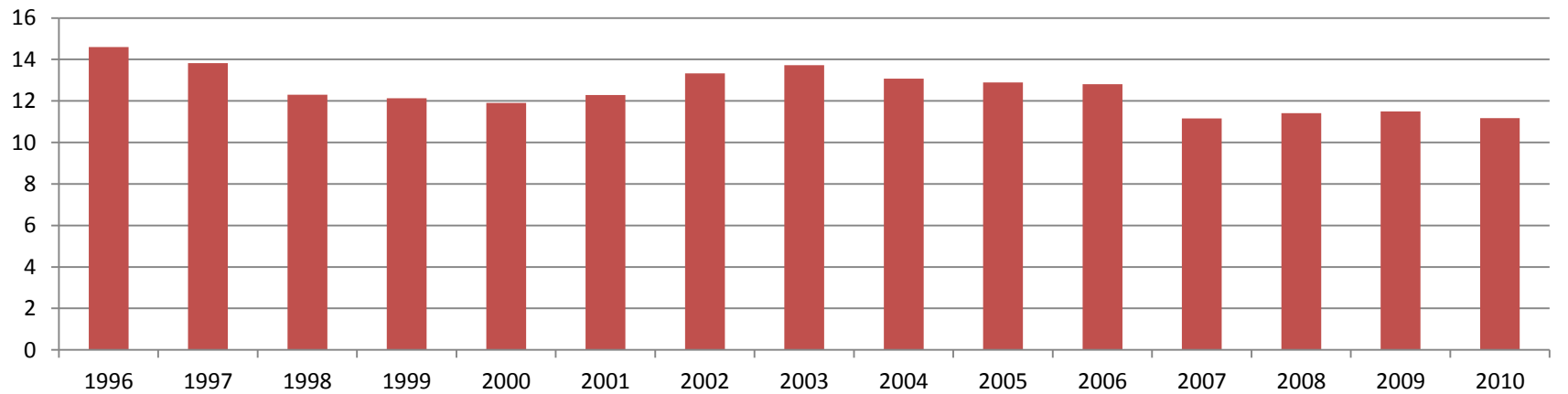
Four Firm Concentration Ratio (CR4)

- It is the sum of the market shares of four largest firms (on the basis of market share) in the industry
- It tells how much of the market is controlled by the top 4 firms
- In the Indian Pharmaceutical industry CR4 has declined over the years
- Accounting for import competition, CR4 reduces as compared to CR4 without imports

CR4



CR4 with Imports



- Both the Herfindahl index and CR4 in the industry are rather low indicating that the industry is not concentrated
- Both have declined over the years
- However, in the Pharmaceutical industry actual competition takes place at the therapeutic segments which cater to distinct diseases like cardio-vascular, anti-diabetes etc
- Using the total sales of the industry is a very crude measure of competition
- Due to lack of data at the level of therapeutic segments, we have used the total sales to measure competition.

Example of Competition at the Therapeutic Segments Level

Extent of Competition in Therapeutic Segments*

Name of the Drug	Therapeutic Category	No of Brands	Share of Top 4 Brands (Per Cent)
Ciprofloxacin	Quinolones	200	60
Levofloxacin	Quinolones	45	48
Chloroquine	Anti-Malaria	43	93
Quinine	Anti-Malaria	24	85
Rh Adults	Anti-Tuberculosis	63	79
RHEZ FD (Rifampicin +Isoniazid+ Pyrazinamide)	Anti-Tuberculosis	40	70
RHE(Rifampicin +Isoniazid+ Ethambutol)	Anti-Tuberculosis	42	65
Atorvastatin	Statins	75	47
Simvastatin	Statins	25	84
Lovastatin	Statins	15	98

Note: *The drugs categories' include all dosages and forms of individual brands.

Source: Jha (2007)

Determinants of the Price Cost Margin in the IPI: Structure-Conduct-Performance Analysis

Econometric Analysis

- We have tried to study the determinants of the Price Cost Margin in the IPI
- We have done a panel data analysis at the firm level
- Data has been taken from Prowess database for the years 1990-2011
- There are 609 pharma firms listed in the Prowess database
- The possible explanatory variables can be:
 1. Market Share
 2. Market Share Squared
 3. Advertising and Marketing Expenditure
 4. Research and Development Expenditure
 5. Export Intensity of the firms
 6. TRIPS period

Regression Results

- Market Share is a significant variable that affects the PCM positively
- The coefficient on market share squared is negative indicating that as the firm's market share increases beyond a point, its PCM goes down
- Advertising and Marketing Expenditure is also a significant variable. The sign is negative. This could be because the returns from these activities are realized with a lag
- The coefficient of R&D is positive but insignificant
- Export Intensity affects the PCM in a negative way but the coefficient is insignificant
- To capture the affect of the TRIPS regime on the PCM of the firms, we have divided the period into 3 parts:
 - 1990-1994 (Pre Trips Period)
 - 1995-2004 (Transition Period)
 - 2005 onwards (Post Trips Period)

TRIPS and its impact on PCM

- Pre Trips period has been taken as the base category and 2 dummies are created:
 - Trips for the period (1995-2004)
 - Post Trips (2005 onwards)
- The coefficients on both Trips and Post Trips are significant
- They are both negative indicating that as compared to the Pre Trips period the PCM of the firms in the IPI has gone down in both the following periods

Entry and Exit of Firms in the IPI

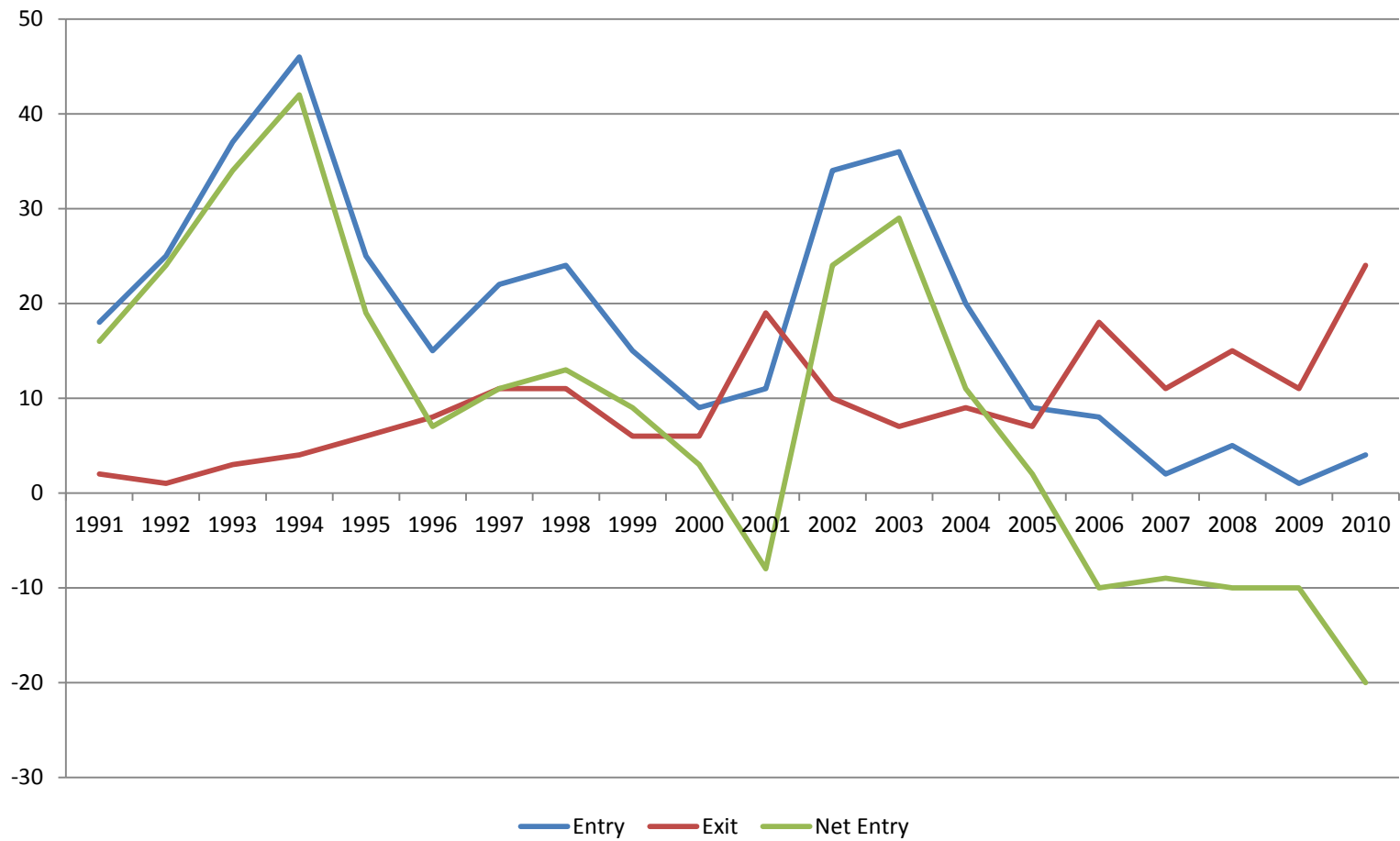
Entry-Exit

- 1990 is taken as the base year because of availability of data from CMIE's Prowess database
- 'Entry' in our analysis means those firms that have zero sales of goods in 1990 but show a positive sales of goods in any year after 1990. For example, if firm A as zero sales of goods in 1990 but shows positive sales of goods in 1992, firm A is presumed to be making entry in 1992.
- 'Exit' in our analysis means those firms that had positive sales of goods in any year beginning 1990 but then reported zero sales between a particular year and 2010. For example if firm B had positive sales of goods till 1995 and zero sales of goods between 1996 and 2010, then firm B is presumed to have exited in year 1996.
- In 1990, 88 firms were reporting positive sales.
- In the following years entry , exit and net entry is recorded.

Entry-Exit

- Net entry shows rising and falling trends but after 2005 there has been a consistent fall in the net entry.
- Between 1990 and 2010, 189 firms have exited the industry of which $1/3^{\text{rd}}$ of them exited after 2005, which is also the Post-TRIPS period.
- 366 firms have entered between 1990 and 2010, but entry in more recent years has been less than exit → net exit after 2005.

Year	Entry	Exit	Net Entry	Number of Operational Firms
1990				88
1991	18	2	16	104
1992	25	1	24	128
1993	37	3	34	162
1994	46	4	42	204
1995	25	6	19	223
1996	15	8	7	230
1997	22	11	11	241
1998	24	11	13	254
1999	15	6	9	263
2000	9	6	3	266
2001	11	19	-8	258
2002	34	10	24	282
2003	36	7	29	311
2004	20	9	11	322
2005	9	7	2	324
2006	8	18	-10	314
2007	2	11	-9	305
2008	5	15	-10	295
2009	1	11	-10	285
2010	4	24	-20	265
2011	0	93	-93	172



Reasons for Exit

- We have tried to investigate the reason of exit of firms in the industry.
- Firms can exit on account of the following:
 - Being merged into another company
 - Being acquired by another company
 - Shut down
- Exit of 32 firms can be attributed to mergers and acquisitions

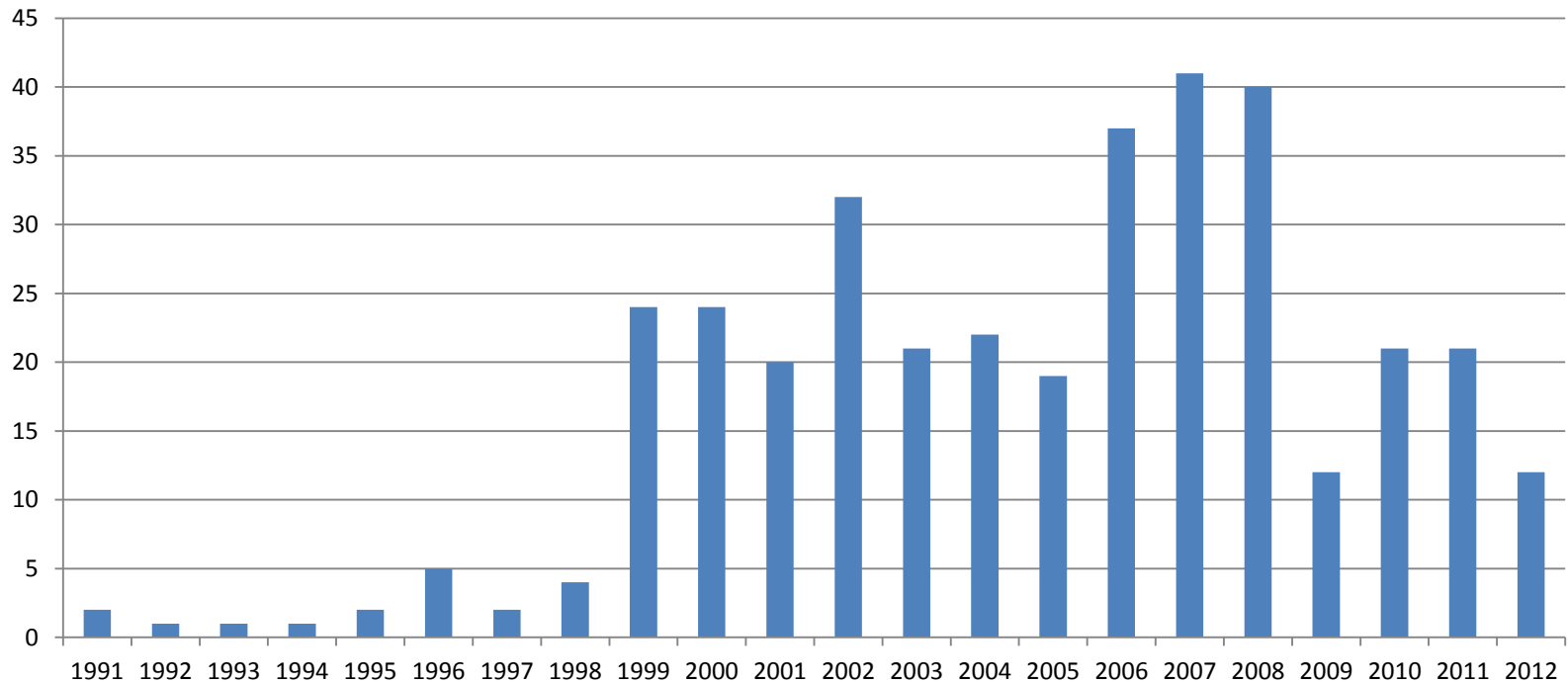
Company Name	Last Year of Positive Sales	Date of Deal	Type of Deal
Alpha Drug India Ltd. [Merged]	2005	14-May-05	Merger
Amit Alcohol & Carbon Dioxide Ltd. [Merged]	1996	31-Mar-96	Merger
Croslands Research Laboratories Ltd. [Merged]	1996	31-Mar-96	Merger
Geoffrey Manners & Co. Ltd. [Merged]	2002	10-Jul-02	Merger
Gujarat Lyka Organics Ltd. [Merged]	1999	07-Nov-99	Merger
Harleystreet Pharmaceuticals Ltd. [Merged]	2010	12-Aug-10	Merger
Indon Healthcare Ltd.	2000	11-Mar-00	Merger
John Wyeth (India) Ltd. [Merged]	1997	31-Mar-97	Merger
Rhone-Poulenc (India) Ltd. [Merged]	2001	13-Apr-01	Merger
Sandoz (India) Ltd. [Amalgamated]	1996	31-Mar-96	Merger
Solvay Pharma India Ltd. [Merged]	2010	24-Nov-10	Merger
Sreenivasa Pharma Pvt. Ltd. [Merged]	2007	30-Oct-07	Merger
Sri Chakra Remedies Ltd. [Merged]	2000	23-Oct-00	Merger
Tamilnadu Dadha Pharmaceuticals Ltd. [Merged]	1997	31-Mar-97	Merger
Triton Laboratories Ltd.	2000	16-May-00	Merger
V V S Pharmaceuticals & Chemicals Pvt. Ltd. [Merged]	2006	06-May-06	Merger
Wyeth Laboratories Ltd. [Merged]	1996	31-Mar-96	Merger

Company Name	Last Year of Positive Sales	Date of Deal	Type of Deal
Alved Pharma & Foods Pvt. Ltd.	2008	31-Mar-08	Substantial Acquisition
Ciba Ckd Biochem Ltd. [Merged]	2000	30-Nov-00	Substantial Acquisition
German Remedies Ltd. [Merged]	2002	11-Apr-01	Substantial Acquisition
		18-Apr-02	Substantial Acquisition
Indon Healthcare Ltd.	2000	11-Mar-00	Substantial Acquisition
Solvay Pharma India Ltd. [Merged]	2010	17-Dec-04	Substantial Acquisition
		17-Feb-10	Substantial Acquisition
Burroughs Wellcome (India) Ltd. [Merged]	2003	31-Jul-00	Minority Acquisition
		17-Sep-03	Minority Acquisition
Doctors Organic Chemicals Ltd.	2005	14-Nov-05	Minority Acquisition
Smithkline Beecham Pharmaceuticals (India) Ltd. [Amalgamated]	2000	31-Jul-00	Minority Acquisition

Company Name	Last Year of Positive Sales	Date of Deal	Type of Deal
American Remedies Ltd. [Merged]	2000	18-May-99	Sale of Assets
		09-Sep-00	Sale of Assets
Bharat Serums & Vaccines Ltd.	2010	22-Apr-10	Sale of Assets
German Remedies Ltd. [Merged]	2002	20-Dec-02	Sale of Assets
Onco Therapies Ltd.	2010	18-Mar-10	Sale of Assets
Parke-Davis (India) Ltd. [Merged]	2001	23-May-99	Sale of Assets
		03-Jul-01	Sale of Assets
Rhone-Poulenc (India) Ltd. [Merged]	2001	09-May-01	Sale of Assets
S O L Pharmaceuticals Ltd.	2000	09-Mar-00	Sale of Assets

Merger and Acquisition Activity

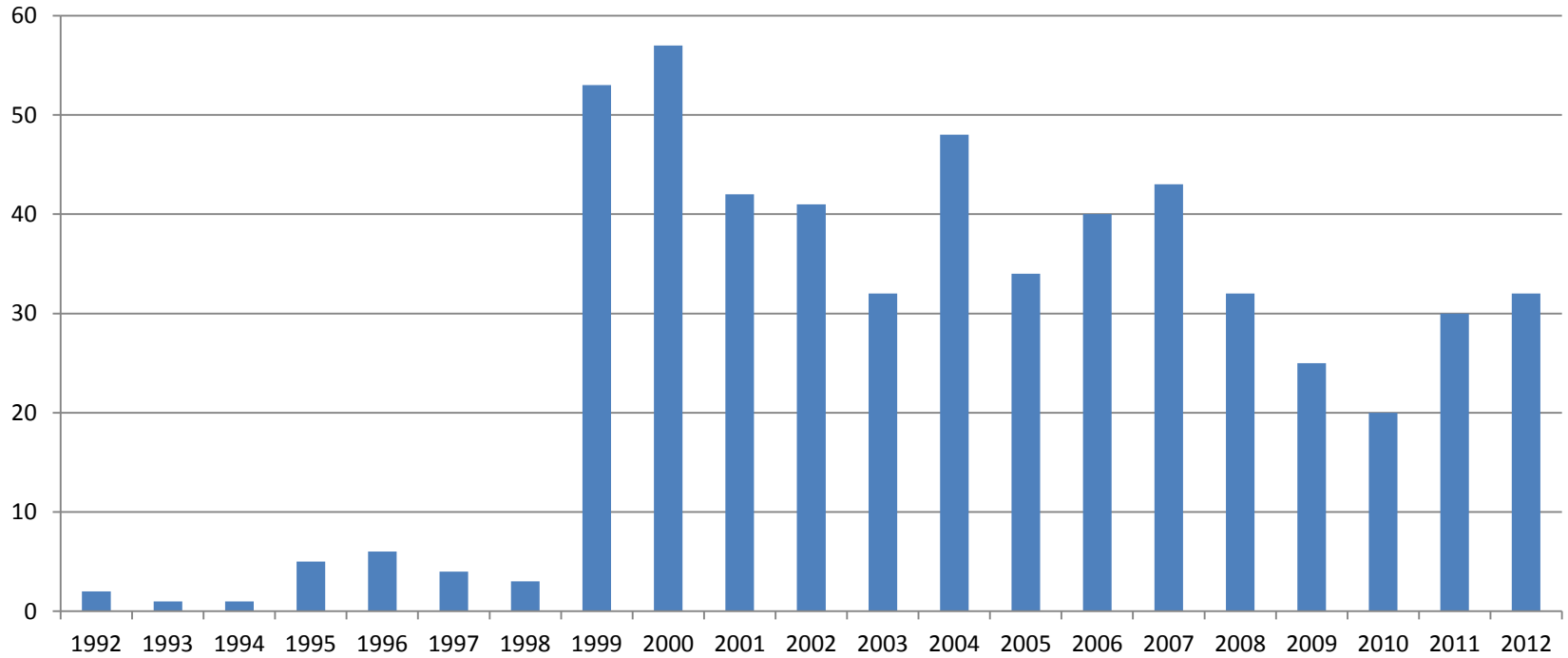
M&A Deals where Pharma companies are Acquirers (No. of Deals)



The M&A activity in which the pharma companies were the acquirers has gone up in years following 1998

After 2005 there has been a substantial increase in the number of M&A deals in the industry

M&A Deals where pharma companies are the targets (No. of Deals)



Here also, the M&A activity has increased after 1998

Review of Pharma M&A Deals Conducted by CCI

CCI and Mergers & Acquisitions

- The Competition Act was enacted in 2002 but various legal challenges delayed its implementation and the CCI was not fully constituted till 2009
- The act came into force in phases, with the provisions regulating anticompetitive agreements and abuse of dominance coming into effect in May 2009
- The merger control provisions and the accompanying Combination Regulations becoming effective in June 2011

Jurisdictional Thresholds Under the Act

In India	Applicability	Assets	Turnover
	For acquirer and target (combined)	INR. 1,500 crores (USD 300 million) ⁴	INR. 4,500 crores (USD 900 million)
	For “Group” (to which target belongs post-acquisition)	INR. 6,000 crores (USD 1.2 billion)	INR. 18,000 crores (USD 3.6 billion)

In India and Outside India	Applicability	Assets		Turnover	
		Total	Minimum in India	Total	Minimum in India
	For acquirer and target (combined)	USD 750 million	INR. 750 crores (USD 150 million)	USD 2.25 billion	INR. 2,250 crores (USD 450 million)
For “Group” (to which target belongs post-acquisition)	USD 3 billion	INR. 750 crores (USD 150 million)	USD 9 billion	INR. 2,250 crores (USD 450 million)	

Source: Merger Control In India, CPI Antitrust Chronicle

Deals Screened by CCI :-

- Out of 79 CCI orders on merger cases between June 2011 – October 2012, only 4 involved the IPI sector.
- All 4 of these got approved
- The basis of approval of deals has been the following:
 - ✓ The ultimate control over the parties in the combination remains the same before and after the combination (intra-group reorganization).
 - ✓ Companies not engaged in similar businesses and no vertical integration (conglomerate merger).
 - ✓ Absence of one of the parties in India in the business of the other party
 - ✓ Significant presence of other players (no AAEC)

1)

- **Firms Involved:** Reckitt Benckiser Investments India Private Limited (RBI IPL), Paras Pharmaceuticals Limited (PPL) **and** Halite Personal Care India Private Limited (HPCIL)
- **Date of Application:** 23rd February 2012 **Date of Order:** 8th May 2012
- **Section of the Act:** 5 (c)
- The proposed combination relates to **merger** of RBI IPL with PPL as the first step and de-merger of personal care division of PPL into and with HPCIL as the second step.

2)

- **Firms Involved:** Orchid Research Laboratories Limited (ORLL) **and** Orchid Chemicals and Pharmaceuticals Limited (OCPL)
- **Date of Application:** 3rd February 2012 **Date of Order:** 29th February 2012
- **Section of the Act:** 5 (c)
- The proposed combination is a **merger** of ORLL into OCPL pursuant to a scheme of amalgamation under the Companies Act, 1956.

3)

- **Firms Involved:** Mitsui & Co. Limited (Mitsui) **and** Arch Pharma Labs Limited (Arch)
- **Date of Application:** 9th August 2012 **Date of Order:** 19th September 2012
- **Section of the Act:** 5 (a)

- The proposed combination relates to **acquisition** of 26.71% equity shares of Arch by Mitsui. Mitsui already holds 5.25% of the equity share capital of Arch.

4)

- **Firms Involved:** G&K Baby Care Private Limited (G&K), Danone Asia Pacific Holdings Pte Limited (Danone Asia Pacific), Wockhardt Limited (Workhardt) and Carol Info Services Limited (Carol) **and** Wockhardt EU Operations (Swiss) AG (Workhardt EU)
- **Date of Application:** 24th August 2011 **Date of Order:** 15th September 2011
- **Section of the Act:** 5(a)

- The proposed combination relates to **acquisition** by G&K Baby Care Private Limited and Danone Asia Pacific Holdings Pte Limited (acquirers) of certain assets of Wockhardt Limited and Carol Info Services Limited and Wockhardt EU Operations (Swiss) AG (collectively referred to as Workhardt Group). The combination comprises of the following acquisitions:

Deals Overlooked by CCI

- In a few deals, we also found that the combined assets and the turnovers of the parties in a deal were well above the CCI threshold, yet they were not screened by the CCI
- Why were they overlooked?

Deals where Pharma Companies are the 'Acquirers'

Company Name	Assets	Turnover	Deal Type	Date	Target Company	Assets2	Turnover 2	Combined Assets	Combined Turnover
	Rs Million	Rs Million				Rs Million	Rs Million	Rs crore	Rs Crore
Dr. Reddy'S Laboratories Ltd.	102673	50311	Sale Of Asset	22-Jul-11	J B Chemicals & Pharmaceuticals Ltd.	10118.2	7276.1	11279.12	5758.71
Piramal Enterprises Ltd.	170400.2	14675.5	Takeover Minor	10-Aug-11	Vodafone India Ltd.	152525.7	NA	32292.59	NA
Piramal Enterprises Ltd.	176404.1	9388.8	Takeover Minor	04-Feb-12	Vodafone India Ltd.	152525.7	NA	32892.98	NA
Serum Institute Of India Ltd.	21531	5669	Takeover Minor	25-Oct-11	Panacea Biotech Ltd.	18946.5	10782	4047.75	1645.1
Serum Institute Of India Ltd.	21531	5669	Takeover Minor	19-Dec-11	Orchid Chemicals & Pharmaceuticals Ltd.	38883.8	15794.6	6041.48	2146.36
Serum Institute Of India Ltd.	21531	5669	Takeover Minor	20-Dec-11	Orchid Chemicals & Pharmaceuticals Ltd.	38883.8	15794.6	6041.48	2146.36
Serum Institute Of India Ltd.	21531	5669	Takeover Minor	20-Jul-12	Orchid Chemicals & Pharmaceuticals Ltd.	39468.8	16264.4	6099.98	2193.34

Colour	Meaning
Light Blue	Target Company's Assets/Turnover above the threshold
Red	Combined Assets/Turnover above the Threshold
Olive Green	Conglomerates

Deals where Pharma Companies are the 'Targets'

Company Name	Assets	Turnover	Deal Type	Date	Acquirer Company	Assets2	Turnover2	Combined Assets	Combined Turnover
	Rs Million	Rs Million				Rs Million	Rs Million	Rs crore	Rs Crore
J B Chemicals & Pharmaceuticals Ltd.	10118.2	7276.1	Sale Of Asset	22-Jul-11	Dr. Reddy'S Laboratories Ltd.	102673	50311	11279.12	5758.71
Biocon Biopharmaceuticals Pvt. Ltd.	2395.3	101.9	Merger	26-Jul-12	Biocon Ltd.	28308	13656	3070.33	1375.79
Elder Health Care Ltd.	751	486.3	Merger	02-Aug-12	Elder Pharmaceuticals Ltd.	17276.7	9924.9	1802.77	1041.12
Tonira Pharma Ltd. [Merged]	580	303.2	Merger	17-Sep-11	Ipca Laboratories Ltd.	19185.9	18787	1976.59	1909.02
Orchid Chemicals & Pharmaceuticals Ltd.	38883.8	15794.6	Takeover Minor	19-Dec-11	Serum Institute Of India Ltd.	21531	5669	6041.48	2146.36
Orchid Chemicals & Pharmaceuticals Ltd.	38883.8	15794.6	Takeover Minor	20-Dec-11	Serum Institute Of India Ltd.	21531	5669	6041.48	2146.36
Orchid Chemicals & Pharmaceuticals Ltd.	39468.8	16264.4	Takeover Minor	20-Jul-12	Serum Institute Of India Ltd.	21531	5669	6099.98	2193.34
Panacea Biotec Ltd.	18946.5	10782	Takeover	25-Oct-11	Serum Institute Of India Ltd.	21531	5669	4047.75	1645.1

Proposals for future work

- Concentration indices and market structure analysis to be modified taking into account the non-corporate sector
- *Updating Natasha's paper*
 - Analysis of drug price control regime in light of Supreme Court's orders (awaited).
 - More recent IPR cases
 - State of play in CEPA negotiations with regard to TRIPS-Plus conditions.
 - The debate on prohibition of branded generics.
 - Public procurement and distribution of generics (based on Tamil Nadu experience)
- All these to be classified according to the OECD checklist
- *New topics*
 - Anti-competitive practices in distribution – review of CCI orders in cases involving chemists' associations.
 - Impact of international pharma cartels on India (updating Levenstein-Suslow-Evenett)
 - Effect of antidumping duties on import competition

Regression Results

```
. xtreg PCM ms_ mssqrd_ AdMkt RD EX Trips PostTrips, re robust
```

```
Random-effects GLS regression           Number of obs   =       147
Group variable: cid                     Number of groups =        27

R-sq:  within = 0.8361                  Obs per group:  min =         1
        between = 0.7623                                     avg  =         5.4
        overall = 0.8094                                     max  =         14

                                           Wald chi2(7)    =       483.50
corr(u_i, X) = 0 (assumed)              Prob > chi2     =       0.0000
```

(Std. Err. adjusted for 27 clusters in cid)

PCM	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
ms_	.0659083	.032164	2.05	0.040	.0028681	.1289485
mssqrd_	-.0036377	.0027199	-1.34	0.181	-.0089687	.0016932
AdMkt	-1.72519	.1171373	-14.73	0.000	-1.954775	-1.495605
RD	.1922511	.3259531	0.59	0.555	-.4466053	.8311074
EX	-.1055392	.0857998	-1.23	0.219	-.2737038	.0626253
Trips	-.0757583	.0230714	-3.28	0.001	-.1209774	-.0305391
PostTrips	-.0610344	.0200447	-3.04	0.002	-.1003212	-.0217476
_cons	.6233765	.0787601	7.91	0.000	.4690095	.7777434
sigma_u	.16395088					
sigma_e	.087086					
rho	.77994424	(fraction of variance due to u_i)				