

RESPONSE TO :

COMMENTS ON MARKET POWER AND WAGE
INEQUALITY BY [VIOLANTE \(2023\)](#) AND
[VAN REENEN \(2023\)](#)

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[Violante \(2023\)](#) and [Van Reenen \(2023\)](#) offer a comprehensive review and point out the key aspects of the paper. We are grateful for their comments which have greatly improved this research.

Our goals in this paper are twofold: 1) to provide a methodological framework that jointly incorporates goods market power (oligopoly) and labor market power (oligopsony) in a general equilibrium setting, and 2) to propose an empirical strategy for applying such a framework to microdata to estimate key structural parameters and a joint distribution of establishment-level productivity. Combined, these features allow us to quantify the relative importance of the impact of technological change and changes in market structure on the labor market, in particular on the evolution of wages, wage stagnation, and wage inequality. The main insight of our model is that market power and wage inequality are both endogenous objects, determined simultaneously in equilibrium by 1) the market structure (the number of competing firms), 2) the dispersion

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of establishment-level productivity, and 3) the substitutability parameters in the product and labor markets.

We find that a change in the market structure (excluding changes in the dispersion of productivity and within- and between-market substitutability parameters) accounts for 8.1% of the rise in the skill premium, and 54.8% of the increase in between-establishment inequality. Our analysis also establishes that technology is indeed the main driver of wage inequality, whereas the decline in competition is behind the increasing gap between wages and productivity.

Both commentators rightly point out that our assumption of perfectly *overlapping boundaries* between product and labor markets is strong. We agree, and nonetheless maintain this simplifying assumption for two reasons. The first is for computational tractability, as allowing for non-overlapping boundaries greatly increases the dimensionality of the system of equations needed to compute the economy's equilibrium.¹ Second, the assumption allows us to estimate the market structure without using time-invariant market definitions based on industry, occupation, or geography.² Additional future work is needed to establish whether, in which direction, and by what magnitude non-overlapping markets will alter our results with multiple skilled inputs. Despite the simplification in our analysis, our model provides a computationally tractable way to analyze the effect of imperfect competition on labor market inequality.

Both commentators further emphasize the need to carefully disentangle the *sources* of firms' market power. We agree that it is important to understand whether rising markups are due to lax antitrust enforcement or to past investments. While the nature of our model (static and without entry) makes it difficult to definitively attribute rising markups to investment or lax antitrust enforcement, our estimated distribution of establishment-level

¹If there were overlapping boundaries, instead of solving for the equilibrium market by market, we would have to compute a system of equations where all strategically competing establishments are solved simultaneously. This could potentially encompass the entire economy. Recent work by [Gutiérrez \(2022\)](#) allows for overlapping product and labor market boundaries in a framework with labor as the sole input in production to study the pro-competitive gains from trade. He finds that labor and product market power interact with each other amplifying rather than dampening the pro-competitive gains from trade.

²In addition, recent work by [Jarosch et al. \(2019\)](#) and [Nimczik \(2020\)](#) has relied on data-driven methods using worker flows and stochastic block models to identify local labor markets, as opposed to a priori choices such as industry or geography. We see the identification of labor and product markets as an important avenue for future research.

productivity provides two valuable insights: first, we can evaluate the resulting productivity dispersion without distinguishing the sources, and second, how this dispersion has changed over time. An important contribution of this research is that technology dispersion by itself is a source of market power. In this sense, in our framework, more dispersed firm productivity implies a more dispersed distribution of markups and markdowns, which is a sign of greater inefficiency. This is in contrast to the framework developed in [Hsieh and Klenow \(2009\)](#), where firm-specific wedges, while a source of misallocation, are primitives of the model and do not endogenously change with the productivity distribution. Furthermore, our model distinguishes two sources of misallocation: product and labor market power. Our more general framework also highlights the importance of accounting for establishment-specific product and labor market power in estimating productivity distributions. As our model shows, excluding market power from the analysis biases estimates of the underlying productivity dispersion, which has not been considered in the general equilibrium framework studying technological change (see for example [Patel \(2021\)](#); [Bárány and Siegel \(2021\)](#)). Finally, contemporaneous work has begun to shed light on distinguishing the sources of rising market power, attributing a key role to technological change, in particular the role of fixed costs and productivity dispersion ([De Loecker et al. \(2018\)](#); [Deb \(2023\)](#); [De Ridder \(2023\)](#)), and innovation ([Bao and Eeckhout \(2023\)](#); [Olmstead-Rumsey \(2023\)](#)).³ In addition to technological explanations, firms use a broad range of tactics that allows them to build market power, including common ownership, abusing the patent system,... In our model without this amalgam of additional sources of market power, all those are absorbed in the technology and market structure which is likely to change the estimates, though it is not immediately clear in which direction.

Of course, one major change in the economy is globalization. While globalization has its own specifics, we think of globalization as a form of technological change. Most notably, the China shock which potentially replaced low-skilled manufacturing jobs, would show up in our model as a decline in the estimates of the low-skilled productivity distri-

³Those explanations are in addition to the micro-founded sources of technological change due to capital-skill complementarities, see for example [Krusell et al. \(2000\)](#).

bution due to declining employment of low-skilled workers in these establishments. We like to believe that globalization can be interpreted as a form of technological change due to the advancement of transportation and information technology, in the same way that outsourcing (say of cleaning services or a call center) within an economy is interpreted as technological change.

[Violante \(2023\)](#) further rightly qualifies our welfare analysis. Our view that the level of wage inequality is Pareto efficient in the absence of market power is true within the limits of our framework. The only source of inefficiency in our model is Cournot competition. This leads to market power, which depends on the dispersion of firm productivities and the imperfect substitutability of worker and consumer preferences in addition to the number of competitors. Of course, we fully agree that this is not a complete description of reality. Other sources can lead to inefficiencies, such as market incompleteness (uninsurable wage volatility or risk) or frictional reallocation of labor due to uneven technological change. These alternative sources of inefficient outcomes reduce welfare and open additional avenues for welfare-enhancing policies such as educational reforms and slowing the rate of technological adoption.

Finally, [Van Reenen \(2023\)](#) raises an excellent point that in bargaining models, increased product market power can potentially raise wages.⁴ As rents rise, rent sharing will bestow a larger piece of the pie to the rent-sharing parties.⁵ This point is also made in [Kaplan and Zoch \(2022\)](#) and in [Bao et al. \(2022\)](#) where managers have span of control that leads to surplus sharing in a matching market. However, it is not clear ex-ante that surplus sharing will lead to an increase in the wage level of all workers, even if it raises wages for workers in firms that gain market power. This is likely to depend on the effect on equilibrium employment of increased market power and changes in workers' outside options. This is related to the point that [Violante \(2023\)](#) raises regarding declining

⁴Note that our model can also incorporate a joint increase in wages and product market power in equilibrium. In our framework, a rise in the dispersion of productivity will translate into increased market power (both in the product and the labor markets) for relatively more productive firms as well as an increase in wages for workers within these firms.

⁵Note that contrary to rent sharing, in our model as market power increases, the share that goes to workers decreases. This is true both for monopoly power in the goods market – with the ensuing general equilibrium decline in wages – or monopsony power in the labor market. Indeed, in [Deb et al. \(2022\)](#) we show that the majority of the change in wages is due to goods market power.

union membership. In our setting, the effect of union membership would show up in the estimates of the labor market substitutability parameters. However, if union membership declines over time, then this would in our model be picked up by a decline in the productivity parameters.

The commentators of this paper have opened several avenues for future work that can build on this discussion. The economic question under investigation is big: market power has important implications for wage inequality, and we need to dig deeper to fully understand the underlying mechanisms. Most importantly, because market power is a source of inefficiency, there are important policy implications that hinge on the outcome of this debate in order to create a more efficient economy with higher welfare for all. This discussion provides a first step in that direction.

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