Comment

Jan Eeckhout, *UPF Barcelona,* Spain

There is a rapidly growing recent literature that analyzes the rise of market power over the last 4 decades in the United States and in many other economies. The study of market power is, of course, not new and is arguably as old as the study of economics itself.[1] But the renewed interest is its scope, particularly the role for macroeconomics. Much of the recent literature focuses on measuring market power throughout the economy and on its quantitative macroeconomic implications. Many macroeconomic models from monetary economics, over trade and urban economics, to labor have predictions that hinge on the degree of market power that firms have. The monetary transmission mechanism in the New Keynesian models, for example, crucially depends on markups and the extent to which the market power of firms is pervasive throughout the economy. The challenge, therefore, is to find appropriate ways to measure market power for a representative sample of the universe of firms in the economy.

The paper by Esteban Rossi-Hansberg, Pierre Sarte, and Nico Trachter draws attention to an important and hitherto understudied issue in this literature, the dichotomy between national and local measures of concentration. The main idea is that the degree of concentration of firms at the national level is very different than what it is at a local level, be it the state, the metropolitan area, or the ZIP code. They find a baffling fact: all measures of local concentration show a declining trend, whereas measures of national concentration show an increasing trend.

This is an important observation and I sympathize with the premise of investigating market power at different levels of aggregation and for different subeconomies of the macro economy. After all, to understand the macro economy we need to understand the micro origins. The paper

978-0-226-80268-8/2020/2020-0202$10.00

also makes a noteworthy contribution in attempting to rationalize this dichotomy by investigating the role of superstar firms and firms with multiple establishments such as national chains in retail and big box stores. There is no doubt that the technological transformation of distribution and logistics has had a significant impact on concentration. The paper's main conclusion is that large national firms may exhibit market power at the national level, but they do so by inducing competition in local markets. The authors deduce that the increased competition in local markets is the result of more market power nationally. Therefore, the rise of national market power may raise consumer welfare.

Unfortunately, the paper does not fully deliver on this ambitious research agenda. The reason why it fails to do so is of interest to the research community in macroeconomics that focuses the role of market power for the aggregate economy. The approach in this paper is instructive because it highlights the particular challenges that macroeconomic analysis faces once we take the micro origins with due consideration. The reason why the paper fails is because it has overlooked 3 decades of research in industrial organization (IO) that has repeatedly shown the shortcomings of the concentration measures on which the analysis here is based. Following the influential contribution of Bresnahan (1989), the IO literature has moved away from concentration measures toward alternative approaches to measure market power. What this paper highlights is not simply that concentration measures are inadequate tools and that the authors have ignored the insights from the IO literature. This paper shows that in addition to the shortcomings in a traditional IO analysis, the challenges of a macro setting with diverse sectors and long time series completely incapacitate concentration measures as a tool in macro. This paper does provide a clear illustration where concentration measures go wrong.

In the remainder of this short comment I provide some remarks that I hope help guide the discussion for future research. I illustrate the shortcomings of concentration measures when used in macro, I revisit the four main facts of the paper in the light of that discussion, and I propose some alternative methodology to think about market structure in the macro economy.

I. Concentration Measures

Market power is canonically defined as "the ability of a firm to profitably raise the market price of a good or service over marginal cost." This is typically expressed as the markup, the ratio of the price the firm charges

over the marginal cost. As such, it is a statement about the behavior of an individual firm. Of course, what makes the measurement of market power conceptually a challenge is the fact that except in the case of a monopoly, the firm behavior is determined strategically and in equilibrium with the behavior of competitors in the market.

The problem that any researcher on market power faces is how to measure the marginal cost of a firm or of a product. An alternative is to focus on the measurement of profits instead, which includes not just the marginal cost but also overhead and fixed costs. Unfortunately, the fact that accounting profits are typically not equal to economic profits raises an additional hurdle.

Therefore, an alternative route is to obtain indirect measures. To that effect and inspired by the one-to-one relationship between market power of a firm and its market share of revenue in a Cournot (1838) model, concentration measures inform us about the distribution of market power in a well-determined market. The most popular of the concentration measures is the Herfindahl–Hirschman Index (HHI). It is defined as sum of squared market shares s_i of all firms i in a market: $\text{HHI} = \Sigma_i s_i^2 \in [0; 10,000]$. It is typically expressed as a number from 0 to 10,000 where the market share is expressed in percentages. The HHI is effectively a measure of inequality, just like the Gini coefficient or the variance. It turns a complex distribution of market shares with possibly infinite moments into a scalar that has an easy interpretation. Under monopoly (or a dominant firm with the entire market share), the market share is 100, which when squared yields an HHI of 10,000. Under perfect competition with all market shares equal to zero, the HHI is zero. Its simplicity is part of the broad appeal of HHI, as are the readily available measures of revenue to calculate market shares.

There are, however, two long recognized shortcomings. First, the reliance on market shares as a measure of market power is not always suitable. There is indeed a direct positive relationship between markups and market share in the Cournot model, but in many models that relationship is not so direct and the HHI only imprecisely measures markups. What is even worse, however, is that in some models the market share is declining in the markup (e.g., Melitz 2003; Melitz and Ottaviano 2008). A higher HHI, therefore, indicates lower market power, not higher!

Second, the HHI crucially depends on the definition of a market: Who are the competitors? If we wrongly determine the participants in the market, we get an incorrect measure of the HHI and, therefore, an incorrect measure of market power.

Are concentration measures a good tool to measure market power? Policy makers who review mergers at the Federal Trade Commission (FTC)

and the Department of Justice (DoJ) still rely heavily on measures of concentration. The magic number there is 3,000, where merger review is automatically activated when the HHI in a market crosses this 3,000 watermark. It continues to be a transparent measure that is successful in convincing nonspecialized judges who rule over merger cases.

However, following an influential article by Bresnahan (1989), the academic IO literature that studies market power seems to have veered toward a rejection of the HHI. Instead, the literature has opted for a structural approach. The most celebrated is the demand approach pioneered by Berry, Levinsohn, and Pakes (1995), which specifies a model of consumer demand over goods with different degrees of substitutability, of a market structure with well-defined competitors and how they compete (e.g., quantity versus price competition), and with a specified production technology. This approach has been successful in determining market power in markets such as cars, breakfast cereal, cement, beer, and so on. Because this so-called demand method is enormously demanding in terms of data requirements, in recent years the production approach has gained traction, especially because the data requirements are far less stringent, thus lending itself better to the analysis of market power in macroeconomics with broad cross sections and long time series.[2]

Concentration measures in macro. So what are the prospects of concentration measures in macro? There is no doubt that the HHI is easy to calculate, that data on revenue are relatively widely available, and that this permits for data on broad cross sections and long time series. That is exactly what this paper exploits. The Achilles' heel, however, is the market definition. What constitutes a market in the macro sense?

Here, macro faces even taller obstacles than IO. Two sets of reasons for the taller obstacles are reasons based on the cross-sectional comparison and reasons based on intertemporal comparison. The fundamental problem is that the HHI is mechanically related to how a market is defined, typically the intersection of an industry classification and a geographical area. There are some 6 million firms and nearly 7 million establishments in the United States. Each of them belongs to an industry (e.g., Standard Industrial Classification 8 [SIC-8]) and a geographical area (e.g., ZIP code or metropolitan statistical area [MSA]). It is precisely that ad hoc definition that does not correspond well to the true market definition—namely, who competes with whom.

First, consider the cross-sectional comparison. A typical SIC $\times$ Geo definition may be a close enough description of the true market, but it

cannot be for all markets. For example, the ZIP code may be a more or less accurate description of a market for coffee shops or dry cleaners, but it is not for furniture retailers such as IKEA. For those companies, the MSA is the more accurate market definition. And for yet other manufacturers, such as car assembly plants, the adequate market definition is national. The problem is that the HHI is calculated for the same SIC × Geo definition for all firms, say, either ZIP code or MSA. Therefore, either the SIC × Geo definition is not appropriate for furniture or car assembly (when ZIP code, as most car manufacturers in a ZIP code are monopolists and virtually all ZIP codes have zero car manufacturers) or it is not appropriate for coffee shops (when MSA). Inherently in the field of macro, there is never one size that fits all. If the set of sectors was reduced to tailor all industries to the same definition, it would be so product specific that it becomes IO and not macro.

But even at the ZIP code level, the size of the SIC × Geo definition is typically still too large for most products. The DoJ considers there to be a lack of competition starting at an HHI of larger than 3,000 or three similar firms. Having more than 10–15 firms is considered perfect competition in any model of oligopoly for any set of reasonable preferences. Some of these market definitions have more than 10,000 establishments. The national measures have millions. Rather than an HHI of thousands, those definitions whip up HHIs that are in the decimals. This is very far away from the interpretation of what constitutes a market that exhibits limited competition. Using the SIC × Geo definition poses serious difficulties in the cross-sectional measurement of market power in macro, much more so than in IO.[3]

Second, consider the intertemporal comparisons. The ad hoc SIC × Geo definitions of what constitutes a market are an even bigger challenge because those definitions are fixed. In the presence of demographic changes, these fixed definitions induce a mechanical change in concentration measures such as the HHI. As the number of establishments in these SIC × Geo cells change for demographic reasons, so does the HHI.

For the purpose of understanding what drives the results in this paper, I show that four premises that are borne out in the data lead to the dichotomy of diverging concentration measures locally and nationally. The four premises are the following:

1. Population growth: Figure 1*A* shows that the employment population in the United States has grown from around 70 million in the early 1980s to nearly 120 million now.

2. Constant average establishment size (fig. 1*B*): The average size of establishments in the United States is fairly constant at around 17 workers per establishment, hovering between 16 and 18 workers over the same period.

3. The ratio of establishments to firms has increased from 1.22 in 1980 to 1.33 most recently (fig. 1*C*).

4. The industry-location grid (the SIC $\times$ Geo cell definition) is constant.

The insight is that as the population grows for a given location, so does the number of establishments. The firm size is constant, so with a growing employment pool, there must be more establishments in which those employees work. For example, in Manhattan there used to be 4 supermarkets every 10 blocks; now there are 6 every 10 blocks. Before we turn to what this tells us about competition, we look at the effect this has on the HHI. To do so, consider the following stylized example laid out in table 1.

In our stylized economy there are two SIC $\times$ Geo areas, say coffee shops in the Philadelphia and Boston metro areas. All firms are identical and there are 1,000 of them in each area. The local HHI in both areas is

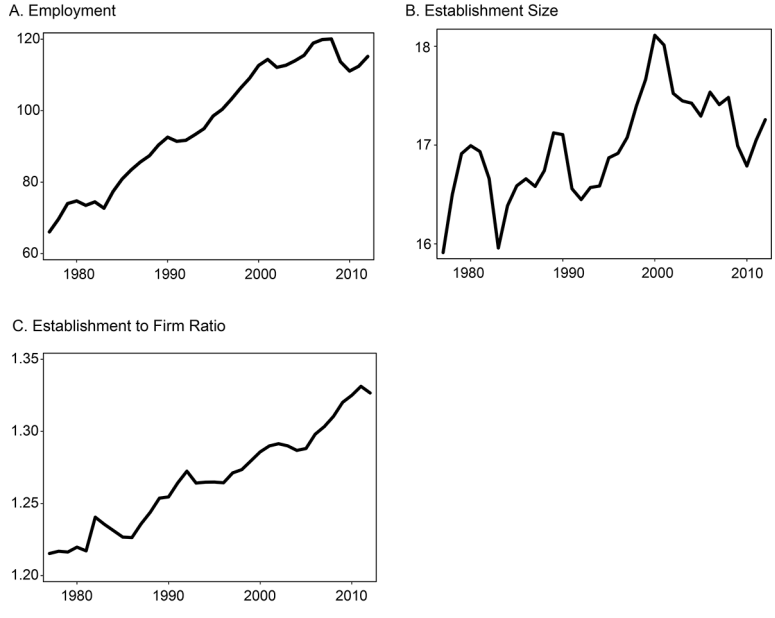

Fig. 1. Demographics of employment, establishments, and firms

Table 1
Stylized Example of the Mechanical Source of the Dichotomy between National and Local Concentration

			Aggregate	
	SIC × Geo 1	SIC × Geo 2	Local	National
	1980			
	Baseline Economy			
	1,000 establishments	1,000 establishments	2,000 establishments	
Local HHI: $HHI_{SIC \times Geo}$	10	10	10	5
	2020			
	Increase Population; Constant Firm Size; Multi-establishment Firms			
	1,500 establishments	1,500 establishments	3,000 establishments	
Local HHI: $HHI_{SIC \times Geo}$	6.7	6.7	6.7	6.7

Note: HHI = Herfindahl–Hirschman Index; SIC = Standard Industrial Classification.

equal to 10. The local market share of each identical firm is 0.1%, squared and times 1,000 gives an HHI of 10. When we take a weighted average over the HHI in both local markets, the aggregate local HHI is 10. Now at the national level, there are 2,000 establishments and suppose for the sake of argument that the establishment to firm ratio is 1. Then the HHI nationwide is 5.

Fast-forward to 2020, and the population has increased by 50%, and the firm size is still constant. Therefore, there are 1,500 establishments in Philadelphia and in Boston, giving an HHI of 6.7, which is also the aggregate of the two identical local HHIs. Now let us assume for the sake of argument that the establishment to firm ratio has gone up to 2. Each firm has two establishments, so there are 1,500 firms in the entire economy. Therefore, even though there are 3,000 establishments, only 1,500 can be considered independent competitors. As a result, the national HHI is equal to 6.7. If all two establishments of the same firm are the two different markets, then the local HHI is also 6.7. The national HHI increases while the local HHI decreases: hence, the dichotomy.

This simple example shows that under the four premises, we obtain the dichotomy for purely mechanical reasons. The mechanism stems from demographic changes on a fixed definition of what constitutes a SIC × Geo unit. This does not tell us anything about what has happened to

competition in the many markets within these units. If competition among coffee shops in each market of the unit goes up and we now have 15 shops competing instead of 10, then the increase in population is competition enhancing. That translates in a decline in markups and of the true HHI. Instead, if the number of competing shops per market goes down from 10 to 5, then we see an increase in market power. In both cases, the HHI goes down locally and up nationally.

The problem that this exercise highlights is that it is extremely difficult, if not impossible, to observe the boundaries of a market. As the number of supermarkets goes from 4 to 6 on 10 blocks in Manhattan, does that mean there is more competition? Maybe. We don't know until we identify who competes with whom or if we measure markups directly. Inferring competition from a geographical definition is tricky because the definition varies with population density. Because it is 50 miles from one Whole Foods to the next in rural New Jersey and only 25 blocks from one to the next in Manhattan does not necessarily mean that the market in Manhattan is more competitive than New Jersey. Firms compete differently in denser areas. In fact, the evidence using markups instead of concentration measures seems to suggest that market power is higher in denser areas (Anderson, Rebelo, and Wong 2018), areas where there are more competitors per block! Therefore, as population grows, the market definition changes. And with higher population density, New Jersey starts to look a bit more like Manhattan did 50 years ago.

I come to two conclusions. First, considering the HHI over time for a fixed grid does not inform us about a change in competition. Second, the dichotomy between national and local HHI is mechanical and does not inform us about whether indeed there is a dichotomy between national and local market power.[4]

Simulation in an Atkeson and Burstein (2008) economy. I now reproduce the same mechanical findings in a more realistic economy simulated under demographics that satisfy the four premises. In our model economy, we obtain the dichotomy in national and local HHI, while market power increases both nationally and locally.

The model is based on De Loecker, Eeckhout, and Mongey (2018) with market power in the output market and where the input market for labor is competitive. There is no free entry. The production function is linear, $Y_{ij} = A_{ij}L_{ij}$, where productivity A_{ij} is drawn from $\log(A_{ij}) \sim \mathcal{N}(\mu, \sigma^2)$. In each market, there are N firms that compete à la Cournot.[5]

Let the number of competitors in 1980 be $N = 10$, so there are 100 markets, 10 in each cell. In 1980, the size of the labor force is normalized to 1. For the 2020 economy, the population increases to 1.5 (premise 1) and the number of establishments grows to 1,500, which keeps the average establishment size constant between 1980 and 2020 (premise 2). In 2020, we consider that there is an increase in market power, where the number of competitors declines to $N = 3$. As a result, there are 500 markets, 50 in each cell. To this setup, we add a distinction between firms and establishments. There are two types of firms; single-establishment (SE) firms and multi-establishment (ME) firms. In an attempt to capture the rise of national chains (and superstar firms), I assume that in 1980 the ME firms each have two establishments, while in 2020 the ME firms each have 10 establishments. We adjust for the number of SE firms F_1 and ME firms F_m to ensure that the establishments-to-firms ratio in the economy r is 1.2 in 1980 and 1.3 in 2020 (premise 3).[6] For simplicity, let each of the establishments belonging to a single ME firm be in different locations; let there be 10 SIC $\times$ Geo cells in 1980, which remain the same in 2020 (premise 4).

Figure 2 and table 2 summarize the results of this thought experiment. In both panels of figure 2, the straight lines simply connect the two observations for the model economies in 1980 and 2020. Both scenarios generate a divergence in the local and national HHIs. This is due to the mechanical increase in the number of establishments in a fixed grid of SIC $\times$ Geo cells. Having more establishments implies a lower local HHI. Still, the national HHI moves in the opposite direction because multiple establishments of the same firm are counted as one firm. Due

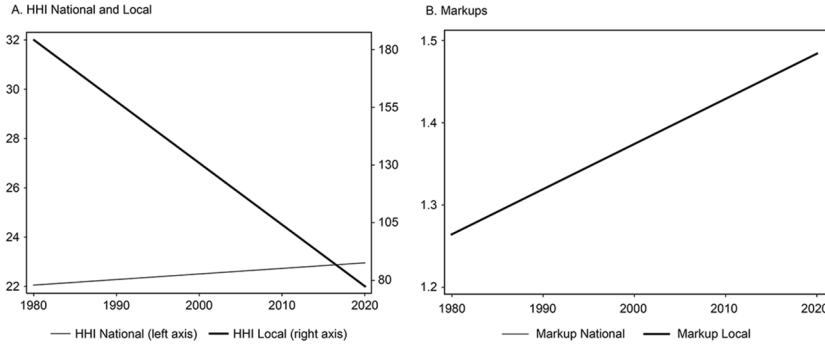

Fig. 2. Herfindahl–Hirschman Index (HHI) and markups in simulated Atkeson and Burstein (2008) economy.

Table 2
HHI for Different Atkeson and Burstein (2008) Economies

	Aggregate HHI		Markup	
	Local	National	Local	National
	1,000 establishments $r = 1.2$			
1980:				
Low Market Power $N = 10$	185	22	1.27	1.27
	1,500 establishments $r = 1.3$			
2020:				
High Market Power $N = 3$	78	23	1.48	1.48

Note: The SIC × Geo grid is fixed at 10 in all economies. HHI = Herfindahl–Hirschman Index; SIC = Standard Industrial Classification.

to the rise of the establishment-to-firm ratio, together with how these establishments are distributed over firms, there is an increase in the national HHI.

Table 2 reports the numerical values for these HHIs and markups. The level of the local HHI is notably larger than the national HHI, simply because locally there are fewer firms. Over time, there is a decline in the local HHI from 185 to 78. The national HHI increases from 22 to 23.

Most striking is that this divergence is completely independent of the change in markups. Aggregate markups increase from 1.27 to 1.48. They are identical for local and aggregate markets. In the Atkeson and Burstein (2008) model of Cournot competition, the markup depends directly on the number of competitors N. And in Cournot, the markup is also related to the HHI, only it is the HHI within a market with $N = 10$ establishments instead of the 1,000 establishments in the SIC × Geo unit. That is for 1980; in 2020, the market consists of $N = 3$ and not the 1,500 establishments in the unit.

II. The Four Facts Revisited

I now briefly revisit the four main facts in the paper by Rossi-Hansberg, Sarte, and Trachter (2021) in the light of the mechanical relation that exists between national and local concentration.

Fact 1: Diverging trend between national versus local concentration. The divergence of the HHI for the fixed number of SIC × Geo units does not imply there is divergence in market power at the national and local levels. In the simulation of the Atkeson and Burstein (2008) economy, market power depends on the number of competitors N within the

market, which can increase or decrease even if the number of firms within a SIC × Geo unit increases.

Fact 2: Pervasive diverging trends. The paper finds a significant role for this trend across different sectors, which is very pronounced in the services sector. The paper does a wonderful job drawing attention to the role of national chains and big box retailers such as Walmart. The development in services shows that the third premise I outlined (i.e., the ratio of establishments to firms has risen) is most acutely present in the services sector. We expect therefore to find the biggest national versus local dichotomy in the HHI there.

Fact 3: The role of top firms. Large national firms make the mechanical force behind the dichotomy stronger. This also raises the question of reallocation of market share from low-markup firms to high-markup, superstar firms. That reallocation is large and accounts for two thirds of the rise in market power (see Autor et al. 2017; De Loecker, Eeckhout, and Unger 2020). This also raises the question of the efficiency-increasing effect of reallocation to which I turn below.

Fact 4: When a top firm comes to town. Using case studies, the paper shows that the entry of large firms in local markets leads to an increase of competition, not a decline. In the light of our four premises, as population grows we must see an increase in the number of establishments. Yet at the same time, with the SIC × Geo units constant, there is a decline in the HHI due to an increase in the number of establishments. Because some of those entrants will be top firms like Walmart, it is no surprise that entry is accompanied by a decline in the local HHI. Equally important, the strategy of top firms in which location to open new stores is not random. They will open where the demand is growing fastest and where, as a result, the HHI declines fastest. This is indeed what Holmes (2011) finds: Walmart selectively opens where the demand in its distribution network grows fastest. Houde, Newberry, and Seim (2017) find similar results for Amazon's strategy to develop its distribution network of fulfillment centers. This selection further reinforces the perception that entry of top firms leads to a decline in the local HHI, through the mechanical effect of population growth on the HHI.

III. Unobserved Market Structure in Macro

Using an invariant SIC × Geo definition of a market on which to calculate the HHI is not an adequate method to measure market power. In macro, the obstacles related to the vast heterogeneity across sectors

and technologies and the desire to analyze long time series make it substantially more problematic than in IO. If it does not work for cement and breakfast cereal, it is unlikely that the HHI will inform us for the entire macro economy over a long period of time. This then begs the question what we can do in macro to study the evolution of market power.

In the absence of observing who competes with whom, what the market boundaries are, and what the preferences and technology are, there are existing methods to measure market power in the macro economy. The demand method of Berry et al. (1995) has been enormously successful in IO, but it is unlikely that we will have the data and the computational power to extend beyond their specifically defined markets, such as the markets for cars, breakfast cereal, beer, and cement.

The production approach building on Hall (1988), but now applied to firm-level data instead of aggregate data, shows that we can obtain reliable estimates at the firm or establishment level for a large set of firms in the economy with limited data requirements (for the United States, see De Loecker et al. 2020). This enables us to evaluate the evolution of the distribution of market power at different levels of (dis)aggregation and local markets, including the global economy (see De Loecker and Eeckhout 2018).

But the ambition in macroeconomics goes one step further beyond mere measurement. We want to perform welfare analysis, do counterfactuals, and evaluate the impact of policy interventions. To that effect, I suggest that we approach market structure in the same way we approach total factor productivity (TFP). A scholar in management might enter a BMW factory and literally measure the production function, that is, how the factory transforms quantities of inputs (e.g., materials, labor, management, capital, or patents) into quantities of output (how many cars roll off the assembly belt every day).

Because of the shortcomings of measurement and data, and because of the huge heterogeneity in production technologies, this method is impossible to measure TFP in the macro economy. Instead, as macroeconomists we collect information on aggregate inputs and outputs and impose a structural model of production (with or without heterogeneity) to infer TFP as the residual. This is the celebrated Solow residual approach to measuring productivity. The information is highly aggregated and by no means as detailed as the micro-level production function the management scholar at BMW estimates, but it does allow us to estimate welfare and counterfactual experiments. And most importantly, it informs us about the evolution of TFP throughout the economy.

Likewise, even if the IO economist can infer the structure from a narrowly defined market, the macroeconomist has neither the data nor the tools to do that. So I suggest we treat the market structure as the residual that we estimate through the lens of a model. We observe the quantities of inputs, prices, and wages, and we observe revenues and profits. Then in a model with oligopolistic markets, we can use those observables—either those moments from the aggregate distribution or micro-level observations—to match the model-generated moments with the moments we observe in the data. We do not observe who competes with whom, but we know that the revenue and markups that we observe in the data are consistent with the number of competitors, the entry costs that determine the selection of firms that enter, and so on.

Matching the aggregate moments of the data on markups and fixed costs, De Loecker et al. (2018) find that the entry costs in 1980 were a lot lower than in 2016 and, most importantly, that the number of competitors has decreased substantially between 1980 and 2016.[7] The IO economist, rightly, complains that this approach is too broad, just like the management researcher in the BMW factory complains that the TFP measures using the Solow residual lack detail and precision. And I agree. But it is the only alternative we have if we want to make statements regarding market power in the aggregate economy. The benefit of this approachis that we can analyze why markups change, we can do counterfactuals, and we can evaluate policy interventions.

For example, the approach to back out the market structure as the residual allows us to address the major issue that the paper under discussion set out to answer in the first place: Is the rise of dominant, national firms that are highly productive welfare improving? Those firms are dominant because they are more productive. The most important implication is that those productive firms can set lower prices and thus obtain a larger share of the market. This leads to the reallocation of revenue share toward highly productive firms and is positive for consumers because prices are lower. But those dominant firms also exert market power. The deadweight loss that results from the rise in market power is detrimental for the consumer. In addition to the effect of selection of which firms enter and stay in the market, an effect that is ambiguous, we can calculate the overall effect on welfare. In De Loecker et al. (2018) we find that the net effect is negative. The negative effect of the deadweight loss dominates the positive effect from reallocation, while the selection effect is small. Technological change whereby national chains enter local markets to compete and drive down prices is on average anticompetitive.

IV. Conclusion

This paper draws attention to an important issue in macroeconomics: the evolution of market power over time and across the entire economy. The macroeconomics dimension of market power is as important as the detailed microeconomic and market-specific aspects that inform policy, such as merger review. Instead, economy-wide changes in market power have general equilibrium effects on the labor market, on wages and on wage inequality, as well as on all other realms of the economy. The paper deserves all the credit for putting this issue in the spotlight.

Unfortunately, the paper does not deliver on answering the question of whether there is indeed divergence in national versus local market power, as opposed to concentration. Nor does it answer the question of whether dominant national chains are welfare improving. I show that HHI measures are not adequate tools to study market power in the macro economy. In particular, there is a mechanical relation between the HHI and demographic change. The nature of the macro economy poses even bigger challenges than those already faced by IO. Based on solid grounds, the IO literature has resolutely decided to dispense with HHI measures. In macro we cannot ignore 30 years of research progress in IO, especially because the macro difficulties are even bigger than those in IO.

I propose that to study market power in the macro economy, we instead rely on firm-level measures of markups and profits rather than concentration measures. And to measure the market structure we need to give up on the detailed description of markets that micro studies can measure. Instead, I propose that we treat the market structure in the same way we treat TFP. We back out TFP as a Solow residual in the context of a model, and in the same manner, I suggest we back out the market structure (the number of competitors, entry costs, etc.) using firm-level data for the macro economy.

All the same, the thought-provoking findings in this paper have been instrumental in stimulating research into the macroeconomics of market power. I am optimistic that other work will take on the challenges in this paper and further our understanding of this important issue.

Endnotes

Author email address: Eeckhout (jan.eeckhout@upf.edu). ICREA-GSE-CREi. I would like to thank Jan De Loecker and Shubhdeep Deb for discussions and comments. This research received financial support from the ERC, advanced grant 339186, and from

ECO2015-67655-P. For acknowledgments, sources of research support, and disclosure of the author's material financial relationships, if any, please see https://www.nber.org/books-and-chapters/nber-macroeconomics-annual-2020-volume-35/comment-diverging-trends-national-and-local-concentration-eeckhout.

1. In historical times, enterprises such as the Dutch and the British East India Company were built on the premise of exclusive trading rights that effectively granted them monopoly power. And even in ancient Greece writings there are mentions of monopoly power that derives from patents. More formally, as early as 200 years ago, Cournot (1838) derived a mathematical formulation of what is now known as the Cournot-Nash oligopoly equilibrium.

2. See Hall (1988) for the initial contribution proposing to use the firm's cost minimization decision to back out marginal cost and hence markups. Although Hall (1988) uses aggregate data, De Loecker and Warzynski (2012) and De Loecker et al. (2020) have used firm-level data to calculate firm-level markups and generate an economy-wide distribution of markups.

3. Another well-known issue is the problem of missing data. Clearly, the HHI changes if observations are missing. This is a well-known issue that affects the National Establishment Time Series (NETS) data in particular.

4. This spurious dichotomy does not only apply to market power in the output market. In the case of market power in the labor market, frictions to mobility between local markets lead to monopsony and hence markdowns on wages. Based on measures of the HHI in local labor markets, one would also erroneously conclude that monopsony power has been declining. Instead, Deb, Eeckhout, and Warren (2020) find that wage markdowns have been constant since the 1980s.

5. We maintain the parameter configuration: within-sector elasticity $\eta = 10$; between-sector elasticity $\theta = 1.5$; mean of log productivity $\mu = 1$; variance of log productivity $\sigma^2 = 0.2$.

6. Define E and F as the total number of establishments and firms in the economy, where $E/F = r$ is the average establishment-to-firm ratio. Let $N_s F_1$ be the number of SE firms and F_m is the number of ME firms. Let $E_1 = 1$ and E_m be the number of establishments of the two types of firms. Then $F_1 + F_m = E/r$ and $F_1 + E_m F_m = E$, implying that $F_m = (E - F)/(E_m - 1)$.

7. See also Deb et al. (2020) and Eeckhout, Patel, and Warren (2020) for estimation of the market structure using micro data.

References

Anderson, E., S. Rebelo, and A. Wong. 2018. "Markups across Space and Time." Technical report, NBER, Cambridge, MA.

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

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." Technical report, Centre for Economic Performance, LSE, London.

Berry, S., J. Levinsohn, and A. Pakes. 1995. "Automobile Prices in Market Equilibrium." *Econometrica* 63:841–90.

Bresnahan, T. F. 1989. "Empirical Studies of Industries with Market Power." *Handbook of Industrial Organization* 2:1011–57.

Cournot, A. A. 1838. *Researches into the Mathematical Principles of the Theory of Wealth*. New York: Macmillan.

De Loecker, J., and J. Eeckhout. 2018. "Global Market Power." Working Paper no. 24768, NBER, Cambridge, MA.

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* 135:561–644.
De Loecker, J., and F. M. P. Warzynski. 2012. "Markups and Firm-level Export Status." *American Economic Review* 102:2437–71.
Deb, S., J. Eeckhout, and L. Warren. 2020. "The Macroeconomics of Market Power and Monopsony." UPF mimeo.
Eeckhout, J., A. Patel, and L. Warren. 2020. "The Contribution of Market Power to Wage Inequality." UPF mimeo.
Hall, R. 1988. "The Relation between Price and Marginal Cost in U.S. Industry." *Journal of Political Economy* 96:921–47.
Holmes, T. J. 2011. "The Diffusion of Wal-Mart and Economies of Density." *Econometrica* 79:253–302.
Houde, J.-F., P. Newberry, and K. Seim. 2017. "Economies of Density in E-Commerce: A Study of Amazon's Fulfillment Center Network." Technical report, NBER, Cambridge, MA.
Melitz, M. 2003. "The Impact of Trade on Aggregate Industry Productivity and Intra-Industry Reallocations." *Econometrica* 71:1695–725.
Melitz, M. J., and G. I. Ottaviano. 2008. "Market Size, Trade, and Productivity." *Review of Economic Studies* 75:295–316.