Inequality

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Market power and labour market inequality

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Introduction

Technological change is often proposed as the main driver behind the enormous rise in inequality in the UK and elsewhere in the last four decades. Some workers have become extremely productive, be it because their skills have become much more valuable because the falling prices of capital goods such as tech products enhance their productivity, or because the reach of what they produce now extends so far in a global economy that any small differences in ability are amplified, with enormous winner-take-all benefits. In contrast, those less fortunate have seen stagnating wages. An open question is what the role is of firms, and of inequality of firms. And because firm size is intimately related to market power, the question is what the role is of market power for inequality in the labour market. Does market power offer an alternative (and complementary) explanation to technological change for the rise in inequality?

The chapter by De Loecker, Obermeirer and Van Reenen (2022) offers a fascinating account of the role of firms and inequality in the UK economy. In broad lines, their facts confirm the trends in the United States and in countries in the European Union. Productivity growth has slowed down, firm productivity dispersion has increased, mark-ups, mark-up dispersion and concentration have increased, and there is a rise in the concentration of large firms. At the same time, this evolution that is transforming the distribution of firms is accompanied by fundamental changes in the labour market: wage growth has slowed down, wage dispersion across firms has increased, and business dynamism (firm creation and labour reallocation) have declined.

Firm inequality (in mark-ups, profits, employment, sales, etc.) is closely intertwined with market power. Firms that exert market power tend to be larger for two reasons: (1) market power often stems from a smaller number of competitors, which means the same market is served by fewer firms who have higher market shares; (2) even if the number of competitors remains the same, market power often originates in technological advantage and hence heterogeneity in productivity – with more productivity dispersion, mark-ups, as well as mark-up and firm size dispersion, increase. For much of what follows in this discussion, I focus on labour market inequality due to market power. And while market power has the obvious efficiency implications and loss of consumer surplus, it also affects the labour market and inequality.

As De Loecker, Obermeirer and Van Reenen argue, society does not care about inequality between firms *per se*, only about inequality among people. Inequality between firms comes at the centre of the inequality debate if there is a link between firm inequality and inequality between people. When output and labour markets are perfectly competitive, the firm size and its distribution does not affect inequality in the labour market. Workers are paid their marginal product and firms generate such a marginal product in the most efficient way, whether that be in large or small firms.

Things are different when firms have market power. The first and most obvious source of inequality is the rise in profits and a decline in labour income. In this commentary, I discuss the

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findings in the chapter regarding the labour share in the UK. Even if inequality between workers does not change, this change in the distribution of resources will show up in an increase in inequality between capital and labour income, which will affect wealth inequality. Moreover, the increase in market power and firm inequality leads to an increase in the concentration of profits, which in turn affects the distribution of wealth. But there is not merely an issue of redistribution between profits and wages (or capital and labour). I also discuss the effect of market power on wage inequality *between* workers. Finally, I analyse the policy implications and the impact on welfare.

The labour share

Arthur Bowley (1937) first documented that the share paid to workers as compensation for their labour of an economy's output is constant over time and equal to two-thirds. Initially known as Bowley's law, it became one of the stylised facts that Kaldor (1957) aimed to explain in his model of growth.[2] While there have always been some fluctuations and there are differences in the measured level between countries, until the late 1970s the labour share was constant. Then, in a remarkable reversal, the labour share started to decline for a wide range of countries (see Karabarbounis and Neiman, 2014). In the United States, the labour shared dropped from 65% to 59%. Similar decreases occurred in most other developed economies, as shown by Figure 18 in the chapter (De Loecker et al., 2022).

The UK, however, is the one notable exception where the labour share has remained constant. In the chapter, De Loecker et al. (2022) use different data sources to measure the labour share, using aggregate accounts data (KLEMS), data from the Office for National Statistics (ONS), as well as firm-level data from Historical Orbis (HO). While there are some differences in the measured labour share between the different data sets, especially in the level, between the 1980s and now, there has first been an increase and then, starting in the early 2000s, a decline. Depending on the data source, the decline is more or less pronounced. But over the four decades, there is no decline. There is, however, an increase in the dispersion of the labour share, and there is a decline in some sectors, most notably manufacturing, services and wholesale.

The firm's labour share

So why does market power matter for the labour share? To represent things in a simplified manner, consider the following production technology in value added terms,[3] $y_i = A_i l_i^{\alpha} k_i^{\beta}$, where y_i is the firm's output, and labour l_i and capital k_i are the inputs in production. First, observe that if the profit share increases, then the sum of labour and capital shares must decline. In fact, because capital and labour are complements, an increase in the profit rate will lead to a decline in both the capital and the labour share:

$$p_i y_i = wl_i + rk_i + \pi_i \Rightarrow 1 = \underbrace{\frac{wl_i}{p_i y_i}}_{\text{labour share}} + \underbrace{\frac{rk_i}{p_i y_i}}_{\text{capital share}} + \underbrace{\frac{\pi_i}{p_i y_i}}_{\text{profit share}},$$

where w is the wage rate, r is the user cost of capital and π_i are profits.

Then, the firm that has market power chooses employment l_i to solve the first-order condition of profit maximisation, which implies the equilibrium labour share $wl_i/p_i y_i$,

$$p_i(1+\varepsilon_i)MPL_i = w \Rightarrow \frac{wl_i}{p_i y_i} = \frac{\alpha}{\mu_i},$$

[2] See also Eeckhout (2021) for a discussion.

[3] We assume there are no intermediate inputs or fixed costs.

where ε_i is the price elasticity of demand in the presence of market power and the mark-up

$$\mu_i = \frac{p_i}{w/MPL_i} = \frac{1}{1+\varepsilon_i}.$$

There is a direct, inverse relation between the firm's mark-up μ_i and the labour share. Firms that have higher mark-ups spend less on labour. At the firm level, there is a robustly significant negative correlation between mark-ups and the labour share in the US (see De Loecker, Eeckhout and Unger, 2020). The negative correlation with mark-ups holds also for the capital share, of which the chapter reports evidence of a decline. The remainder of the output goes to profits.

The aggregate labour share

The individual labour share is mute on one important aspect of inequality, which is the general equilibrium effect on wages. Individual firms take w as given, but if there is a large enough group of firms that exhibit an increase in market power, then this leads to a decline in demand in the aggregate. Even in a competitive labour market, with an aggregate upward-sloping labour supply curve, the decline in labour demand will lead to a drop in wages. When we calculate the aggregate labour share therefore, we obtain

$$\frac{wl}{py} = \sum_i m_i \frac{wl_i}{p_i y_i},$$

where m_i is the weight of the firm. The impact of widespread market power is a decline in aggregate output y, a decline in the wage rate w due to the general equilibrium effect, and a decline in labour force participation $L = \sum_i l_i$. Even if the labour share were constant, the rise of market power would lead to a decline in output and welfare. Still, we expect the decline in the economy-wide wage bill (via a decline in the wage rate and labour force participation) to be larger than the decline in output. Hence, the rise of market power is expected to lead to a decline in the aggregate labour share.

Why is the UK different?

Despite a similar evolution of market power in the UK, and given the tight inverse relationship between the labour share wl_i/p_iy_i and mark-ups μ_i at the firm level, it is absolutely puzzling that the aggregate labour share in the UK has not declined. This is one of the major challenges that De Loecker et al. (2022) pose and it is in want of an explanation. Let me propose some possible avenues along which we have a chance of gaining further insights. Each of these avenues dips into one or both of the following explanations: either the labour is indeed constant and there is a missing piece that can help us understand the puzzling dichotomy between the constant labour share and increasing mark-ups; or the labour share is decreasing but we need to make adjustments to measurement. I discuss seven possible explanations.

(1) **Heterogeneity and aggregation**. The inverse relation between the labour share and mark-ups holds at the firm level. To obtain the aggregate labour share, aggregation matters. This is particularly salient when heterogeneity across firms increases, as is the case during this period. The labour share aggregated from firm-level data is comparable with the labour share measured using aggregate accounts data (such as KLEMS) only if the weight used is the sales share of the firm, $m_i = p_iy_i/\sum_i p_iy_i$, which implies that

$$\frac{wl}{py} = \sum_i m_i \frac{wl_i}{p_i y_i} = \frac{\sum wl_i}{\sum_i p_i y_i}.$$

This is what De Loecker et al. (2022) do, so I do not think that this can explain the inconsistency. It is true that the different data sets lead to very different levels in the labour

share,[4] which may lead to the omission of important groups of workers in the case of the firm-level data, and can potentially generate systematic selection over time. Government services (which tend to have a higher labour share) and self-employment are often left out and the composition may have shifted.

Another issue can be due to the composition of sectors and industries. The labour share declines most in manufacturing, for example, and less in other sectors, and the particular UK composition of industries with a high representation of services may explain the dichotomy between rising market power and a constant labour share.

(2) **Overhead and fixed costs**. We know from the US data that overhead and fixed costs have increased. The labour share relation with mark-ups is only about variable, production labour. Overhead costs also include expenditure on labour, but that share of labour is not variable and cannot be linked to the mark-ups. Top incomes tend to be part of overhead costs, and if overhead costs in the UK consist disproportionately of labour, then we may see a declining variable labour share, but a constant labour share once overhead labour is included. The former determines mark-ups, whereas the latter is used in aggregate data.

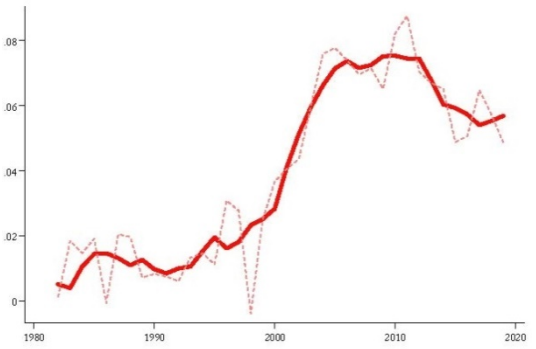
(3) **Profits**. We can get a hint of higher overhead costs from looking at profits (see Figure 1). Even under perfect competition, if overhead costs increase, mark-ups necessarily increase to avoid negative profits – so we may well see rising mark-ups whereas profit rates are not increasing. We see some clear evidence from publicly traded firms that profits in the UK have risen, especially since the mid-1990s, from around 2\% of sales to over 8\%. This is in line with the measure of profitability in the broader sample of firms in HO (EBITDA; see Figure 8 in De Loecker et al., 2022), though the increase is more moderate, from 9.5\% to 11.5\%.

If we look at the ratio of profits to the wage bill at the firm level (for publicly traded firms), that ratio is increasing from around 10\% to over 60\%. This is not surprising given the sharp rise in the profit rate and a constant wage bill share. So profits have gone up, and they have gone up relative to wages, which seems to support the notion that the labour share, at least in the publicly traded firms, must have decreased.

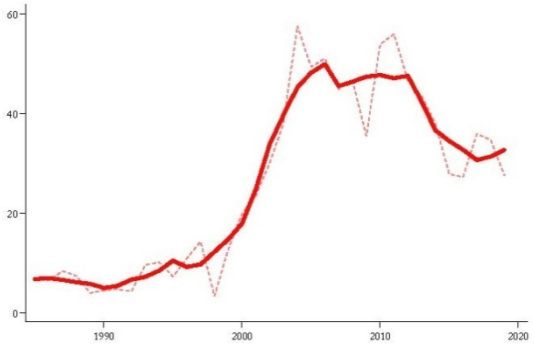
But this seems to be contrary to what we find when considering the market value as a measure of profitability. The market value is the discounted flow of expected dividends and hence profits. Figure 1(c) shows the average ratio of market value to sales. For the same data, we see that this measure of profits is at the same level now as it was in the late 1990s. The inflation-adjusted stock market index for the UK confirms the absence of growth in the average stock market valuation (Figure 1(d)). This seems to suggest that for the same firms, market value as a share of sales has not increased while the profit rate has. This contradictory finding is puzzling – especially as these findings refer to the same sample of publicly traded firms – and might shed some light on what is happening with the measurement of the labour share. After all, profits are the residual of value added after payroll and the user cost of capital (the latter share has also decreased).

[4] The labour share for KLEMS data is in the range 0.7–0.75; for the ONS data, it is 0.5–0.57; and for the HO data, it is 0.61–0.68.

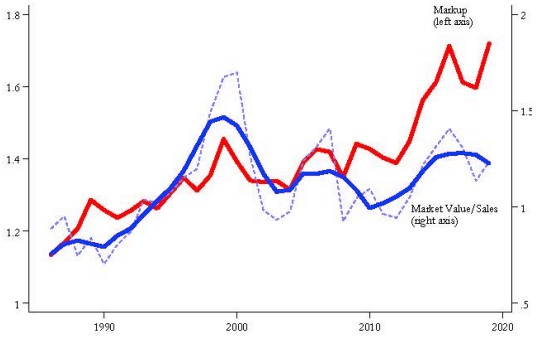
Figure 1. Profitability of publicly traded firms in the UK



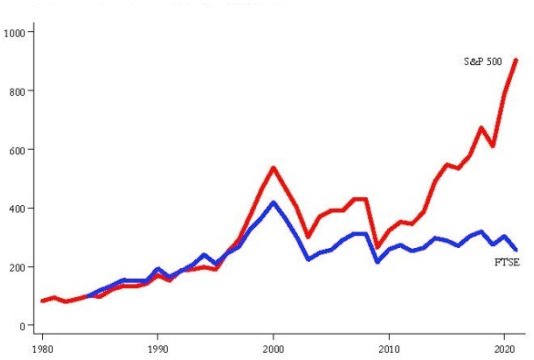
(a) Aggregate profit rate in the UK



(b) Average ratio of profits to wage bill (%)



(c) Market value and mark-ups in the UK



(d) Inflation-adjusted financial indices (1984 = 100) in the UK and the US

(4) **Top income inequality**. This is related to point (2), the rise in overhead and fixed costs. The mark-up is calculated based on variable inputs. If overhead expenditures contain a large fraction of labour, then even if we see a rise in mark-ups and a decline in the labour share of productive labour, the total labour share of the firm including overhead labour may not have declined. In the aggregate labour share based on national accounts data, overhead labour is included and hence the aggregate labour share is stable, while mark-ups increase and the labour share of production labour decreases. But top income inequality has also increased in other economies, most notably in the US, so it is surprising why the UK would be different in this aspect.

(5) **Technological change**. An obvious explanation for the constant labour share is technological change. The labour share in equation (2) depends on the output elasticity α as well as on mark-ups, and if both increase proportionally, the ratio remains constant. However, there is no evidence of the rise in the output elasticity of labour in the US (or in other countries where people have estimated the production technology) that in addition is large enough to counteract the labour share (see De Loecker, Eeckhout and Unger, 2020). It would be a surprise if the UK economy were to employ a different technology from other countries. However, because technology differs across sectors, there could have been a change in the composition of sectors, which would lead to a different estimated aggregate technology.

(6) **(Mis)measured productivity**. One of the robust facts regarding the UK economy is that productivity has stagnated since the mid-2000s. Most authors, as well as the chapter by De Loecker et al. (2022), measure productivity either by labour productivity or by value added

per worker. In the presence of market power, both measures are biased. Productivity (or total factor productivity, TFP) 'may be taken to be some sort of measure of our ignorance'.[5] However, if we *know* that firms exert market power, then the productivity should be estimated under a different assumption than perfect competition.

De Loecker, Eeckhout and Mongey (2021) find that productivity measured through the lens of a model with market power is higher than under the assumption of perfect competition. Both measured productivity and value added matter for the labour share because the labour share depends on the wedge between measured productivity and labour compensation.

(7) **The effect of policy interventions on wages**. The UK has a markedly higher minimum wage than the US and one that has grown in real terms. Even if there is a downward pressure of market power on the equilibrium wage rate in the economy, this policy intervention may prevent a decline in the labour share. Because, under the minimum wage policy, the economy is out of equilibrium, this may have other implications for unemployment and labour force participation, but a binding minimum wage will drive up the labour share. Similarly, trade unionism is likely to lead to higher wages, even if firms have market power. But with waning union coverage, we would expect a labour share that is declining even more.

The welfare cost

Even if the labour share in the UK does not decline, market power can still cause a loss in output and a decline in welfare. Market power not only has a general equilibrium effect on wages, it also reduces labour force participation. Even if the market is competitive, with an upward-sloping aggregate labour supply, lower wages lead to a decline in labour force participation.

It is difficult to disentangle the direct effect of market power on the decline in labour force participation because many other factors affect participation.[6] Nonetheless, we find that labour force participation in the UK for males has declined, especially since the late 1980s, from 74\% to 68\% (see Figure 2). Even if the labour share in the UK has not fallen, there is a decline in welfare due to the decline in output as a result of the decline in labour force participation. If the total UK labour force had evolved like the male labour force and there was a representative firm, then a back-of-the-envelope calculation reveals that a 6\% decline in the labour force would have resulted in a 4\% reduction in output.[7]

Declining labour market dynamism

Firms with higher mark-ups not only have a lower labour share, but they also adjust their labour force less frequently (i.e. there is a decline in labour reallocation). Dominant firms can set higher prices because they face a residual demand elasticity that is lower than competitive firms. The lower elastic demand also implies that pass-through of productivity shocks is dampened. Now, in equilibrium, this leads to a decline in labour market dynamism: workers are promoted at a slower rate, and entry of young, labour-creating firms slows down. While dynamism has a positive aspect for workers because job security increases, there are also several negative effects. Unemployment duration increases due to lower dynamism, moving up the job ladder slows down

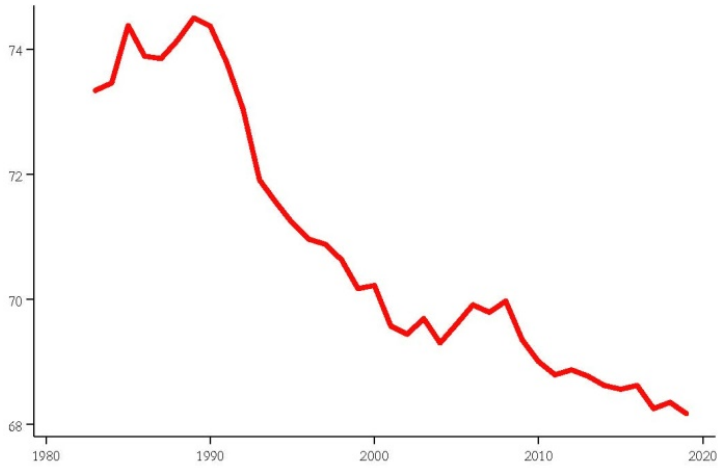
[5] See Abramovitz (1956, p. 11).

[6] Labour force participation depends on other factors than just wages. For example, female labour supply has increased steadily since World War II, and continues to increase to date, from 46\% in the early 1980s to 58\% now. This is the case in most advanced economies. In addition, labour supply also changes along the intensive margin and there is evidence that hours decrease at a constant rate with economic development (see, for example, Boppart and Krusell, 2020).

[7] Suppose we write output in a representative firm economy as $y = A\, l^{\alpha}\, k^{\beta}$. Assuming constant TFP, constant capital and an output elasticity of labour of 2/3, then $4\% = 1 - (1 - 0.06)^{2/3}$.

because job switching is slower, and it also leads to an increase in inequality. The utility gap between the unemployed and the employed increases, and the wage gap between the different rungs of the job ladder grows.

Figure 2. Labour force participation rate in UK, males



Inequality between workers

In addition to the split of output between profits and labour income, market power also affects labour income inequality between workers. I distinguish two routes through which market power affects between-worker inequality: profit sharing and monopsony.

Profit sharing

Market power tilts the split of output towards profits and away from wages. Now if the worker wage contains a share in profits, then wage inequality will in part be driven by profits. Therefore, an increase in market power leads to an increase in wage inequality. This is obviously the case for managers who are paid in stock options. Using US data, average executive compensation has increased, especially during the 1990s.[8] Also, there is a positive correlation between a firm's mark-up and the executive's pay, indicating that market power drives profits and hence also compensation. But this is true not only for managers – those in positions with responsibility and those who supervise other workers are often paid on performance and therefore share in the profits of the firm. Most likely, profit sharing, whether explicit or covert, also contributes to the rise in wage inequality in the UK. An increase in wage inequality is therefore directly driven by an increase in economy-wide market power.

Monopsony power

Beyond profit sharing and the overall decline in the wage level, market power in the goods has a direct effect not on wage inequality between workers as measured, but on the skill premium. This is because the mark-up affects the demand for all skills equally.[9] As a result, the skill premium is independent of the mark-up.

However, market power is not exclusive to the goods market. In the labour market, monopsony power (Robinson, 1933) arises when a firm with market power can affect the individual wages of

[8] See, for example, Gabaix and Landier (2008) and Terviö (2008). Also, Smith et al. (2019) show that, because of a tax loophole, professionals set up companies and declare as profits what really is labour income.

[9] The mark-up is proportional to the inverse of the goods demand elasticity (by the Lerner rule), and enters equally in the firm optimisation decision for the demand for all skills. There is the potential for a general equilibrium effect.

workers in the firm. This leads to a mark-down (equivalent to a mark-up) that drives a wedge between the worker's marginal revenue product and their wage. The higher the monopsony power, the higher the wage mark-down.

Interestingly, even if the level of the mark-down is high and firms do exert monopsony power, there is not much of an increase of total monopsony power despite the increase in market power of firms (see, for example, Lamadon, Mogstad and Setzler, 2019). But what is important for wage inequality is that monopsony power for high- and low-skilled workers is differential. The level of monopsony power is higher for the high-skilled than for the low-skilled – see Goolsbee and Syverson (2019) and Deb et al. (2021) – and, over time, monopsony power for the low-skilled has increased while that for the high-skilled has decreased. The rise in market power thus results in an increase in wage inequality.

Policy

With the rise of inequality driven by market power, there is now a role for policy not just to redistribute, but also to improve efficiency. Market power creates distortions and deadweight loss that, on grounds of the first welfare theorem, demand government intervention that is Pareto-improving. Inequality-reducing policies can thus also be efficiency-enhancing. Those policies can counter both wage stagnation and wage inequality between workers.

Policies that address inequality therefore need to tackle the rise of market power. The first-best policy option therefore is to address the causes of market power. Some of the causes stem from weak antitrust enforcement, but technological change and globalisation are at least as important drivers of the rise of market power (see De Loecker, Eeckhout and Mongey, 2021). Even in a first-best world, therefore, antitrust authorities face a delicate trade-off between maintaining the productivity gains from technological progress and reigning in the deadweight loss of the dominant firms. Breaking up firms is therefore not necessarily the best option. Instead, regulation such as interoperability maintain the advantages of scale economies but engender competition between firms operating with this technology that keeps the scale advantages.

Because the effects on wages and wage stagnation are economy-wide, general equilibrium effects, this poses serious legal challenges beyond current antitrust enforcement that addresses the effect of a firm's impact on the consumers of its goods. Because generalised market power has implications for the economy-wide wage, antitrust intervention needs to go beyond those directly affected by the firm's action, an externality. Antitrust legislation is currently not equipped to deal with these externalities that result in labour market inequality.

Finally, while income and profit taxation can help to correct some of the distortion acting as a Pigouvian tax as well as redistribute income (see Eeckhout et al., 2021), taxation of income and profit is unable to weed out the root cause of market power, which is necessary to achieve first best. This can only be achieved with antitrust policy and regulation.

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