Comments on *Econometrica*'s Walras-Bowley lecture: Azar, J. and X. Vives "General Equilibrium Oligopoly and Ownership Structure"

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This lecture addresses an important open question in economics. What are the equilibrium effects of market power, in particular on the labor market? The focus of interest is on the role of common ownership. When investors hold shares in companies that compete against each other, the shareholders' objective takes the air of collusion. For example, in a market with two competitors, when the same investor owns both companies, the two firms will behave as if they are perfectly colluding, i.e., the two firms behave as if they were one monopolist. Such common ownership is prevalent and on the rise, as research on the airline industry by Azar, Schmalz, and Tecu (2018) documents, and is a prominent candidate explaining the rise of market power since the 1980s.

This lecture offers a theoretical view of the impact of the ownership structure on market power and the implications this has on the labor market. It builds on and reviews the authors' extensive work on common ownership, which all starts with the remarkable result by Azar (2011) and the so-called "Common Ownership Trilemma". He shows that is impossible to simultaneously achieve 1. portfolio diversification; 2. shareholder representation; and 3. goods market competition. As investors have veered towards diverse portfolios, the common ownership by the large funds that manage those portfolios has been detrimental to competition. In this lecture, the authors further formalize some of these ideas.

This paper introduces common ownership through the direct dependence of the objective of the firm on the profits of other firms. This reflects the fact that the diversified portfolio of the owners includes direct competitors. This idea was originally introduced as the "sympathy effect" by Edgeworth (1881), and that several papers have formalized (see amongst others Rubinstein and Yaari (1983), Rotemberg (1984), and Bresnahan and Salop (1986)). This objective function, given diversification, boils down to a form of collusion. Because of common ownership – shareholders own part of the firms they compete against – the firm owners behave as colluding entities. The paper does a wonderful job formally establishing the relationship between common ownership in an isolated market and the effect on efficiency and the distribution of rents.

The rise in common ownership leads to a rise in market power and has a similar effect as a reduction in the number of competitors, or an increase in the number of goods produced by a multi-product firm. Despite the focus on common ownership, the difficulty of modeling common ownership implies the setup necessarily remains somewhat rudimentary. For efficiency, the exact ownership structure matters a lot, in particular, how ownership is concentrated. The authors take a very stylized approach by assuming that all owners are identical, and that no worker owns any shares in a firms. As in the case of the urban economics literature with homeownership, the shareholders here are akin to "absentee landlords." It is well known that what matters crucially for welfare and policy is how concentrated ownership is. These assumptions do not leave a lot of room for manoeuvre in analyzing variation in the concentration of ownership in more or fewer hands, with or without common ownership. Most importantly, because no workers own any shares, there are no worker-owners who would take into account the labor market implications of market power. These

simplifying assumptions are of course a response to well-known technical difficulty, and I voice this therefore not as a critique of the current paper in particular, but rather as a challenge to the broader literature to investigate a more detailed ownership distribution.

An interesting open question is how the decision making occurs at those firms and how the political economy of corporate governance works. In the current model, the firm is run by a dictator who is benevolent towards each of the shareholders in proportion to their holdings. The decision making problem is left out of the picture here and would likely suffer from Arrow's Impossibility Theorem and The Condorcet paradox. Moreover, one would expect that there is an agency problem between the executives and the shareholders, or more important, between the majority shareholders and the minority shareholders. This is of course a critique that applies to any model with multiple owners of firms. But it is particularly acute here because owners hold portfolios of different entities, with decision making *across* firms not just within the firm, which makes the problem considerably more complex.

The big question – in policy and in the academic debate – is what the *macroeconomic* general equilibrium effect is of the rise of economy-wide market power. In particular, what is the effect on wages and on the labor market. There are general equilibrium effects of course also beyond wages and labor force participation – for example the decline in labor turnover and migration – and even beyond the labor market, such as the decline in startups, or the reallocation of market share from low markup to high markup firms.[1]

But quite rightly, a major equilibrium implication of market power is the effect it has on wages and labor force participation. Here, the paper does a nice job analytically singling out the effect of common ownership on wages in a small, isolated market. These effects are captured in the notion of a markdown, the extent to which wages fall below marginal product, which is the mirror image of the markup, the extent to which product prices rise above marginal cost. The paper also discusses the effect on the labor share that results.

I would like to make a distinction here between the general equilibrium effect in a small economy and the macroeconomic general equilibrium effect. To start, in a Cournot economy, once we have more than 8 or 10 (identical) firms, the equilibrium is already very close to competitive. Therefore, the general equilibrium considerations in this paper here are about a small, isolated market.

The baseline model is a one-sector model where a small number of firms engage in Cournot competition for goods that are perfect substitutes. This reflects the idea that large firms strategically affect equilibrium prices and quantities, which is exactly what underlies the source of how firms exert market power. But again, this strategic interaction is relevant only for a small number of firms. The key assumptions are that output goods are perfect substitutes, that labor inputs are perfect

[1]The latter leads to the so called superstar effect (Autor, Dorn, Katz, Patterson, and Van Reenen (2017)). For a discussion of the macroeconomic implications of the rise of market power, see De Loecker, Eeckhout, and Unger (2020).

substitutes, and that markets are homogeneous. In the extensions, some of the assumptions are relaxed, and some further insights are obtained.

These assumptions substantially confine the insights we get when we take the limit as the number of competitors becomes large. Under the maintained assumptions, the limit economy is monopolistically competitive in the output market. Hence markups converge to those under monopolistic competition. In addition, because there is perfect mobility of labor, in the limit, the markdown disappears. Firms face a continuum of competitors and workers can costlessly switch between them, which results in workers being paid their marginal product. In recent work, Berger, Herkenhoff, and Mongey (2019) and Deb, Eeckhout, and Warren (2020) show that when there are mobility frictions – labor is not perfectly substitutable – in a world with a continuum of small markets, markdowns do not disappear even if the number of firms tends to infinity.

Therefore, we do not just want to understand the general equilibrium effect in a small, isolated economy, but we also want to analyze the macroeconomic general equilibrium effect in the US economy with 6 million firms. One way to do that is to consider an Atkeson and Burstein (2008) setup with many small Cournot markets where firms interact strategically. In such a setting, the effect of concentration and market power on wages conflates three distinct forces that embody notably different mechanisms.

The first force is the effect of market power on the labor share. This force is at work at the level of an individual firm. A firm that has product market power raises output prices, and by moving up its demand curve, it produces less output. Less output implies the firms hires less labor. This is made explicit in the firm's first order condition: the expenditure on labor as a share of revenue is inversely related to the product market markups. Even if the labor market is perfectly competitive and the firm is small relative to the input economy where the individual firm has no effect on wages, there is an effect on the *quantity* of that individual firm's labor demanded.

The second force is the general equilibrium effect of product market power on wages. If enough of those individual firms exert product market power, the aggregate demand for labor declines. This is an aggregation of the individual firm effect of the first force. Now this aggregate effect – a decline in aggregate labor demand – in turn leads to a decline in equilibrium wages. And depending on the aggregate labor supply elasticity, there is also be an effect on labor force participation. Nonetheless, as is illustrated with perfectly inelastic labor supply, there is always a decline in wages, even if there is no effect on the quantity of labor. If the first force acts exclusively through *quantities* (of labor), the second force acts through *prices* (wages). In the baseline model of the current paper with a small number of identical firms and a single good, there is no general equilibrium effect on wages: the wage effect is exactly offset by the effect of the owners' consumption. This is of course very specific to the setup and highlights the limitations of the one sector, one good economy in a small isolated economy. De Loecker, Eeckhout, and Mongey (2018) quantify this general equilibrium effect of product market power in a large economy, and we find that the general equilibrium effect

on wages is large. For a rise of market power consistent with what we have seen between 1980 and 2016, the wage drops by 14%.

The third force is through monopsony power, and what is usually referred to as the markdown. Even if a firm does not have product market power, when it is larger relative to the (local) labor market where it hires its inputs, it exerts monopsony power. Each firm individually faces an upward sloping labour supply curve. Then, the firm pays lower wages because due to its size relative to the labor market, it can pay wages below the marginal product of the worker, just the same way the firm that exerts product market power sets the price above marginal cost. Key to monopsony power in a large economy is that there are frictions on the mobility of labor, otherwise they could generate counteroffers from firms outside the local labor market. In the current analysis, even though there are no frictions on labor, there is oligopsony power (multiple firms exerting monopsony power) by the firms because the total number of firms is small. The friction that workers face is the inability to work for any other firm than the small number of competitors. Again this is a peculiarity of the small economy analysis, which has limited relevance for the macroeconomy.[2]

Throughout, the paper focusses on the Herfindahl-Hirschman Index (HHI). There is no question about the theoretical link between HHI and concentration in the Cournot model. But it is not practical to use HHI more broadly and in particular when taking these models to the data for two reasons. First, some models other than Cournot (for example Melitz and Ottaviano (2008)) generate the opposite, a *negative* relation between market power and HHI. Second, and more importantly, it is virtually impossible to define the market over which the HHI is measured. The problem is that the choice of the market affects the outcome. This is particularly problematic measuring concentration at the macroeconomic level, across industries and over time. Eeckhout (2020) shows that this can lead to wrong conclusions because population growth mechanically alters HHI. If market power increases and population grows at the same time, then HHI can decline. Population growth is behind the apparent puzzle between the rising concentration at a national level and the declining concentration locally.

Finally, the extension to multiple sectors is going in the right direction to get at the macroeconomic implications of market power. The number of firms economy-wide remains small and the goods within sector are homogenous (in consumption and production). The limit of this economy as the number of sectors goes to infinity is therefore the Dixit-Stiglitz framework. That is a very special case where the efficiency effect of markups on wages is mute. The lack of heterogeneity in production and preferences within a sector (as opposed to Atkeson and Burstein (2008) for example) precludes a role for general equilibrium effects that are relevant from a macroeconomic perspective.

Overall, this lecture offers an excellent analysis of the welfare effects of common ownership. It

[2]Deb, Eeckhout, and Warren (2020) model output market power and monopsony simultaneously in a large economy with a continuum of heterogeneous firms. They find that the majority of the wage effect is driven by output market power, not by monopsony power.

gives both a review of existing results and additional new insights. Though the small economy setup is of limited quantitative relevance for the macroeconomic effects of market power, it does provide valuable insights of the effect of the ownership structure. Common ownership is one of the important drivers of the change in market structure that has led to the rise of market power, in addition to the emergence of multi-product firms, the rise of mergers and acquisitions in combination with lax antitrust enforcement, and of course technological change. Common ownership deserves all the attention it can get to help us further understand changes in market power.

References

Atkeson, A., and A. Burstein (2008): "Pricing-to-Market, Trade Costs, and International Relative Prices," *American Economic Review*, 98(5), 1998–2031.

Autor, D., D. Dorn, L. F. Katz, C. Patterson, and J. Van Reenen (2017): "The Fall of the Labor Share and the Rise of Superstar Firms," Discussion paper, Centre for Economic Performance, LSE.

Azar, J. (2011): "A new look at oligopoly: Implicit collusion through portfolio diversification," *Princeton mimeo*.

Azar, J., M. C. Schmalz, and I. Tecu (2018): "Anticompetitive effects of common ownership," *The Journal of Finance*, 73(4), 1513–1565.

Berger, D., K. Herkenhoff, and S. Mongey (2019): "Labor Market Power," Chicago mimeo.

Bresnahan, T. F., and S. C. Salop (1986): "Quantifying the competitive effects of production joint ventures," *International Journal of Industrial Organization*, 4(2), 155–175.

De Loecker, J., J. Eeckhout, and S. Mongey (2018): "Quantifying Market Power," Mimeo.

De Loecker, J., J. Eeckhout, and G. Unger (2020): "The Rise of Market Power and the Macroeconomic Implications," *Quarterly Journal of Economics*, 135(2), 561–644.

Deb, S., J. Eeckhout, and L. Warren (2020): "Market Power and Monopsony in Macroeconomic Equilibrium," Discussion paper, UPF mimeo.

Edgeworth, F. Y. (1881): *Mathematical psychics: An essay on the application of mathematics to the moral sciences*, vol. 10. Kegan Paul.

Eeckhout, J. (2020): "Comment on: Diverging Trends in National and Local Concentration," in *NBER Macroeconomics Annual 2020, Volume 35*. NBER.

Melitz, M. J., and G. I. Ottaviano (2008): "Market size, trade, and productivity," *The review of economic studies*, 75(1), 295–316.

Rotemberg, J. (1984): "Financial transaction costs and industrial performance," Discussion paper, NBER.

Rubinstein, A., and M. Yaari (1983): "The competitive stock market as cartel maker: Some examples," Discussion paper, STICERD.