Does Openness Promote Competition? A Case Study of Indian Manufacturing

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A Case Study of Indian Manufacturing

This paper uses firm level data for the period 1989-2001 to analyse the working of competition in India's manufacturing sector. It examines the impact of greater competition on profit mark-up over the last decade. The econometric analysis of the factors determining mark-up indicates that, contrary to received wisdom, trade openness by itself does not act to reduce the profit mark-up. The paper also investigates the degree of competitiveness defined as the Lerner price-cost margin. The analysis indicates that the estimated margins are in general high over the 1990s across all industries and in most of the industries considered these margins have been increasing over the second-half of the 1990s. The market by itself does not bring about competitive outcomes. The regulatory agencies probably have a crucial role to ensure a level playing field.

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I Introduction

An important feature of developing country policies in the last decade has been the enactment of Competition Acts as part of a pro-competition policy [Hoekman 2002]. While a multilateral competition policy is no longer a part of the agenda of the WTO, the Doha declaration of 2001 relates competition policy to trade policy and emphasises reinforcement of competition policy in developing countries through capacity-building.

India too has substantially improved the competition climate in its manufacturing sector since 1991 via a series of changes in both domestic and trade polices. However, as avenues for competition have increased, at the same time the government has also put in place a set of regulatory agencies with the objective of promoting competition. As trade theorists are prone to argue, if the economy is open to market forces, then the market players would themselves enforce competitive outcomes. This would be particularly true for countries (like India) which are classified as small countries in the world economy with a share of world trade under 1 per cent. If this proposition is accepted, then it would follow that the only objective of regulatory agencies would be setting the rules of the game rather than monitoring the degree of competition. Yet, the terms of reference of the regulatory agencies often include a clause requiring the active promotion and monitoring of competitive forces [see, for example, *Competition Act* 2002; *Electricity Act* 2001]. One hypothesis commonly quoted in the literature is that imports can raise the level of competition in the domestic industries and reduce profit mark-up. The theoretical framework and econometric specification for this kind of study are provided by Levinsohn (1993) and Metin-Oxcan (2000). However, the empirical evidence on this is at best inconclusive.

Levinsohn (1993) tests the imports-as-market discipline hypothesis in case of Turkey in the light of reduced import protection in the decade of the 1980s and reduction in tariffs, though to a lesser extent in some of the manufacturing industries. The estimation of an oligopolistic structural equation model revealed that price mark-up (price/marginal cost) declined in imperfectly competitive industries in which protection declined and increased in imperfectly competitive industries in which protection increased. From this result Levinsohn concludes that the results can be taken as evidence for supporting the imports as market discipline hypothesis.

In a similar exercise, Krishna and Mitra (1998) try to study the impact of trade liberalisation on certain sectors of the Indian manufacturing sector, namely, electronics, electrical machinery, non-electrical machinery and transport equipment. The estimated mark-ups defined as profit/(raw material cost+ energy consumption expenditure+wages) decline after liberalisation except in the electrical machinery industry, thereby confirming the market discipline hypothesis. However, the effect of liberalisation on technology and hence productivity is ambiguous depending upon the conditions of the home country. However, there also exists some literature that does not support the hypothesis very clearly.

In a study pertaining to Australia, Jayanthakumaran (1999) runs separate regressions to find the effect of liberalisation on labour productivity growth, export growth and changes in the price-cost margin.[1] He found that labour productivity is negatively, but weakly related to change in the effective rate of protection. The growth in exports has been negatively related to the effective rate of protection and positively related to the internal demand variable (implying improvement in productivity and increased intra industry trade) and index of scale variable (implying increased impact of entry barriers). However, the result that stands out is that the influence of change in the effective rate of protection on price cost margins has been negative implying that openness has not reduced price cost margins. For this, two explanations have been forwarded. Firstly, it could be a case where there is a monopoly element at work in the Australian industry. Moreover, the effective protection estimate is the mere reflection of the pricing policy, which in this case would tend to diminish slowly over time. Secondly, the effect of labour productivity on price cost margins is positive and hence the author concludes that the increase in labour productivity has been transformed into higher price cost margins.

Harrison (1994) has tested for changes in productivity and market structure due to trade liberalisation in the manufacturing

sector of Cote de'Ivoire. In a Cournot setting of firm behaviour she found that mark-ups (price/marginal cost) do decline in the heavily protected sectors after trade liberalising measures are implemented, but not in the case of other sectors. She also found that price cost margins are higher in sectors with lower import penetration and higher tariffs. Changes in productivity growth due to openness were also assessed using three approaches, viz, differentiating between pre-reform and post-reform, low and high tariff regimes and low and high import penetration period. It was found that open trade policies increased productivity.

Metin-Ozcan et al (2000) also analysed the changes in market concentration and accumulation patterns in the case of Turkey for the period 1980-96. They found that openness has a very small, but negative influence on industrial concentration. They also found that openness reduces profit margins, though to a lesser extent, while concentration and real wage costs increases profit margins to a greater extent. The study concludes that the outward orientation of the economy has not brought much benefit in terms of the extent of reduction in industrial concentration and the authors attribute this to institutional and technological barriers in the country.

Roberts (1998) has dealt with the changes in industrial concentration in Poland between 1988 and 1993 to evaluate the effects of trade liberalising measures in 1989. She found that though the average concentration for the industry as a whole has declined in the period, in some sectors concentration has actually increased. The sectors in which concentration has increased were previously less concentrated, with high capital-output ratio and shrinking demand. They also found that among the less concentrated industries, competition has increased in the consumer industries. The latter trend is due to tougher price competition.

The objective of this study is threefold. First, an attempt is made to quantify how the policy changes have increased the competiveness of the Indian manufacturing sector. Second, we estimate the role of trade policy in promoting competition. Third, we estimate the changes in the degree of monopoly power in Indian manufacturing industry in the last decade. In the following section we indicate our main database. In Section III, we first investigate if the changes in domestic and trade polices since 1991 have in fact promoted competition. In Section IV, we outline the explanatory model used to estimate the impact of polices on a measure of competition. Here, we also set out and estimate a model to measure the degree of monopoly power. Finally, in Section V, some policy conclusions are noted.

I
Database

The primary source of data for the empirical exercises of this paper is the PROWESS database of the Centre for Monitoring the Indian Economy (CMIE). This database contains information on about 8,000 companies, which includes companies that are public, private, cooperative, joint stock, listed or otherwise. This wide coverage encompasses almost 70 per cent of the economic activity of the organised sector, both manufacturing and non-manufacturing (our focus remains essentially on the manufacturing sector of the Indian industry). CMIE's methodological framework for data standardisation, via formal validation and quality control, render inter-year, inter-industry and inter-company data comparable. The variables used in the equations of the models below have been constructed from data taken from the PROWESS database. The econometric testing in Section IV are based on balanced panels. The time period of our study is 1989-2001 for which data was available.

II
Policy Changes after 1991

The most important policy change after 1991 was the Industrial Licensing Policy of 1991 which significantly improved the conditions of entry for both domestic and foreign firms. Our database allows us to quantify this entry in terms of the date of incorporation of new firms after 1989. While this is an imperfect measure in that it does not imply new production starts, nor does it control for bogus firms, nevertheless it does indicate the intentions and perceptions of new firms.

The data in Table 1 clearly indicates the big rush for entry of new firms, particularly in the first period after 1989 and till 1995. The reduced numbers after 1995 probably reflect the adjustment of new entry to the size of the domestic market and the fact that the growth rate of sales across all industries declined perceptibly after 1995 [Das and Pant 2004]. Another possible indicator of

Table 1: Gross Entry of New Firms in Manufacturing in India, 1989–2003

Sector	1989–1995	1996–2003
Manufacturing	1656	284
Food and beverages	285	23
Textiles	251	26
Chemicals	394	95
Non-mettallic mineral products	96	12
Metals and metal products	153	20
Machinery	338	122
Transport equipment	28	23
Services	1002	128

Source: PROWESS database.

Table 2: Share of Public Sector Enterprises (PSEs) in Aggregate Sales of the Industry, 1988–89–2000–01

Sectors	April 1988 to March 1989		April 1994 to March 1995		April 2000 to March 2001	
Mining	PSE Share (Per Cent)	No of Firms	PSE Share (Per Cent)	No of Firms	PSE Share (Per Cent)	No of Firms
Coal and lignite	100	6	99.47	8	98.2	7
Crude oil and natural gas	100	2	97.38	2	99.17	3
Minerals	65.97	5	57.97	7	62.24	8
Electricity (gen+dist)						
Electricity	54.19	6	64.43	7	73.31	7
Service (fin+non fin)						
Financial service	31.77	2	81.48	69	80.31	89
Health service	0	0	1.48	1	0	0
Hotel and tourism	26.05	2	16.08	4	11.55	3
Recreational service	0	0	0	0	4.63	1
Transport service	88.6	8	76.28	8	76.51	11
Communication	100	3	51.24	3	62.6	2
Trading	78.62	15	48.42	20	46.06	17
Construction						
Construction	30.42	7	22.75	8	5.55	10
Irrigation						
Irrigation	0	0	0	0	0	0
Manufacturing						
Chemical	65.74	31	59.06	42	64.79	39
Metals and metal product	53.78	12	41.6	15	30.26	13
Non-metallic minerals	7.74	4	3.51	4	1.37	5
Textiles	12.73	16	2.68	14	1.85	16
Transport equipment	13.33	14	9.67	16	4.17	14
Machinery	39.04	18	21.98	33	15.04	25
Food and beverages	4.42	2	0.64	6	0.74	8

Note: Authors' calculations from PROWESS database. PSE excludes departmental undertakings.

the changing nature of competition is the relative share of public sector enterprises (PSE) and private sector enterprises (PVT) in total sales. This is shown in Table 2.

As is clear from Table 2, the share of PSEs has declined in most cases, barring some service sectors like financial services. For our purposes, the most noteworthy is the decline in the share of PSEs in manufacturing sector sales. The limited fall in the case of chemicals is explained by the dominance of state-owned oil companies. It is pertinent to note that the declining share of the PSE is due to new entry of private sector enterprises. This is clear from the fact that privatisation of PSE has not been an important factor in contributing to a declining share of PSE in sales. According to the Economic Survey, 2003-04, the total stock realisation from privatisation proceeds in the period 1991-92 – 2001-02 of Rs 260 billion accounts for only 10 per cent of the flow of manufacturing output in 2001-02.

The pro-competition stance in trade policy has been equally remarkable. Apart from making the exchange rate more market-oriented, the main thrust of trade policy changes have been to reduce quantitative restrictions on imports, reduce import tariffs and end selective protection for the small-scale industries. This is clear from Tables 3, 4 and 5.

While the purist may argue that the decline in tariff protection as shown in Table 4 does not imply a decline in effective protection, other studies have shown that the level of effective protection even at the disaggregated industry level follows the same trend as nominal tariffs [see, for example, Das and Pant 2004; Nouroz 2001].

Finally, we have tried to measure foreign entry as foreign direct investment (FDI). Here we calculated the share of foreign companies (defined as those with more than 10 per cent foreign equity) in total industry sales for our reference period. The disaggregated data is shown in Table 6, which presents a mixed picture. While in about half of the industries the share of foreign companies has increased, in the others it has declined. Significantly, in the case of the pharmaceutical sector, the share of foreign companies has declined quite perceptibly.

The primary purpose of this section was to show that policy changes since 1991 considerably eased the conditions of entry, both for domestic and foreign firms. In particular, our data shows that the share of the government sector (PSE) declined quite remarkably in some cases, indicating that the manufacturing field was opened up for greater private sector initiative. More specifically, there seemed to have been considerable scope for market-based competition after 1991.

IV
Econometric Models and Results

In this section, we will first investigate the hypothesis that imports exert a significant negative impact on the level of profit mark-up of firms. This is the most commonly used hypothesis in the literature. Other variables given below are used to control for domestic factors that influence mark-up.

Imports-as-Market-Discipline Hypothesis

The regression model for testing this "imports-as-market-discipline" hypothesis is usually specified as:

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Mark-up = f (openness, CR4, wage, foreign, ind dummies, time dummies)

Table 3: Changes in Quantitative Restrictions

Total number of tariff lines as on 01-04-1996	10202 (10 digit)
Tariff lines freed as on 01-04-1996	6161
Tariff lines freed for import during 1996-97	488
1997-98	391
1998-99	894
1999-2000	714
2000-2001	715

Source: Economic Survey, various issues.

Table 4: Average Nominal Import Tariffs, 1991–2004

Year	Tariff (Per Cent)
1991-92	Reduced to 150
1992-93	110
1993-94	85
1994-95	65
1995-96	50
1996-97	50
1997-98	45
1998-99	45
1999-2000	40
2000-01	35
2001-02	30
2002-03	25
2003-04	20

Source: Economic Survey, various issues.

Table 5: Changes in Number of Items Reserved for SSI

Year	Items Reserved for SSI	Items on OGL	Remaining Items under Reserved List
1998-99	821	478	343
1999-2000	812	576	236
2000-2001	812	643	169
2001-2002	799	799	NIL

Source: http://www.smallindustryindia.com/policies/preseve.htm

Table 6: Shares of Foreign Companies in Total Industry Sales, 1989–2001

(Percent)

Sl No	Sector	1989	1995	2001
1	Auto ancillary	14.30	17.72	15.61
2	Automobile	13.44	25.74	36.30
3	Beverages and tobacco	61.71	65.69	64.43
4	Cotton textiles	5.54	5.89	4.43
5	Drugs and pharmaceuticals	46.68	30.43	20.01
6	Dyes and pigments	40.97	29.71	28.84
7	Electrical machinary	33.57	30.88	25.39
8	Electronics	16.08	14.00	12.51
9	Fertilisers	0.25	2.20	0.02
10	Financial services	44.43	7.87	7.71
11	Food products	16.15	14.23	14.88
12	Inorganic chemicals	7.42	7.73	5.89
13	Metal and metal products	1.40	3.14	5.85
14	Non-electrical machinary	13.84	20.21	20.66
15	Non-metallic mineral products	2.87	3.98	5.99
16	Organic chemicals	8.75	4.96	5.02
17	Other chemicals	61.98	44.48	44.13
18	Other textiles	1.82	3.77	3.83
19	Paints and varnishes	17.44	23.21	22.79
20	Pesticides	37.04	31.76	46.99
21	Petroleum products	0.54	1.09	0.78
22	Plastic products	5.80	4.00	5.68
23	Polymers	1.33	2.03	6.46
24	Soaps and toileteries	63.38	47.44	38.02
25	Synthetic textile	0.68	2.00	12.80
26	Trading	3.11	3.41	3.08
27	Transport service	0.47	0.93	1.02
28	Tyres and tubes	19.49	9.96	8.61

Source: PROWESS database.

The independent variables that feature on the right hand side of the equation above have been computed using data from the PROWESS database of the CMIE and are defined as follows:
(1) Mark-up: Profit/ (raw material cost+ energy consumption expenditure + wages).[2]
(2) Openness: This is a measure of the relative openness of the firm and is computed as the total trade (exports + imports) as a ratio of sales.
(3) CR4: Is a measure of the concentration of market share with the top four firms and is calculated as $\Sigma^4_{i=1}s_i$, where s_i is the share of sales of the ith firm.
(4) Wage: This is the real wage cost of the firm and equals wage expenditure/CPI for industrial workers.
(5) Foreign: Is the share of foreign company sales in an industry. A foreign company is defined as one with 10 per cent or more of foreign owned equity.
(6) Ind dummy: This is the industry specific dummy variable.
(7) Time dummy.

The signs expected for the first four explanatory variables are given in parenthesis above, if we accept the hypotheses that greater external openness and freer domestic entry promotes competitiveness in the sense of lowering the mark-up. We conducted the analysis in a panel regression for the period 1989-2001 using balanced panels. For our final results, we dropped observations with extreme values (=0) for openness and foreign and excluded those industries with number of firms less than 10, leaving us with 18 industries.[3] The actual results are given in Table 7 for a panel regression with fixed and random effects. The industry dummies were highly collinear (for intercept dummies) with CR4 reflecting industry specific differences. Hence, we ran the final regression only with CR4. We also ran multiplicative dummies for CR4 and openness (results not given here). All multiplicative dummies were significant. However, the impact of CR4 and openness on mark-up remained the same as in the simple regression. The regression also indicated a concave non-linear impact of openness and CR4 on mark-up.

We see that openness raises profitability, a result opposite to that obtained by Krishna and Mitra (1998) in their study using firm level data (CMIE) of four industries over the period 1986-93. We interpret our result as openness capturing efficiency factors rather than competitiveness. In other words, industries that are more open are likely to be more efficient and therefore earn a higher rate of profit. The force of competitiveness is captured in our model by foreign presence in the industry, which has a negative impact on profit mark-up. Finally, our results indicate that highly concentrated industries also have higher mark-ups. However, the causality is not very clear. In other words, it is possible that high mark-up is a consequence of greater efficiency that leads to greater concentration. This issue needs further investigation.

Degree of Monopoly Power

Another measure of departure from competitive behaviour that has been recently applied in econometric modelling is the Lerner index. Since it is difficult to measure marginal cost, which is a component of the Lerner index, Harrison (1994) and Krishna and Mitra (1998) have adopted a production function approach in which labour, material and capital are the three inputs. Assuming that the market is Cournot-oligopolistic, they totally differentiate the production function and use the firms' first order conditions of profit-maximising input choice to arrive at the following equation which can be estimated:

$$dy_{ijt} = \mu_j [\alpha_l d_l + \alpha_m dm]_{ijt} + (\beta_j - 1) dK_{ijt}/K_{ijt} + dA_{jt}/A_{jt} + df_{it}/f_{it}$$

where y, $_l$ and m are the logarithm of the output-capital, labour-capital and material-capital ratios for firm i in industry j and year t, α_l and α_m are shares of labour and material in sales, β is a returns to scale parameter, with $\beta_j = 1$ indicating constant returns to scale, A_{jt} is an industry specific index of Hick-neutral technical progress and f_{it} is a firm-specific parameter which allows for firm-specific differences in technology. μ_j is the j-th industry's product price divided by its marginal cost whose relation with the Lerner index is obvious. In implementing this model for the Indian case we have generated $z \equiv [\alpha_l dl + \alpha_l dm]$ and $dk \equiv dK/K$ and regressed dy on z and dk. The model was run for 24 industries for the period 1995-2001.[4]

The following variables were generated from PROWESS data base.
(1) Share of labour: Wages/sales
(2) Share of materials: (Total raw material expenses+energy expenses)/sales
(3) Material cost: Total raw material expenses + energy expenses
(4) Capital: $K_0 + I_t$, K_0 is the benchmark year capital stock, which is in our case is 1989. $I_t = GFA_t - GFA_{t-1}$, where GFA is gross fixed assets. To get the replacement cost of plant and machinery GFA of the company has been multiplied by a number which is (a) 3 if incorporation year is 1965 or earlier, (b) 2 if incorporation year is later that 1965 but earlier than 1980 and (c) 1.5 if incorporation year is later than 1980. The investment figures used in the capital stock estimation have been deflated by Machine Tools Price Index with base = 1981-82.
(5) Sales: Sales in Rs crore, to get sale in real terms we have deflated sales figures by wholesale price index. This has been used as a proxy for output.
(6) Labour: No data are available in PROWESS for employment, though latest figures have just started coming in for some companies. So we had to do a mapping with the Annual Survey of Industries (ASI) data for generating employment figures. This required three steps: (i) data on total emoluments and total employment were taken from ASI for various 3-digit industries. Using these data, emoluments per employee was computed. (ii) Considering the nature of the industry, the firms in the sample were matched with the 3-digit industrial classification of ASI and (iii) for each firm, the series on salaries and wages obtained from PROWESS was divided by the computed series on emoluments per employee for the 3-digit ASI industry, yielding an estimate of labour employment in the firm. The results of the estimation are given in Table 8.

Table 7: Result of Panel Regression

	Dependent Variable	Independent Variable	Coefficient
Random effect model	Mark-up	Openness	0.17
		Real wage cost	−0.08
		CR4	0.005
		Foreign share	−0.42
		Constant	−0.037
		N = 5788	
		Wald-chi square=30	

NB: All the variables are significant at less than 5 per cent level, except the bold ones. Hausman specification test rejects the fixed effect.

For almost all industries the coefficient of z is greater than one and significant, indicating prevalence of monopoly elements in the industries. On the other hand, the estimates of the coefficient of dk clearly show absence of scale economy. The price-marginal cost divergence is quite substantial in most industries and this divergence cannot be justified by existence of internal economies of scale.

An issue of equal interest is the question of what happened to our price-cost mark-up (z) over time? Ideally, one would like to compare the period after reforms in 1991 to that before. Unfortunately, for our database, no data is available prior to 1989. What we however try to see is whether the coefficient has declined over the 10-year period after the reforms of 1991. In line with this, we divide our reference period into the period before and after 1995. If reforms have deepened competition, we should find that the coefficient z is significantly lower in the second period. To test this hypothesis we used a multiplicative dummy in Model 2 of Table 8. The regression was run separately for each of the industries shown in Table 8. To avoid clutter we summarise the results of our regressions in Table 9, indicating whether there is a statistically significant difference in the value of z before and after 1995 and whether the z in the latter period is higher or lower.

Table 8. Coefficient of Regression Model 2 Estimation

Sector	z	Dk
Auto ancillary	1.348	−0.001
Automobile	1.299	−0.062
Beverages and tobacco	1.028	**−0.339**
Cotton textiles	1.136	0
Drugs and pharmaceuticals	1.564	**−0.035**
Electrical machinary	1.315	−0.005
Electronics	1.176	0.004
Fertilisers	0.991	**−0.093**
Food products	1.054	0
Inorganic chemicals	1.111	**−0.075**
Metals and metal product	1.088	−0.008
Non-electrical machinary	1.131	−0.005
Non-metallic minerals	1.55	0.006
Organic chemicals	1.126	−0.025
Other chemicals	1.103	**−0.193**
Other textiles	**0.005**	−0.068
Petroleum products	1.197	0.001
Plastic products	1.689	0.004
Polymers	1.396	−0.016
Soaps and toiletries	1.216	**−0.173**
Synthetic textiles	0.704	−0.043
Trading	1.572	0.001
Transport service	1.559	**−0.334**
Tyres and rubbers	1.312	−0.015

Notes: In case of coefficient of z, the price-cost margin, it is not significant for other textiles and significant at 1 per cent level for all other sectors. In case of returns to scale it is significant for seven sectors (bold dk) and insignificant in all other sectors. The regression was run as a pooled cross-section time series panel regression for the period 1989–2001. The coefficients are the averages for the period.

Table 9: Changes in Lerner Index, 1989–2001

Sectors	Z2−Z1	Significance Level
Auto ancillary	+ ve	*
Automobile	No difference	
Beverages and tobacco	+ ve	*
Cotton textiles	No difference	
Drugs and pharmaceuticals	+ ve	*
Electrical machinery	No difference	
Electronics	−ve	*
Fertilisers	−ve	*
Food products	−ve	*
Inorganic chemicals	No difference	
Metals and metal product	−ve	*
Non-electrical machinery	No difference	
Non-metallic minerals	−ve	*
Organic chemicals	+ ve	*
Other chemicals	−ve	*
Other textiles	−ve	*
Petroleum products	+ ve	*
Plastic products	+ ve	*
Polymers	+ ve	*
Soaps and toiletries	No difference	
Synthetic textiles	−ve	*
Trading	−ve	*
Transport services	No difference	
Tyres and rubbers	−ve	*

NB: Z2 is the index for the period 1996–2001 and Z1 for 1989–1995. A positive value in column two indicates that the index is higher in the second period. The star (*) indicates statistically significant difference at 5 per cent level.

An examination of Table 9 indicates that in 14 of the 24 industries the price-cost mark-up has either increased or not changed by the end of the decade. Of the remaining 10, two are residual categories (other textiles and other chemicals) and one is a service sector (trading). The remaining seven manufacturing sectors where the Lerner price-cost margin has declined are electronics, fertilisers, food products, metal and metal products, non-metallic minerals, tyres and rubber, and synthetic textiles. Since the second period (1996-2001) was also a period of slower growth for the economy as a whole it would be useful to see if the decline in margins is due to increased competition or due to the slow down of the economy. In any case, one cannot hold any presumption that the price-cost margins have seen a general decline with the opening up of the economy. Clearly, sector specific competition issues need to be highlighted.

V
Conclusion

Our study of the policy changes after 1991 indicates that both domestic and trade policies were changed significantly to promote competition in the manufacturing sector. We then used some simple econometric models to see the impact of greater competition on profit mark-up over the last decade. The econometric analysis of the factors determining mark-up indicates that, contrary to received wisdom, one measure of market competition, trade openness, by itself does not act to reduce profit mark-up. This may, however, reflect the fact that the exporting firms being more efficient are able to sustain larger mark-ups. In other words, the degree of efficiency is itself the entry barrier. Moreover, if anything, it is the presence of foreign firms in an industry that acts in a competitive way to reduce mark-ups. We also looked at the degree of competitiveness defined as the Lerner price-cost margin. Our analysis indicates that the estimated margins are in general high over the 1990s across all industries. In addition, the standard entry barriers like returns to scale do not seem to be operative. Finally, while in the majority of sectors this margin has not changed over the decade, there seems to be some evidence of decline in the margin for a sub-set of sectors, indicating that sector specific competition issues need to be examined.

Our analysis thus indicates that the market by itself does not bring about competitive outcomes, probably because of the unequal strengths of the market players. This indicates that the regulatory agencies probably have a crucial role to ensure a level playing field. EPW

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Notes

1 PCM (Price-cost Margin)= (V-W)/O, where, V=O-M. V is value added, O is output and M is material inputs, excluding capital charges and W is wages. All variables are measured in current prices.

2 In the literature surveyed above, the mark-up has been variously defined as profit mark-up or price mark-up. The latter is defined as the Lerner index, which equals (price-marginal cost)/marginal cost. While it is obvious that both the measures are positively related we have used the former measure as it amenable to calculation given our database. Under the assumption of constant returns to scale the Lerner index is the same as the profit mark-up.

3 The 24 industries that were included for this study are: Auto ancillary, automobile, beverages and tobacco, cotton textiles, drugs and pharmaceuticals, dyes, electrical machinary, electronics, fertilisers, food products, inorganic chemicals, non-electrical machinery, organic chemicals, other chemicals, other textiles, paints and varnishes, pesticides, petroleum products, plastics, polymers, soaps and toileteries, synthetic textiles and transport services. Of these six industries were excluded because of zero observation on the dependent variables and/or because the number of firms in the industry were less than 10. The industries excluded are organic chemicals, polymers, dyes, paints, pesticides and inorganic chemical s leaving us with 18 industries.

4 The industries that were included in this model are: Auto ancillary, automobile, beverages and tobacco, cotton textiles, drugs and pharmaceuticals, electrical machinary, electronics, fertilisers, food products, inorganic chemicals, metals and metal product, non-electrical machinary, non-metallic minerals, organic chemicals, other chemicals, other textiles, petroleum products, plastic products, polymers, soaps and toiletries, synthetic textiles, trading, transport service and tyres and rubbers.

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