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A COMMENT ON: *"Walras–Bowley Lecture: Market Power and Wage Inequality" by Shubhdeep Deb, Jan Eeckhout, Aseem Patel, and Lawrence Warren*

GIOVANNI L. VIOLANTE
Department of Economics, Princeton University

ONE OF THE MOST EXCITING NEW TRENDS in macroeconomics is the development of general equilibrium models with oligopolistic product markets in which a discrete number of firms interact strategically and exploit their market power to set an endogenous wedge between price and marginal cost. This literature is largely motivated by a novel set of empirical findings establishing that market concentration has increased and/or price markups have risen at the aggregate level. Heightened market power has already proved to be helpful in explaining a number of major macroeconomic trends in the United States, such as the decline in the labor share (Autor, Dorn, Katz, Patterson, and Van Reenen (2020)), the fall in business dynamism and innovation rate (Akcigit and Ates (2019)), the investment slowdown (Gutiérrez and Philippon (2017)), and the deteriorating net foreign asset position (Atkeson, Heathcote, and Perri (2022)).

Jan Eeckhout is a coauthor of one of the earliest and most influential papers on this topic (De Loecker, Eeckhout, and Unger (2020)), and a leader of this literature. In this Walras–Bowley lecture, Eeckhout and coauthors (DEPW, thereafter) ask whether stronger product market power can also quantitatively account for three salient shifts in the U.S. wage structure over the last two decades: growing skill premium, stagnant average wages, and the between-firm component explaining most of the rise in wage inequality.

For this purpose, DEPW develop a structural model in the spirit of Atkeson and Burstein (2008) and Berger, Herkenhoff, and Mongey (2022), two other seminal contributions in this literature. This approach has been especially successful because it obtains a rich market structure with endogenous markups that nests perfect competition, monopolistic competition, and monopoly, while retaining analytical tractability thanks to the within- and between-sector CES aggregators, and the continuum of sectors assumption implying that no individual firm can affect the aggregate price and wage indexes. The specific contribution of DEPW is to simultaneously apply this elegant framework to both product and labor markets, while also allowing for heterogeneity in the degree of skill-biased technical change (SBTC, thereafter) at the establishment level. As a result, the model incorporates three potential sources of changes in the wage structure: shifts in technology, rising monopsony power, and rising monopoly power.

The impact of skill-biased technical change on the wage structure is well understood. Market power affects the wage structure via two channels. First, individual firms have monopsony power in both the skilled and unskilled labor markets, that is, they face an upward sloping labor supply curve (e.g., because of frictions in labor mobility or idiosyncratic preferences for jobs). Firms can therefore pay wages below the worker's marginal product. Stronger monopsony power implies wider wage markdowns, and lower average wages. A larger rise in monopsony power in the unskilled labor market relative to the

Giovanni L. Violante: violante@princeton.edu
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skilled one implies a growth in the skill premium. Second, firms have product market power. An increase in market power induces firms to raise good prices and, by moving up their demand curve, to produce less output and demand less labor. As long as this shift is generalized and occurs across many product markets, the aggregate demand for labor falls and so does the wage. If this force is stronger for firms that are more unskilled-labor intensive, the skill premium will rise. In addition, if the rise in average markups and markdowns is accompanied by a growth in their dispersion, wage inequality between establishments will also expand.

DEPW estimate their model and infer that both the average and the variance of markups increased substantially from 1997 to 2016, but markdowns remained stable and therefore played no role in determining long-run inequality trends. The first finding is consistent with previous research by Jan Eeckhout and his coauthors. Their second result on stable wage markdowns since the late 1990s is in line with other work, for example, by Yeh, Macaluso, and Hershbein (2022).

Next, through a series of counterfactuals, DEPW reach the following three conclusions on the impact of the decline in competition in goods and labor markets on the wage structure: (1) it explains only 1/12 of the modest (15%) expansion in the skill premium during this period, the rest being the outcome of SBTC; (2) it leads to a decline of real wages of over 10%; (3) it accounts for 60% of the between-establishment component of the growth in wage inequality.[1]

To put these findings in context, recall that—besides technical change—traditionally the macro and labor literature on this topic has put much emphasis on globalization and institutions. Both factors are absent from the model. Research on the China shock, especially relevant for the period under study, has concluded that workers employed in industries exposed to trade with China have suffered significantly (Autor, Dorn, and Hanson (2016)). Within the DEPW model, this channel would be isomorphic to technological change. As for institutions, the minimum wage has been steady in real terms since the late 1990s. Union membership, already down to 13% at the start of the sample period, has further declined by 3 pp. Overall, though, my conjecture is that institutional shifts were not first-order during the period 1997–2016.

Turning to technical change, my view is that while the framework is 'state-of-the-art' in terms of modeling market power, it is—understandably—stylized in its representation of how technological change can affect the wage structure. SBTC is how the first generation of models thought of the mapping between technological change and wages (Katz and Murphy (1992)). The first evolution of SBTC is the idea of capital-skill complementarity (Krusell, Ohanian, Rí os-Rull, and Violante (2000)). Besides the clear advantage of microfounding an unobservable trend (SBTC) with observables (the capital-labor ratios), this theory has also the ability to generate a fall in real wages of unskilled labor without any technological regress. The need for a technological backslide is the authors' main complaint with respect to SBTC as a source of real wage declines, and what makes them favor a story based on rising market power. Consider a simple example where the aggregate production function is $Y = (K + \phi U)^{\alpha} S^{1-\alpha}$, with $0 < \alpha < 1$, where Y is output, K is capital, U is unskilled labor, and S is skilled labor. Here K and U are perfect substitutes, and so capital is more complementary with skilled labor. With competitive labor markets, the unskilled wage is $w_U = \alpha\phi(K + \phi U)^{\alpha-1} S^{1-\alpha}$. Ceteris paribus, an increase in

[1]Heathcote, Perri, Violante, and Zhang (2023) documented that the rise in the U.S. college premium has slowed down dramatically since the late 1990s, early 2000s.

K (e.g., because of a decline in the relative price of capital) reduces the marginal product of unskilled labor and the unskilled wage without recurring to a technological relapse.

In the last decade, the study of the relation between technology and wages has moved from the skill space to the task space (Autor, Levy, and Murnane (2003)). As theorized by Acemoglu and Restrepo (2022), adopting certain technologies (e.g., automation) can displace tasks away from workers toward machines, thereby reducing the marginal product of labor and average wages. Finally, a more advanced modeling of technological change can also explain why most of the rise in inequality has occurred between, rather than within, firms. Freund (2022), for example, argued that production tasks have become more complex over time, and this shift in the nature of tasks requires more worker specialization and stronger quality-complementarity among coworkers within a firm. In equilibrium, firms hiring in frictional labor markets pay more dispersed average wages reflecting more pronounced coworker sorting. Micro data for Germany support this interpretation of the dynamics in the between-firm component of inequality.

In sum, a more sophisticated representation of technological change, in line with the most recent developments of the literature, could possibly crowd out part of what the DEPW analysis currently attributes to growing market power. This impressive paper will certainly spur numerous other studies that will try to distinguish the role of technology, globalization, institutions, and market power in determining the wage structure. A fresh example in this vein is Vogel (2022).

The main reason why this research agenda is so important is that the welfare implications of rising wage inequality depend on its causes. DEPW write that: *If we attribute a substantial role to market power, then wage inequality is inefficient [. . .] Instead, if there was no market power, the amount of wage inequality would be Pareto efficient and there would only be a role for policy based on equity grounds and redistribution, without any scope for efficiency enhancing intervention.* While I agree with the first part of this statement, on the second part my view is more nuanced. In Heathcote, Storesletten, and Violante (2010), we showed that an expansion in the skill premium can be welfare-improving as long as workers can take advantage of the new productive opportunities presented by skill-biased demand shifts through higher investment in human capital. Nonetheless, there are several reasons why, even in absence of market power, a rise in wage inequality could reduce welfare, even abstracting from equity considerations. First, to the extent that higher cross-sectional wage inequality is also associated with higher uninsurable individual wage volatility, policies that improve social insurance are welfare enhancing. Second, if returns to human capital rise, policies that remove impediments for the poor, but able, kids to access education and reap these higher returns can increase productive efficiency by lowering misallocation. Third, if technology adoption displaces workers, when labor reallocation is frictional, firms adopt inefficiently fast, and policies that slow down adoption can be welfare enhancing (Beraja and Zorzi (2022)). In the presence of market power, the question whether technology-induced changes in the wage structure are efficient or not is even more subtle. Consider automation technologies that replace expensive labor services with tasks performed by machines. In this context, wider price markups and profit margins could lead to inefficiently fast automation, but wider wage markdowns and lower labor costs could lead to inefficiently slow automation.

Looking ahead, I see at least two major areas of improvement for this literature. The first one is the exact definition of a product and labor market. Research in IO takes this point extremely seriously and confines its analysis to well-defined markets where goods are fairly homogeneous and highly substitutable (e.g., cereals, cement, etc.). This is both a blessing and a curse. It is a blessing because one can more easily model all the precise features and institutions playing a role in that specific market. It is a curse because

the risk is not seeing the forest for the trees. It is not by chance, in my view, that it was largely macroeconomists (Jan Eeckhout and Thomas Philippon, to name two)—by training, more preoccupied with the big questions and the big picture—who uncovered the aggregate trend in markups and concentration, and placed this important issue to the forefront of the worldwide policy agenda.

In the absence of detailed data on the demand system of each individual product and labor market in the economy, making progress at the macro level requires some strong assumptions. Specifically, DEPW assume that: (1) establishments within an industry are randomly assigned to markets, and (2) the market definition of goods coincides with the market definition of the labor inputs, implying that the same set of firms compete in both the product and labor market simultaneously. Markets are then identified by the sales and wage bill distributions in the data. While this is a clever strategy to reduce the dimensionality of the problem, my hope is that a fruitful interaction between IO, labor, and macroeconomists will lead to a more satisfactory solution which preserves tractability in macroeconomic models. Jarosch, Nimczik, and Sorkin (Forthcoming), for example, have already made some headway toward a convincing identification of labor markets.

In addition, future research should dig deeper into the fundamental causes of market power and its secular shift because the discussion surrounding welfare implications and policy interventions hinges on this. A surge in measured markups and indicators of concentration can be due to weaker anti-trust enforcement which hampers competition in favor of rent seeking. Or, it can be due to higher fixed costs of entry, for example, because of the necessary adoption of some costly technology which is offset by higher expected future profits. Then, revenues in excess of those necessary to cover current costs simply indicate a return on past investments (Berry, Gaynor, and Morton (2019)). In a recent paper, Jan Eeckhout and coauthors (De Loecker, Eeckhout, and Mongey (2021)) are already making progress on this crucial question which will, arguably, define the second generation of this exciting literature.

REFERENCES

Acemoglu, Daron, and Pascual Restrepo (2022): "Tasks, Automation, and the Rise in US Wage Inequality," *Econometrica*, 90, 1973–2016. [639]

Akcigit, Ufuk, and Sina T. Ates (2019): "What Happened to US Business Dynamism?" Tech. rep, National Bureau of Economic Research. [637]

Atkeson, Andrew, and Ariel Burstein (2008): "Pricing-to-Market, Trade Costs, and International Relative Prices," *American Economic Review*, 98, 1998–2031. [637]

Atkeson, Andrew, Jonathan Heathcote, and Fabrizio Perri (2022): "The End of Privilege: A Reexamination of the Net Foreign Asset Position of the United States," Tech. rep, National Bureau of Economic Research. [637]

Autor, David, David Dorn, Lawrence F. Katz, Christina Patterson, and John Van Reenen (2020): "The Fall of the Labor Share and the Rise of Superstar Firms," *The Quarterly Journal of Economics*, 135, 645–709. [637]

Autor, David H., David Dorn, and Gordon H. Hanson (2016): "The China Shock: Learning From Labor-Market Adjustment to Large Changes in Trade," *Annual Review of Economics*, 8, 205–240. [638]

Autor, David H., Frank Levy, and Richard J. Murnane (2003): "The Skill Content of Recent Technological Change: An Empirical Exploration," *The Quarterly Journal of Economics*, 118, 1279–1333. [639]

Beraja, Martin, and Nathan Zorzi (2022): "Inefficient Automation," Tech. rep, National Bureau of Economic Research. [639]

Berger, David, Kyle Herkenhoff, and Simon Mongey (2022): "Labor Market Power," *American Economic Review*, 112, 1147–1193. [637]

Berry, Steven, Martin Gaynor, and Fiona Scott Morton (2019): "Do Increasing Markups Matter? Lessons From Empirical Industrial Organization," *Journal of Economic Perspectives*, 33, 44–68. [640]

De Loecker, Jan, Jan Eeckhout, and Simon Mongey (2021): "Quantifying Market Power and Business Dynamism in the Macroeconomy," Tech. rep, National Bureau of Economic Research. [640]

De Loecker, Jan, Jan Eeckhout, and Gabriel Unger (2020): "The Rise of Market Power and the Macroeconomic Implications," *The Quarterly Journal of Economics*, 135, 561–644. [637]
Freund, Lukas (2022): "Superstar Teams: The Micro Origins and Macro Implications of Coworker Complementarities," Tech. rep, Cambridge University. [639]
Gutiérrez, Germán, and Thomas Philippon (2017): "Investmentless Growth: An Empirical Investigation," Brookings Papers on Economic Activity, 89. [637]
Heathcote, Jonathan, Fabrizio Perri, Giovanni L. Violante, and Lichen Zhang (2023): "More Unequal We Stand? Inequality Dynamics in the United States, 1967–2021," *Review of Economic Dynamics*, 50, 235–266. [638]
Heathcote, Jonathan, Kjetil Storesletten, and Giovanni L. Violante (2010): "The Macroeconomic Implications of Rising Wage Inequality in the United States," *Journal of Political Economy*, 118, 681–722. [639]
Jarosch, Gregor, Jan Sebastian Nimczik, and Isaac Sorkin (forthcoming): "Granular Search, Market Structure, and Wages," *Review of Economic Studies*. [640]
Katz, Lawrence F., and Kevin M. Murphy (1992): "Changes in Relative Wages, 1963–1987: Supply and Demand Factors," *The Quarterly Journal of Economics*, 107, 35–78. [638]
Krusell, Per, Lee E. Ohanian, José-Víctor Rí os-Rull, and Giovanni L. Violante (2000): "Capital-Skill Complementarity and Inequality: A Macroeconomic Analysis," *Econometrica*, 68, 1029–1053. [638]
Vogel, Jonathan (2022): "The Race Between Education, Technology, and Institutions," Tech. rep, National Bureau of Economic Research. [639]
Yeh, Chen, Claudia Macaluso, and Brad Hershbein (2022): "Monopsony in the US Labor Market," American Economic Review. [638]

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