

**Markups: FTC Panel.
November 2018, Washington DC.**

Ariel Pakes
(Harvard University and the NBER.)

General.

There are at least two different issues.

1. How should we measure markups? This is what I will talk about.
2. What determines markups? When investigating whether markups are "too high" in a particular sector, or general trends in markups over time, this is the important question.

Three possibilities for measuring markups.

1. Demand system based methods They work well, particularly in the cross section.

The Wollman example

- Take the predicted markup down from an estimate of the demand system
- Project it down onto exogenous factors (instruments)
- Regress price against product characteristics, wages, and the projection of markups on exogenous characteristics.
- Look at coefficient of markup (should be one), and the R^2 characteristics.

Table 1: Wollman & Pricing Equilibrium.

Taken from Pakes, 2017, *Journal of Industrial Economics*.

	Price	(S.E.)	Price	(S.E.)
Gross Weight	.36	(0.01)	.36	(.003)
Cab-over	.13	(0.01)	.13	(0.01)
Compact front long cab	-.19	(0.04)	0.21	(0.03)
Wage	.08	(.003)	0.08	(.003)
\widehat{Markup}	.92	(0.31)	1.12	(0.22)
Time dummies?	No	n.r.	Yes	n.r.
R ²	0.86	n.r.	0.94	n.r.

Note. There are 1,777 observations; 16 firms over the period 1992-2012. S.E.=Standard error.

- Changes in price of a given good over time. Characteristics of product do not change, so this isolates the effect of competing goods. $R^2 \approx 50 - 60\%$, still impressive for a behavioral model.

Two factors which help

- We typically have fairly good data on prices, characteristics, and quantities
- We don't need either a cost function or the (i) input data, (ii) output data or (iii) the techniques needed to estimate a production function. All three of these can be problematic.

Moreover, the intuition behind the markups holds usually holds regardless of the nature of the pricing games.

- Markups smaller for products in a crowded part of product space.
- Markups are higher for higher quality (and higher priced) products (justifies the investment in them).
- Markups for products that are marketed by a firm with many competing products are higher.

On the other hand demand based method require

- a fairly detailed data set, and
- a lot of time to do the analysis.

Implications

- Not feasible to use them to study markups across all industries (too labor and data intensive).
- Suggestion: To make it feasible to use these techniques in merger studies start a library of data sets.

2. Production Function based methods (De Loecker and co-authors).

Background.

- This literature starts with productivity analysis.
- An honest, yet stark, interpretation of that literature was that we were: regressing sales, on aggregates of various inputs (or their costs).
- We defined "Productivity" as the ratio of sales to an index of these inputs.
- the index usually (but not always) built from a model for sales as a function of either a (i) measure of the expenditure on

inputs or (ii) a rough aggregate of quantities (labor hours of different types of employees)

To move from this definition of productivity to markups from production type data we need to:

- separate prices from quantities of output (having sales will not do).
- an elasticity of output with respect to a variable input.

How do we get these?

- Estimate a production function (with Hicks neutral technological change).

- Assume there is an input which is purchased in a competitive market and optimized out in the short run (conditional on quantity and the other inputs).

What problems arise?

- There does not exist a production function for multi-product firms (at best a correspondence).
- We could try and estimate a production possibility frontier but nobody has provided the techniques to do so in an internally consistent way.
- One alternative that has been used is to go to single product firms. This generates a selection problem (presumably there is some reason for firms becoming multi-product).
- A second alternative that has been used is to use plant level data, but

- Plants are also often multiproduct, and
 - plant level production functions are not what the firm is optimizing over in choosing the variable input.
-
- Aggregates of labor, capital, and materials must exist, and be measured correctly. How do you aggregate capital of different vintages and different types, labor with different education and experience, ...
 - Technological change must be Hicks neutral (at least in the way it has been done).
 - Finally we need an estimation algorithm that corrects for endogeneity and selection. This exists, but selection is often ignored, and it and entry are the mechanisms which are supposed to mitigate abnormal markups.

Advantage of using production function techniques to get at markups (and it is a big one)

- If we ignore the problems noted above, and have the type of data available at the Census, it can often be done relatively quickly on a large number of different industries. De Loecker and co-authors have also used Computstat data.

3. Obtaining Margin Data Directly From Firms.

I have less experience with this, though there are some obvious issues.

The first issue is what would we like them to include in the margin.

Even for merger analysis the question can be problematic as there are different reasons for wanting the merger data and they probably go along with different "margins" that we would like to measure.

1. We want marginal costs for analysis of the price effects of a merger assuming no cost synergies. Problems include
 - inputs which contribute to marginal costs over periods need depreciation rates (e.g.

marketing might be included but only partially allocated to current year costs),

- what is reasonable may depend on how large a quantity change is likely as a result of a merger.

2. We want more than that for evaluating potential synergies

- The argument for synergies is often related to fixed costs (central offices, advertising, R&D facilities,...)
- "Cost synergies" might have an effect on consumer welfare. For e.g. in a bank merger would we want to include the closing of branches when we thought it would happen (and it happens a lot)?

Moreover given what we ask for there is a question of what the firms have an incentive to provide (Laffont-Tirole).

- This is mitigated if you can find estimates of margins that were constructed before the event you are investigating was an issue.