"The Rise of Market Power and the Macroeconomic Implications"

Presenter: Jan Eeckhout Universitat Pompeau Fabra Barcelona

Discussion by Kevin J. Fox (UNSW Sydney)

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Macroeconomists have traditionally had little interest in market power. This is perhaps because the aggregate effects of market power were seen to be small; Harberger (1954) found that the deadweight loss due to market power was "no more than a thirteenth of a percent of the national income".

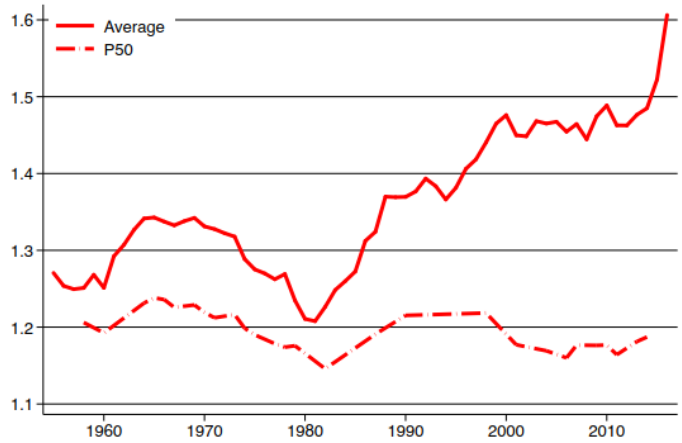
This indifference has changed recently, with interest fueled by the increasing availability of firm-level data sets, falling labour shares and the rapid emergence of new large firms (particularly in the tech industry) which seem to have market power verging on monopoly.

Key players in this burst of research interest in market power and the macroeconomic implications include prominently Professor Eeckhout and his collaborators. The estimates they have found for markups are quite stunning, and have literally been making headlines around the world.

What's the Fuss About?

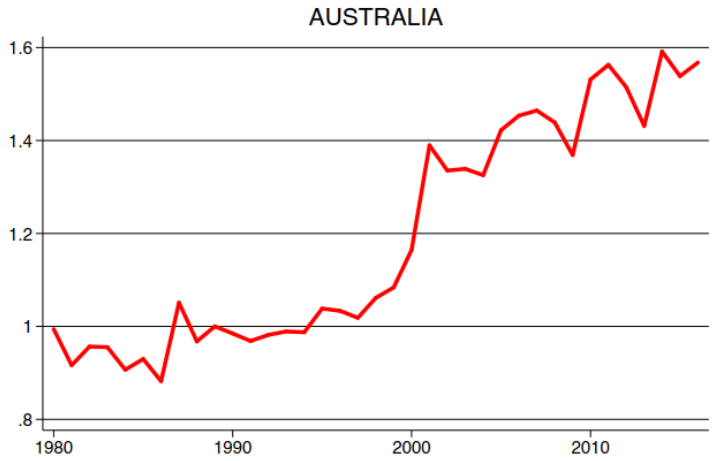
The following figure (taken from Eeckhout 2019) shows one of the more well-known results, that average markups for US publicly listed firms have increased by 40 points, from 1.21 in 1980 to 1.61 in 2016, while median markups have remained quite constant. The most cited number in the recent literature and the media seems to be 1.6, with accompanying calls for urgent action to improve competition policy to remove the market power which has allowed markups to increase to such a level.

Figure 1, De Loecker, Eeckhout, and Unger (2018)



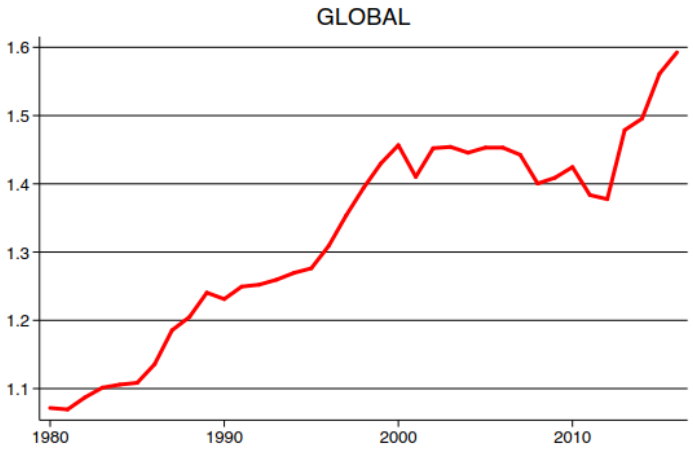
The results by De Loecker and Eeckhout (2018a) for Australia are similarly striking, as illustrated in the next figure (taken from Eeckhout 2019), with an average markup of 1 in 1980 rising to nearly 1.6 in 2016.

Figure A.2, De Loecker and Eeckhout (2018a)



The global picture also reveals a similarly stunning increase in markups, as below (taken from Eeckhout 2019):

Figure 1, De Loecker and Eeckhout (2018a)



So, what to make of this? The literature has focused on issues around data and methodology in examining whether or not such findings are robust. Some observations on this will be given later. For the meantime, two issues are highlighted, as follows:

1. For the U.S. there is a rapid increase in the average markup in the last two years; see the first figure above. This increase seems highly unlikely. Also, if competition policy is failing, as is argued, then how did it fail so spectacularly in such a short time frame, whereas it seemed to be successful in holding markups approximately constant at below 1.5 for more than ten years prior the last two years.
2. The huge spike upwards in the estimated average markup had a different timing in Australia, occurring in 2000 and 2001. A 10% Goods & Services Tax (GST) was introduced from 1 July 2000, which seems a likely contributor to this increase. That is, perhaps the data have not been adjusted for sales tax, instead interpreting the collection of this tax by firms as contributing to their markups of revenues over costs. The two-stage increase of the average

markup across 2000 and 2001 further suggests this is the case; the authors seem to use calendar years meaning that approximately only half of the impact of the 10% GST would be expected to be seen in 2000 given the introduction on 1 July.

A (Very) Brief History of Markup Estimates

There was a previous surge in interest in markups following the seminal work of Hall (1988, 1990) on their estimation using U.S. industry level data. This research drew many strong reactions and commentary, such as the following:

- Nordhaus (1990, p. 151): ‘‘The results are an embarrassment to the theory, with scale factors of 33 in food products and 138 in chemicals. The results are completely inconsistent with engineering production function,…, and common sense.’’
- Baily (1990, p. 147): ‘‘[a]nother important innovation of this research program has been the introduction of some rather whacky variables as instruments . . . . In general, it is problematic to insert instrumental variables without a model to guide how to interpret what is found’’

Hall’s results also spurred on a lot of “stress testing” of his work. This included examining alternative instruments (e.g. Burnside 1996). It was also noted that Hall econometrically estimated a parameter and then inverted it to get his markup parameter, which is not the same as estimating it directly (Bartelsman 1995).

Results for different industries and countries, using different methodologies and both value added and gross output definitions of output, provided a range of markup estimates for consideration and debate. Many of these markups were found to be quite high:

- Morrison (1992) found almost 1.3 for U.S. manufacturing and over 1.4 for Japanese manufacturing.
- Basu and Fernald (1997) found markups of up to 1.72 in U.S. “Manufacturing Durables” and “Private Economy”.
- Diewert and Fox (2008) similar found high markups for some industries, as illustrated in the following figure.

Selected Markups for U.S. Manufacturing Industries, Diewert and Fox (2008)

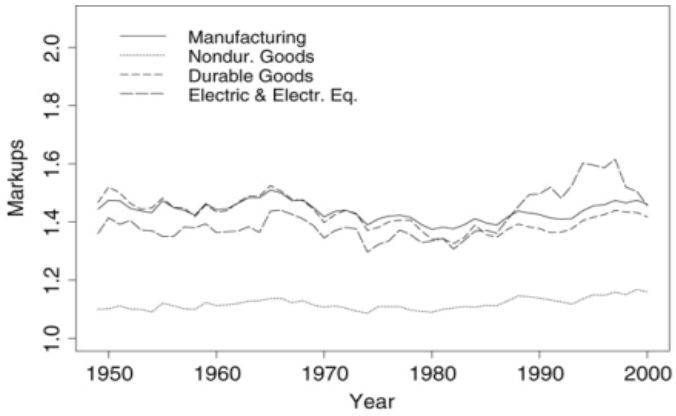


Fig. 2. Selected markups.

The above figure from Diewert and Fox (2008) illustrates a common feature across this older literature; markup estimates were high but they did not have large increases over time, and did not have huge upward spikes as are found in the results of Eeckhout and colleagues.

Stress Testing is Ongoing

As happened following the results of Hall (1988, 1990), stress testing has followed the recent finding of rapidly increasing markups. It seems that other authors are able to find alternative estimates that do not exhibit large increases in markups.

Issues raised in the literature include the following:

1. The firm accounting data used are not constructed for measuring economic markups.
2. The classification of variable costs can be important; should it be just Cost of Goods Sold (COGS) (as used by Eeckhout and co-authors) or also include Selling, General and Administrative Expenses (SG&A) (as suggested by Traina 2018)? Complicating matters, classifications for these different concepts may differ across industries (Syverson 2019).
3. Intangible capital should be (fully) accounted for but is typically not.
4. The calculation of user cost can be done under different assumptions.

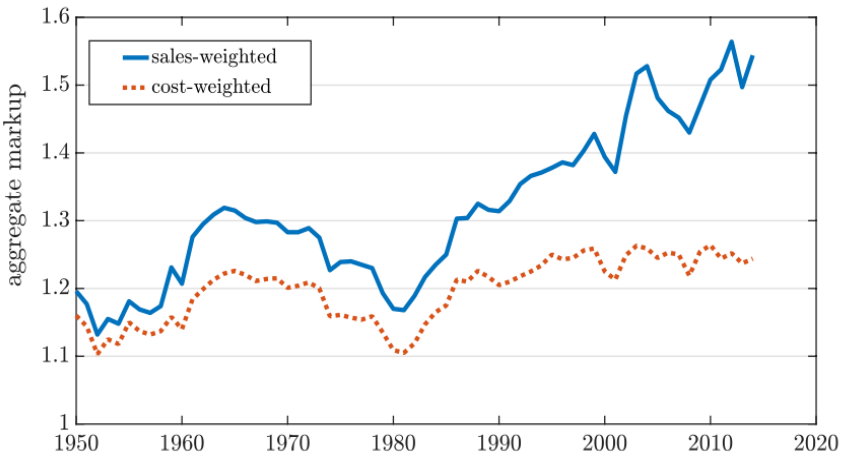
Commentary on such issues can be found in excellent reviews by Basu (2019) and Syverson (2019). Some responses to issues raised are provided by "Some Thoughts on the Debate about (Aggregate) Markup Measurement" by De Loecker and Eeckhout (2018b).

In the following two sections I will add another two items to the list, the first of which has already been noted in the literature, the second of which I believe is new.

Aggregation

Edmond, Midrigan and Xu (2019) have noted that cost-weighting is more reasonable and leads to average markups which do not increase like those calculated using the sales-weighted methodology of Eeckhout and co-authors; see figure 8 from Edmond, Midrigan and Xu (2019) which is reproduced below:

Figure 8: Cost-Weighted vs. Sales-Weighted Average Markups, Compustat



Solid blue line shows the sales-weighted average of firm-level markups in Compustat data, as in De Loecker and Eeckhout (2017). Dashed red line shows the cost-weighted average of firm-level markups. The former has increased by a larger amount, but the latter is the relevant measure of the aggregate distortion to first-order conditions that results in welfare losses.

It is hard to see why sales share weighting would be chosen for aggregation in this context. The arguments put forward by De Loecker and Eeckhout (2018b) appeal to the fact that the Consumer Price Index (CPI) uses sales shares. It is hard to see the connection between the context of a measure of consumer price inflation and firm markups. Specifically, the weights used for CPI construction are natural for the context, but that is not the case for markups.

A markup, μ_n for firm n, with output price vector p_n and corresponding output quantity vector y_n, and input price vector w_n and input quantity vector x_n, can be written as follows:

$$\mu_n = [p_n \cdot y_n / w_n \cdot x_n]\gamma$$

where γ is a scale factor. Summing over all n=1,…,N firms using cost share weights gives the following:

$$\Sigma\mu_n = \Sigma[w_n \cdot x_n / w \cdot x][p_n \cdot y_n / w_n \cdot x_n]\gamma = [p \cdot y / w \cdot x]\ \gamma$$

Thus, cost share weighting ensures that the definition of a markup is the same at the aggregate level as at the disaggregate level. That is, the aggregate markup is the markup of the aggregate. This seems a simple requirement. Without this, any weighting, and hence any result, becomes admissible.

It seems unambiguous, therefore, that cost share weighting should be used to get the aggregate markup. The available evidence (from Edmond, Midrigan and Xu 2019) suggests that doing so results in markups which in fact have not increased dramatically over time.

Downward Bias in the "Within" Term of the Markup Decomposition

De Loecker, Eeckhout and Unger (2018) use a decomposition of markup growth to look at within, reallocation and net entry effects. That is, the extent to which markups are changing due to the

markups of firms' growth, versus reallocation towards firms with higher markups, versus the replacement of firms with lower markups by firms with higher markups. They find that the role of the within term has been falling while the role of reallocation has been large, as in the following figure (taken from Eeckhout 2019):

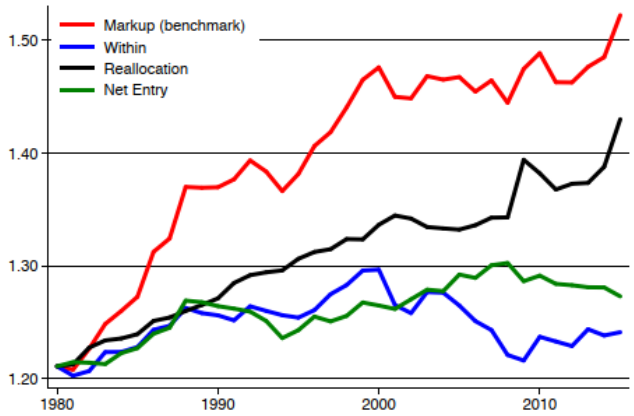


Figure 10: Decomposition of markup growth at the firm level.

The decomposition they use has a within term which is not invariant to the treatment of time and this is likely to create a downward bias, leading to an overstatement of the contribution of reallocation.

The issue can be illustrated as follows. Their within term is $m_0(\mu_1-\mu_0)$, where μ_t is the period t markup, t=0,1, and m_0 is the period 0 weight. Consider a reversal of time, or $\mu_2 = \mu_0$. Then the within term is $m_1(\mu_0-\mu_1)$. In general, this will not be the negative of $m_0(\mu_1-\mu_0)$. This is because of the different weighting of the changes $(\mu_1-\mu_0)$ and $(\mu_0-\mu_1)$; m_0 is the weight for the first change while m_1 is the weight for the second change.

With growing sales of firms with increasing markups, this implies a downward bias in the within term, as in this case $-m_1(\mu_0-\mu_1) = m_1(\mu_1-\mu_0) > m_0(\mu_1-\mu_0)$.

A Bennet-indicator style of within term, $0.5(m_1+m_0)(\mu_1-\mu_0)$, will not have this bias. The reallocation term would then need to be redefined as well; see Diewert and Fox (2010, equation 31) for more on decompositions of this type.

Overall

Professor Eeckhout (and his collaborators) have been central to pioneering a re-invigorated literature on market power. This macro market power literature has examined and revealed much about:

- labour's declining share of income,
- increasing corporate profits,
- increasing margins,
- increasing competition,
- slower productivity growth,
- decreasing firm entry and dynamism

- and reduced investment rates.

This is all extremely valuable. However, it would be inappropriate to conclude that the literature has reached a conclusion on the role of market power in driving the observed trends. More evidence is needed, methodological improvements are required, data issues need to be more satisfactorily addressed and gaps need to be filled.

Hence, while there are many who are claiming otherwise, my view is that there is not enough conclusive evidence to support radical changes in competition policy. There still seems to be too much hard and fast uphill "pedalling" to defend markup estimates, that become much more reasonable with e.g. an entirely reasonable change in weighting in aggregation.

References

Baily, M.N. (1990), "Comments: Competition, increasing returns, and the Solow productivity paradox," in Diamond, P. (Ed.), *Growth, Productivity, Employment*. MIT Press, Cambridge MA.

Basu, S. (2019), "Are Price-Cost Markups Rising in the United States? A Discussion of the Evidence," *Journal of Economic Perspectives* 33, 3-22.

Bartelsman, E.J (1995), "Of empty boxes: Returns to scale revisited," *Economics Letters* 49, 59–67.

Basu, S. and J.G. Fernald (1997), "Returns to scale in US production: Estimates and implications," *Journal of Political Economy* 105, 249–283.

Burnside, C. (1996), "Production function regressions, returns to scale, and externalities" *Journal of Monetary Economics* 37, 177–201.

De Loecker, J., J. Eeckhout and G. Unger (2018), "The Rise of Market Power and the Macroeconomic Implications" NBER Working Paper No. 23687

De Loecker, J. and J. Eeckhout (2018a): "Global Market Power," Discussion paper, NBER.

De Loecker, J. and J. Eeckhout (2018b), "Some Thoughts on the Debate about (Aggregate) Markup Measurement,"manuscript.

Diewert, W.E. and K.J. Fox (2008), "On the Estimation of Returns to Scale, Technical Progress and Monopolistic Markups," *Journal of Econometrics* 145, 174–193

Diewert, W.E. and K.J. Fox (2010), "On Measuring the Contribution of Entering and Exiting Firms to Aggregate Productivity Growth," in W.E. Diewert, B.M. Balk, D. Fixler, K.J. Fox and A. Nakamura (eds.), Price and Productivity Measurement - Volume 6: Index Number Theory, Trafford Publishing, Victoria, Canada, with W.E. Diewert, 2010, 41–66. Also available at www.indexmeasures.com.

Edmond, C., V. Midrigan and D.Y. Xu. (2018), “How Costly Are Markups?” NBER Working Paper No. 24800.

Eeckhout, J. (2019), “The Rise of Market Power and the Macroeconomic Implications,” presentation to the Reserve Bank of Australia conference on Low Wage Growth, 4-5 April.

Hall, R.E. (1988), The relationship between price and marginal cost in US industry,”*Journal of Political Economy* 96, 921–947.

Hall, R.E. (1990), “Invariance properties of Solow’s productivity residual,” in Diamond, P. (ed.), *Growth, Productivity, Employment* MIT Press, Cambridge MA.

Harberger, A.C. (1954), “Monopoly and Resource Allocation,” *American Economic Review Papers and Proceedings*, 44(2): 77-87.

Morrison, C.J. (1992), “Unraveling the productivity growth slowdown in the United States, Canada and Japan: The effects of subequilibrium, scale economies and markups,” *Review of Economics and Statistics* LXXIV, 381–393.

Nordhaus, W.D. (1990), “Comments: Investment, market power, and productivity growth,” in Diamond, P. (ed.), *Growth, Productivity, Employment*. MIT Press, Cambridge MA.

Syverson, C. (2019), “Macroeconomics and Market Power: Context, Implications, and Open Questions,” *Journal of Economic Perspectives* 33, 23-43.

Traina, J. (2018), “Is Aggregate Market Power Increasing? Production Trends Using Financial Statements,” New Working Paper Series No. 17, Stigler Centre, University of Chicago Booth School of Business.