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Nominal wage patterns, monopsony, and labour market power in early modern England

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Preindustrial English wage patterns have been obscured by the construction of real wage series, but strongly indicate a labour market where employers had much greater monopsony power than they do today.

We examine nominal wage patterns in preindustrial records and suggest that these wages indicate an imperfectly competitive labour market characterized by monopsony and employer power. We discuss the implications for the eighteenth-century British economy and research into long-run wages more generally.

Abstract

Records of long-eighteenth-century English wage rates exhibit almost absolute nominal rigidity over many decades, alongside significant dispersion between the wages paid by different organizations for the same type of work in the same location. These features of preindustrial wages have been obscured by data aggregation and the construction of real wage series, which introduce variation. In this paper, we argue that the standard explanations for wage rigidity in economic history are insufficient. We show econometric evidence for monopsony power in one major organization and argue that the main historical wage series are also affected by employer power. Eighteenth-century England had an imperfectly competitive labour market with large frictions. This gave large organizations the power to set wage policies. We discuss the implications for the eighteenth-century British economy and research into long-run wages more generally.

KEYWORDS

construction, eighteenth-century England, industrial revolution, labour markets, monopsony, wages, real wages

JEL CLASSIFICATION

J31, J41, K12, N33, N63, N83, J21, J22, J23

At the Royal Dockyards in the 1770s, a labourer assisting shipwrights received the same wage of one shilling and a penny per day that had been paid before the Restoration of the English monarchy in 1660.[1] To modern eyes, a nominal wage rate that holds for more than a century violates all our expectations about how wages behave. However, as the earliest archival wage historians knew, day-wage rates in the eighteenth century were extraordinarily rigid over long periods. Moreover, rigidity co-existed with significant and persistent gaps between the wages different employers paid for what was apparently the same kind of work in the same place.

These rigidities, visible during a period of structural change, modernization, preindustrial investment, technological innovation and economic growth, are a puzzling feature of eighteenth-century wage formation. Economic historians, from Thorold Rogers onwards, have noted them.[2] Even Adam Smith highlighted this characteristic of the labour market, commenting that 'customary rates' had not changed for half a century before he wrote *Wealth of Nations* in 1776.[3] And as we will see, in important parts of the labour market this extreme nominal wage rigidity persisted despite highly integrated markets for capital, goods, and services in the seventeenth and eighteenth centuries.[4]

Building on recent literature on modern labour markets, we argue that eighteenth-century nominal wage patterns provide evidence that economic historians should look beyond standard models of perfect competition to understand wage determination in early-modern labour markets. We suggest in the first part of the paper that the nominal wage rigidity that was such a distinctive feature of this period is an example of wage posting by employers. The ability of employers to operate a wage policy in which they post a non-negotiable wage offer was a consequence of the existence of labour market frictions. In the second part of the paper, we suggest that the use of wage policies in the eighteenth century can be explained within a framework of monopsonistic competition. We provide econometric evidence for monopsony in one large organization, and argue that several general features of the labour market help explain why large employers possessed monopsony power.

It is useful to be clear about what we mean by monopsony power. Monopsony describes labour markets in which employers have market power over their workers.[5] In a perfectly competitive market, the labour supply curve to the firm is infinitely elastic. In the traditional static model of monopsony, a single employer faces an upward-sloping labour supply curve and can choose a profit-maximizing level of employment and wage rate. When employers set wages that are distinct from the market wage of a perfectly competitive market, they are exercising some degree of monopsony power. Although most obvious in one-company towns, recent analyses of monopsony have argued that 'many—or even most—firms have some wage-setting power'.[6] This dynamic monopsony power arises from 'ignorance, heterogeneous preferences, and mobility costs', as Manning puts it.[7] Where multiple employers operating in the same labour market have some monopsony power, they operate in monopsonistic competition. A monopsonistic framework

[1] Richardson, *Wages of shipwrights*, pp. 265–7.

[2] See Rogers, *Agriculture and prices*, VII; Gilboy, *Wages*, pp. 23–8; Phelps Brown and Hopkins, 'Building wages', p. 202; Hutchins, 'Notes II', pp. 103–4; Schwarz, 'Standard', pp. 31–2; Boulton, 'Wage labour', pp. 274–6; Hatcher and Stephenson, *Seven centuries*, pp. 15–69; Woodward, 'Wage rates', p. 24.

[3] Smith, *Wealth of nations*, p.78. also see comments on pp. 83–4, quoted in Rule, *Experience of labour*, p. 69.

[4] Neal, 'International capital markets'.

[5] Our approach here relies on Manning, *Monopsony*. We define monopsony more formally in section IV.

[6] See, for example: Card, 'Who set?', p. 1.

[7] Manning, *Monopsony*, p. 5.

allows for the basic assumptions of supply and demand that economic historians have always relied on to remain operable, albeit with the implication that reported wages are 'set' by employers and may not be 'market wages'. We argue that monopsony offers a way to understand the nominal wage patterns we observe, and that it may also help us understand the long-run trajectory of wage growth and other developments in wage formation.

While we examine wages and employment in the long eighteenth century in England in this paper, we do not wish to suggest that monopsony is restricted to this period or place. We cannot say whether employers in the seventeenth or nineteenth centuries necessarily possessed more or less market power. Rather, we see wages in the long eighteenth century as both important in their own right, given the attention they have received in various debates, particularly about the causes of the Industrial Revolution, and as a good case study with which to discuss how the concept of monopsony can help us understand historical labour markets.[8] This is because we have 'good' data at an individual level from the organizations that supply most of the wage evidence used by generations of economic historians. Additionally, because the price index remained relatively flat over the long run in this period, some of the pressure on employers to adjust wages that is imposed by the biological lower-bound of viable incomes for workers is relaxed.

The paper begins with a discussion of the existing literature on wages and wage formation. In section II, we describe the evidence of nominal wage rigidity and wage dispersion for workers of the same skill over the period 1670–1775 and explain why these very remarkable nominal patterns of wages have largely been overlooked. In section III, we explore several potential explanations for nominal wage rigidity: stable prices generating stable nominal wages, currency and coinage, custom wages and wage stickiness. In section IV, we present evidence of monopsony at one important early modern employer by calculating separation elasticities to a measure of the real wage, as a case study. Section V discusses the potential sources of monopsony in eighteenth-century England. We conclude with a brief summary and discussion of the implications for future work on early modern labour markets.

I | LITERATURE

The study of wages in economic history originated in the nineteenth century. Initially, Thorold Rogers gathered vital wage observations over the centuries to examine workers' living standards and the causes of their 'degradation'.[9] However, it was Arthur Bowley who used the 'law of one wage' to justify the use of builders' wages to stand for the average working man's wage[10]:

> In spite of this apparent want of connection between the wages of one class of men and another there are very distinct causes which make the following law hold: – at the same time and in the same place the wages for equal effort of men of the same capacity are equal to one another; or more generally, the wages throughout the country of equal degrees of skill are equal at any given time.[11]

[8] See, in particular: Allen, *British industrial revolution*.

[9] Rogers, *Agriculture and prices*; idem, *Work and wages*, p. 7.

[10] Bowley, *Wages*, pp. 59–60.

[11] Bowley, *Wages*, p. 18.

Bowley's assumptions were essentially that the market for labour is perfectly competitive: equally productive workers can choose freely between comparable work with different employers across occupations and sectors. If this is so, employers are wage-takers and will hire workers up to the point where their marginal revenue product equals the market wage. Under these assumptions, any worker's wage rate is determined by the intersection of the supply and demand for labour. These market forces determine a single equilibrium wage for a skill level that represents wages in the market more generally.[12] Similar assumptions continue to underpin many uses of long-run average skilled or unskilled wage series.[13] Economic historians typically treat the wages paid to workers in construction or agricultural labouring as representative of the market wage for that level of skill, just as Bowley did, and England's reference series of wages have been a vital tool for economic historians over the years.[14] Yet recent work in modern labour economics has increasingly moved away from the baseline assumption that labour markets are reasonably competitive.

An important strand of work in labour economics argues that monopsony offers a more appropriate model. The notion of labour market monopsony and its implications were first set out by Joan Robinson in *The economics of imperfect competition* (1933), with the fundamental observation that the labour supply curve is not infinitely elastic to the wage and therefore wages do not always equal the marginal revenue product of labour.[15] Manning formalizes this into a dynamic model where employers can 'set wages' because both employers and workers face profound frictions in the market for work, disincentivizing job separations due to search costs, firm idiosyncrasies, and imperfect information.[16] In modern labour markets, monopsony is associated with the power of employers to suppress wages, owing to the size of firms, their concentration, coercive contracts, and labour's lack of outside options.[17]

The standard evidence for imperfect competition in labour markets is the dispersion of wages paid for the same work at the same time in the same location, but by different firms.[18] This is characterized more recently as the existence of 'rents' to employment.[19] Dispersion of wages for equally productive workers doing the same work across different employers indicates that labour markets are not fully integrated and that individual employers have some wage-setting power. Recent work has sought to classify this as monopsony by estimating the elasticity of the labour supply to wages through analysing the sensitivity of firms' separation rates or recruitment rates to wage changes.[20] Nominal wage patterns such as bunching in nominal wage rates or relative nominal wages between employers have also been interpreted as a sign of monopsony, demonstrating

[12] The clearest expression of this is: Clark and Van Der Werf, 'Work in progress?'.

[13] The key series for England are Clark, 'Condition of the working class'; idem, 'Macroeconomic aggregates'; Allen, 'Data-Wage and price history'.

[14] At the time of writing, Allen, 'The great divergence', has been cited more than 1500 times, and Clark, 'Condition of the working class', more than 600 times.

[15] Robinson, *Imperfect competition*, esp. pp. 243–92.

[16] Manning, *Monopsony*.

[17] Marinescu, 'Fighting monopsony', p. 55; Azar, Marinescu, and Steinbaum, 'Labour market concentration'.

[18] Classic studies include Reynolds, 'Wage differences'; Lester, 'Wage diversity'; Slichter, 'Structure of wages'. See: Manning, 'Imperfect competition', p. 1022; idem, *Monopsony*, pp. 3–10; Bhaskar, Manning and To, 'Oligopsony', pp. 155–7.

[19] See Jacobsen and Skillman, *Labor markets*, pp. 89–94; Boeri and Van Ours, *Labor markets*, p. 7.

[20] Langella and Manning, 'Measure', pp. 2931–50.

wage setting by employers.[21] Although empirically demanding, at least some of these approaches can be applied to historical data, as we demonstrate in section IV.

While the question of who set wages and how they did so in the eighteenth century has attracted attention in economic and social history, it has rarely directly intersected with this literature in economics.[22] There are important exceptions, such as Fishback's study of monopsony in a single-industry company town,[23] and Michael Huberman's seminal exploration of early industrializing Lancashire mills.[24] Several recent papers explore the effects of formal coercive institutions on employer power in premodern labour markets. Geloso, Kufenko, and Arsenault-Morin examine the monopsony power inherent in contracts formed under seignorial tenure in eighteenth- and nineteenth-century Quebec and show a large downward impact on wage rates.[25] Similarly, Gary, Jensen, Olsson, Radu, Severgnini, and Sharp show that the reintroduction of serfdom in eighteenth-century Denmark increased monopsony power, lowering unskilled agricultural wages substantially.[26] In a related vein, Delabatista and Rubens identify increasing monopsony in the Belgian coal industry after the creation of a formal cartel that engaged in collusive wage setting in 1897.[27] Our study complements these by examining monopsony in a labour market where employers lack an equivalently strong formal institutional advantage over their workers, although as we will see, they did not meet their workers as equals.

II | NOMINAL WAGE RIGIDITY AND DISPERSION

In the original sources that supply the great majority of wage observations for eighteenth-century England – day rates paid for building work – rigidity in the wage paid by any one employer over time, and dispersion between employers, is almost omnipresent.

Some of the most abundant detailed wage evidence from individual employers in this period survives from institutions in London, Europe's largest city and home to England's greatest concentration of manufacturing and commerce. At St Paul's Cathedral, the biggest construction site in the city for 35 years, monthly account books indicate that general labourers were (directly) paid the same nominal day rates from 1676 to 1748 – 16 d. per day in winter and 18 d. per day in summer, despite large changes in the number of labourers employed. Seven decades passed with just one brief wage adjustment: in the winter of 1676/7, the cathedral cut its rate to 14 d. per day from December to March. Wage adjustment was thus not impossible, but for some reason it was not repeated in the next three-quarters of a century.[28]

[21] Dube, Manning, and Naidu, 'Monopsony and employer', pp. 27–8; Bhaskar, Manning, and To, 'Oligopsony', pp. 158–62; Dube et al., 'Monopsony in online'; Falch, 'Elasticity of labour supply'; Staiger, Spetz, and Phibbs, 'Is there monopsony'; Datta 'Local market monopsony'.

[22] Scholliers and Schwarz, *Experiencing wages*; Hobsbawm, *Labouring men*, p. 344; Rule *Experience of labour*, pp. 194–201; Johnson, *Making the market*, pp. 90–101; Muldrew and King, 'Economy of makeshifts'.

[23] Fishback, *Soft coal, hard choices*, pp. 60–78.

[24] Huberman, *Escape*, esp. pp. xiii–xv, 1–14.

[25] Geloso, Kufenko, and Arsenault-Morin, 'Lesser shades'.

[26] Gary et al., 'Monopsony power and wages'.

[27] Delabastita and Rubens, 'Colluding'. Older works which discuss the ways in which economists have tested for monopsony include: Boal, 'Testing for employer monopsony'; Vedder et al., 'Discrimination and exploitation'; Naidu and Yuchtman, 'Labour market institutions'.

[28] London Metropolitan Archives (hereafter LMA), CLC/313/I/B/25473, ff. 35–76.

Likewise, at London Bridge, another major part of the city's infrastructure, the wage paid to workers maintaining the waterwheels under the bridge was the same for at least four decades from 1722.[29] As with St Paul's, the number of workers employed varied greatly, with some months when there was no work available. Yet the Bridgemaster rehired the same men on exactly the same wage with little trouble.[30] London Bridge's wages remained rigid in the face of significant market shocks. In the years after the Great Fire of London in 1666, when the demand for construction workers to rebuild the city provoked the relaxation of guild restrictions, the Bridge's rates for carpenters and masons remained exactly the same.[31]

The same story of wage rates remaining constant for decades can be found in series of labourers' wages drawn from the Tower of London, Greenwich Hospital, Bridge House, and Westminster Abbey.[32] Specific projects or skill requirements could sometimes lead to short-term variation in rates,[33] but in all these cases, the wage rate for a unit of worker input – a day or a tide – was generally rigid for decades. Interestingly, these large English employers tended to set uniform wages for broad skill levels, whereas similar evidence from Madrid and Rome shows more wage variation between grades of skill.[34]

Figure 1 brings together the main nominal wage series for building labourers in London working for organizations whose records allow us to observe rates over time.[35] Outside the Royal Dockyards, discussed below, there is no evidence that they were accompanied by in kind payments or perquisites. Wages varied by persistent amounts between locations, despite all these sites being within an hour's walk of each other. These data clearly show both long stretches of nominal rigidity and persistent dispersion in nominal wages. These appear to have been equivalent unskilled labouring roles, ameliorating as best as possible any concerns that this dispersion is because of differences in the effort or skill involved.[36]

Where did this rigidity come from? The evidence suggests that nominal wages were rigid because they were set by employers. The records from St Paul's and Bridge House indicate that they operated wage policies, where wages were determined by administrative proceedings. The reports of the meetings of the Commissioners for the Rebuilding of St Paul's discuss the wages they would pay for labour hired directly and for subcontractors. For instance, in March 1685 the Commissioners reviewed the costs of materials and wage rates they paid so that they could better inform contracts, and in 1710 they investigated the working carpenters' day rates they set.[37] At Bridge House, there was a major investigation in 1708 into wages paid to and by the tide carpenter

[29] Stephenson, *Contracts and pay*, chapter 7.

[30] The unit of pay was the tide. We do not know how long a 'tide' was, but we do know that the rates for tides were unchanged from 1722 to 1765.

[31] LMA, CLA/007/FN/003/19a–24. The Fire Acts (18 & 19 cha. II, *c.* 7) expressly opened up the London market to 'foreign' (non-guild) labour and precluded craftsmen from withholding labour for higher rates.

[32] For sources, see note to fig. 1. The pattern found at Westminster Abbey is consistent with a different team of masons hired for specialist works on a specific contract; see: Westminster Abbey Muniments 34513.

[33] See Stephenson, *Contracts and pay*, ch. 8; Stephenson, 'Working days'. Smaller firms and subcontractors seem to have more flexible wage policies.

[34] García-Zúñiga and López Losa, 'Skills and human capital', pp. 693–4; Rota and Weisdorf, 'Italy', pp. 941–3.

[35] A complete replication package including data and code is available on openICPSR at https://doi.org/10.3886/E198145V1.

[36] The possibility remains that some of these differentials in wages are because of differences in working conditions or retribution. We cannot observe these factors in the data, but note that these dimensions would have needed to remain unchanged over many decades for these differentials to persist.

[37] Bolton and Hendry, *Sixteenth volume*, pp. 33, 139.

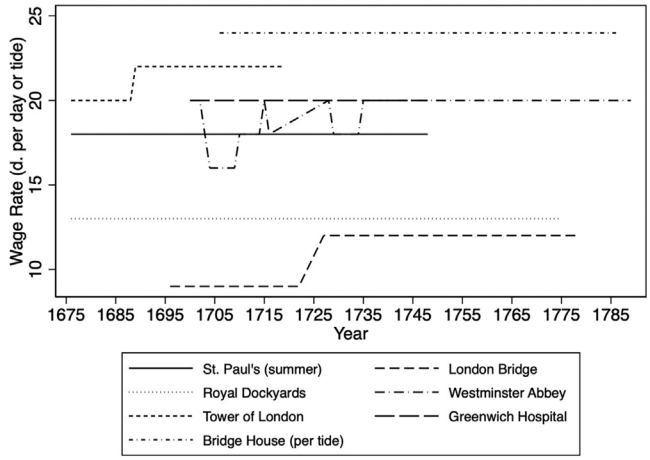

FIGURE 1 Nominal wage rates for labourers at London sites. *Note*: All wage rates are pence per day except for Bridge House, which is given in pence per tide. *Sources*: St Paul's: LMA, CLC/313/I/B/003/25473, 10–43. London Bridge: LMA, CLA/007/FN/04/001-7. Westminster: Gilboy, *Wages*, pp.254, 258. Westminster Abbey Muniments 34513. Royal Dockyards: Richardson, 'Wages of Shipwrights'; The National Archives (hereafter TNA), ADM 102. Greenwich: Gilboy, *Wages*; TNA, ADM 68/4. Tower of London: Hutchins, 'Notes'; TNA, WORK 5. Bridge House: LMA, CLA/007/FN/04/001-7.

at Bridge House, which went so far as to call witnesses to report on how much each member of the tide carpenter's team got in relation to their worth.[38]

This approach to setting wages appears commonplace among large institutional employers where records survive. Another example is the Navy Board, the body responsible for managing the supply of ships to the Royal Navy, which defined both the prices and wages it would pay ex ante. The rigidity of the wages that they set in the Royal Dockyards is perhaps the most extreme case known.[39] The Board set dockyard wages in 1650, and the same rates were in place in 1774. In the intervening 124 years, there was an extended debate over the workers' right to take 'chips', or good construction timber, that could be sold for cash or utilized on other jobs. As a result, the case is often cited as evidence that perquisites could compensate for the lack of wage growth. However, that should not obscure the absolute rigidity of the time and task-based payments. Perquisites could not compensate for the large variation in demand, and it is unlikely that chips were equally available to all workers.[40] Wage differentials with nearby private shipyards appear to have been persistent, failing to equalize with wages at the Royal Yards for decades.[41] When the Board imposed piece rates in 1774, the shipwrights struck, but alternative workers were found within days, and hired at new rates which the Board saw as advantageous.[42] Employer wage setting appears to have been accepted as a matter of course in many other areas, too. As a final example, porters' rates were set by the Corporation of London in 1646 and remained unchanged until 1712, after which they were fixed until the 1760s.[43]

[38] LMA, CLA/007/AD/01/007.

[39] Baugh, *Naval administration*, chapter 7.

[40] TNA, ADM 102; Richardson, *Wages of shipwrights*, pp. 265–4; Knight, 'Impressment'; Haas, 'Introduction', p. 45.

[41] Baugh, *Naval administration*, p. 322; Haas, 'Introduction', p. 45.

[42] Dobson, *Masters and journeymen*, p. 107.

[43] Llewellyn Smith, 'Waterside labour', pp. 595–7.

Historians have long noticed the rigidity and dispersion of eighteenth-century wages. The foundational source for English preindustrial wage rates and prices, Rogers' seven volume *History of agriculture and prices*, highlights the rigidity of nominal wages over the 11 or 12 decades following the end of the English Civil War.[44] Rogers' recording of wages in the year 1707 shows day-wage dispersion of up to 50 per cent between employers in London alone for the same kind of work.[45] Although published a century later, Boulton's London wage series makes the same point.[46] A 'striking stability' in rates was noted by Gilboy in her seminal work on eighteenth-century wages.[47]

That the wages we are discussing relate to a short-list of Britain's most famous religious and secular buildings is not chance. The construction sites for which good nominal wage records survive were unusually large and long-running building and maintenance projects. The Royal Dockyards were equally idiosyncratic, as the nation's largest state-owned defence manufacturer. The scale, management, financing, and duration of these sites meant they needed distinctive bureaucratic governance structures. One result of this was the creation and retention of serial payment records.[48]

Many of the wages included in construction wage series were not paid directly to workers, but were rates that contractors charged to their clients. A margin was then taken before the workmen were paid.[49] Although fragmentary, surviving records of payments by contractors to workers demonstrate similar rigidities.[50] These records give us some confidence that nominal rigidity was also a characteristic of the wages workers actually received.[51]

Wage rigidity was not limited to London's labour market. It is observed in smaller-scale urban projects elsewhere in England. Woodward's classic studies of early modern construction workers in Northern England found nominal wages that 'remained unchanged for years, often for decades'.[52] Areas with higher and lower wages co-existed within the region despite the opportunity for labour to move.[53] Wide variations between English counties in wage rates for the same work were also noted by Arthur Young.[54] Similarly, Eccleston identified a 'bewildering complexity of local wage bargains' in five industrializing midland counties between 1750 and 1788. He observed 'marked differences … in wages paid in parts of the country separated by comparatively short distances', and great rigidity in wage rates.[55] Similar rigidities appear in wages outside England, too, with nominal rigidity a feature of the wages paid to workers on Madrid's Royal Palace.[56]

[44] Rogers, *Agriculture and prices*.

[45] Rates from 13 d. to 20 d.: Rogers, *Agriculture and prices*, VII, pp. 615–7.

[46] Boulton, 'Wage labour', pp. 276–7.

[47] Gilboy, *Wages*, pp. 27, 254–70.

[48] These characteristics may mean that these institutions did not recruit in the same way as smaller enterprises. However, they are the key sources used in wage series: Woodward, *Men at work*.

[49] Stephenson, 'Real wages?', p. 106.

[50] TNA, C106/145; Stephenson, '"Real wages?"', p. 120.

[51] Stephenson, *Contracts and pay*, chapter 6.

[52] Woodward, 'Wage rates', p. 22. Slow wage convergence between north and south implies changes were somewhat more frequent in the north.

[53] Ibid. pp. 23, 28–46; also see Woodward, *Men at work*, pp. 190, 206, 250–87.

[54] Young, *Six months*, analysed in Botham, 'Working class living standards', pp. 22, 40–107.

[55] Eccleston, 'Wage rates', p. 91, note 2, 3, pp. 223, 245; Botham and Hunt, 'Wages in Britain'.

[56] García-Zúñiga and López Losa, 'Skills and human capital', pp. 698–701.

Not all forms of labour remuneration show the same features. For example, London's tailors notoriously turned from paying their workers day rates to piece rates to cut the cost of labour after 1747.[57] The fragmentary evidence that survives on piece rates indicates that, while in some sectors they were rigid, in others they varied more often. In both cases, they were set by employers. In one unusually detailed case, the piece rates paid to eighteenth-century spinners varied according to supply and demand, but they did so because the putting-out merchant set them at a fixed proportion of the par price, thus protecting himself from gluts in periods of low demand. In contrast, the same merchant fixed weavers' piece rates, but this meant that weavers bore the risk from changes in the costs of their inputs.[58] More recently, Humphries and Schneider find that the masters who employed spinners had leverage over their employees, and that putting-out merchants acted as a 'monopsonistic cartel'.[59]

Why have these nominal wage patterns been neglected? Since the 'standard of living debate,' the majority of academic debate, literature, and scholarship has been primarily concerned with real wages.[60] To generate real wages, nominal wages are divided by a weighted basket of consumable goods.[61] Because of their construction and inputs, real wages vary, appearing almost like modern average wage figures. Some variation arises from aggregation and averaging, as the nominal wages are usually either simple averages of wage data taken directly from a range of institutional records, or estimates from regression models fitted to samples of wages by region, year, occupation, and other factors.[62] More significantly, changes in prices for the basket of consumable goods introduce volatility into real wage series.[63] For example, figure 2 illustrates how the movements of Clark's influential real wage index are driven primarily by changes in the cost of living, while his nominal wages, in this case estimated by regression, fluctuate less. In short, the field's attention to real wages has overshadowed the striking rigidity and dispersion that characterizes recorded nominal wages in this period.

Two phenomena that are often seen as indicators of imperfect competition were present in the eighteenth-century labour market: nominal wages were rigid over the long run and there was persistent dispersion in wages for the same kind of work in the same local labour market. Large employers were 'wage posting', a method of wage determination where the employer picks a wage and hires who they can, rather than striking bargains with individual workers.[64] After considering some other possible explanations for these patterns, we will argue that they can be explained usefully within a framework of monopsonistic competition.

[57] Galton, *Selected documents*, p. 9.

[58] Burley, 'An Essex clothier', pp. 293–4. See also: Burley, 'Labour dispute', pp. 222–3; Grassby, 'Rate of profit'.

[59] Humphries and Schneider, 'Spinning the industrial revolution'.

[60] Some recent exceptions that deal with average or estimated nominal wages include: Gary and Olson, 'Men at work', pp. 120–121; Chambru and Maneuvrier-Hervieu, 'Evolution'.

[61] On day rates and the nominal wage, see: Stephenson, '"Real" wages?', pp. 106–10, 125–7; eadem, 'Mistaken wages', especially pp. 755, 763, 766 and n. 68. For the basket and methods, see: Allen, 'Great divergence'; Clark, 'Condition of the working class'; idem, 'Long march'.

[62] Clark, 'Long march', pp. 101–3.

[63] An excellent survey is: Feinstein, 'Pessimism perpetuated', pp. 626–31. Price fluctuations also affect Humphries and Weisdorf's recent estimates of wage rates from annual wages, which include the cost of the subsistence bundle received: 'Unreal wages'.

[64] Manning, 'Imperfect competition', pp. 991–7. For evidence on posting historically: Paker, Stephenson, and Wallis, 'Job Tenure'; Stephenson, *Contracts and pay*, chapters 6, 8.

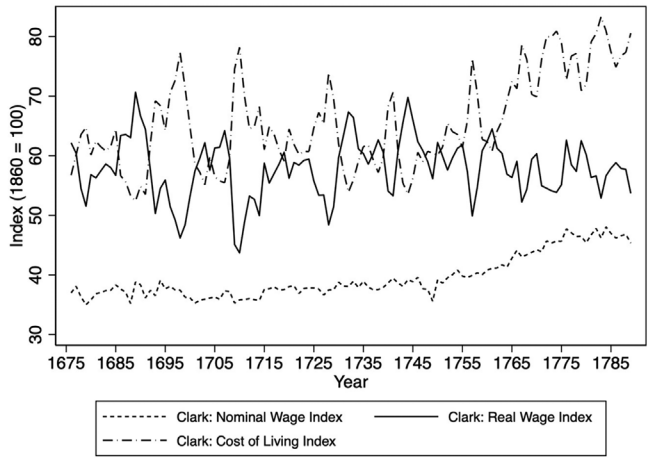

FIGURE 2 Real wage, cost of living, and nominal wage indices for building labourers. *Sources*: See text.

III | EXISTING EXPLANATIONS FOR NOMINAL WAGE RATE RIGIDITY

Nominal wages have been neglected, but they have not been entirely ignored. In this section, we examine four arguments that might appear to explain nominal wage rigidity: stable prices, currency constraints, customary norms, and wage stickiness.

III.I | Rigidity, Prices and Wages

The level of nominal wage rigidity at individual employers over the long eighteenth century stretches credulity to modern eyes that are used to seeing wages adjust to supply and demand, productivity and prices. In this section, we discuss the most obvious potential explanation that could reconcile these wages with a competitive labour market: price stability. Were wages so stable because of stable prices?

At first glance, price stability might seem to offer a viable explanation. In fact, this is the explanation offered by García-Zúñiga and López Losa in their important recent discussion of wage stickiness in Madrid in this period.[65] The long-terms trends in historical price indices for England were indeed flat: prices in the 1740s were comparable to those in the 1660s. However, these long-run trends conceal much short- and medium-term volatility. For instance, wheat was 30 s. per bushel in 1676, but in 1678 cost over 52 s. per bushel, an increase of almost 75 per cent in 2 years. Even a smoothed 5-year annual moving average of wheat prices, given in figure 3, shows significant fluctuations. The 1690s are well known as a sharply inflationary decade with much hardship, but even in the first decade of the 1700s, when prices were generally falling, there were shocks of 20 percent or more in the price of wheat.[66] As Gilboy put it, 'One would

[65] García-Zúñiga and López Losa, 'Skills and human capital', pp. 705–6. They explicitly draw on Boulton's argument that price movements explain London wage movements in the sixteenth and seventeenth centuries: Boulton, 'Wage labour', pp. 283–4.

[66] Waddell, 'Economic crisis', esp. pp. 283, 288, 289.

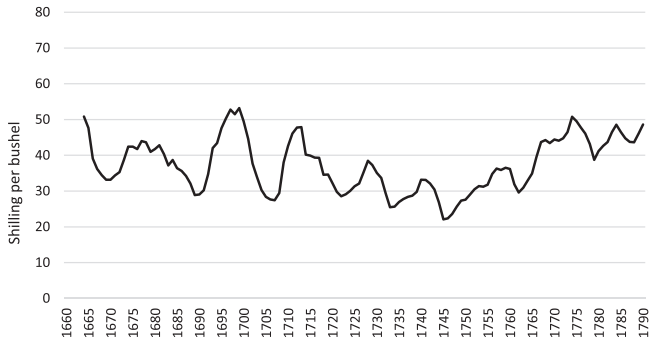

FIGURE 3 Wheat prices, 5-year moving average. *Source*: Allen, 'Data-Wage and Price History'.

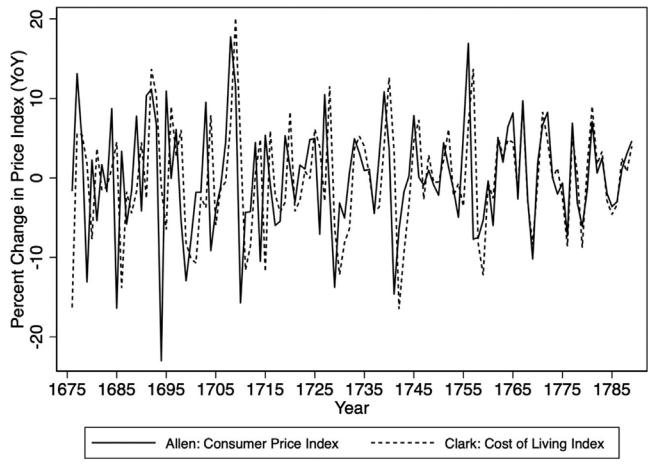

FIGURE 4 London inflation rate. *Note*: The figure reports the year-on-year CPI percent change. *Sources*: Allen, 'Data-Wage and price history'; Clark, 'Long march'.

expect some greater variation of prices than wages, but such an extreme variation is amazing at first'.[67]

The volatility of the price of an individual commodity, even one as important as wheat, might largely disappear when absorbed into a wider measure of the price level. The two most robust and thoroughly researched price series were constructed by Clark and Allen.[68] Both are designed to identify long-run trends, and, as a result, use annual or quinquennial averages. Even so, they are highly volatile, as figure 4 shows. Despite a level trend, year-on-year the price indices move sharply up and down, sometimes by up to 15 per cent annually.

To put this in context, the most memorable recent historical example of price volatility in the UK was the 'Great Inflation' of the 1970s, when the inflation rate hit 15 per cent per annum.[69]

[67] Gilboy, *Wages*, p. 23.

[68] Clark, 'Macroeconomic aggregates'; Allen https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/.

[69] Before 2022–3: DeLong, 'America's peacetime inflation', p. 248.

Though the 1970s are associated with unsustainable and painful wage bargaining, nominal wages generally rose somewhat to meet inflation.[70] In contrast, eighteenth-century nominal wages and inflation appear entirely unrelated. Figure 5 plots the relationship between Allen's consumer price index and the nominal wage series described earlier. We report them by institution to avoid compositional effects on the wage. In all cases, prices are far more volatile than wages and there is essentially no discernible relationship between the two.

As a simple test of these relationships, we calculated Pearson correlation coefficients between the growth in the consumer price index and wages. In series with complete nominal wage rigidity there can be no correlation. Even in the series with some wage variation, the correlation is very near to zero – 0.039 for Westminster Abbey and 0.145 for the Tower of London.

In this period, employers and representatives of the local and national state, such as overseers of the poor and justices of the peace, did understand that wages must respond to prices if workers were to maintain themselves.[71] Yet while eighteenth-century prices were extremely volatile, wages remained nominally rigid. Nominal wage rigidity was thus not due to price stability.[72] Instead, short-run real wages rose and fell significantly, causing large fluctuations in workers' purchasing power.

III.II | Currency, Monetization, and Wages

Financial and social historians have long highlighted the poor state of England's currency in the seventeenth and eighteenth centuries. The coin supply had a significant impact on economic activity.[73] Lucassen argues the coin supply can directly affect wages: because cash wages can only be paid in the money that is physically available, an economy needs small coins in circulation for wages to adjust at fine increments, preventing rigidities.[74] Similarly, Muldrew has argued that the scarcity of small money in early modern England had a profound influence on the form of the wage. As he notes, daily wage rates in the seventeenth century were commonly set at increments that varied by 2 d., suggesting that available coin denominations determined the minimum viable adjustment between wage levels. For example, in St Paul's Cathedral, labourers were paid 16 d. or 18 d. per day, but never 17 d. This phenomenon is similar to bunching observed in wages today.[75] Although the English minted coins as small as a quarter of a penny, these were notoriously scarce until the introduction of token coinage in 1821.[76]

Coinage might, therefore, offer a way to explain why nominal wages fail to adjust frequently within a competitive labour market. Simply put, changes in nominal wages were restricted to the steps determined by the currency that was available. The unit of work that was measured by

[70] Wachter, 'The wage process', pp. 507–10; downward wage rigidity then became the predominant concern as inflation slowed.

[71] Boulton, 'Food prices', p. 474. Also: Boulton, 'Wage labour', pp. 283–4; idem, 'Meaner sort'.

[72] A close reading of García-Zúñiga and López Losa's analysis suggests it is close to ours in practice, as they highlight the role of institutional interventions (bread price controls) and the lack of major labour disputes as explanations for wage stickiness in Madrid after 1760, and they also show that wages were set as a policy by the employer (the crown): 'Skills and human capital', pp. 706, 708.

[73] Mayhew, 'Prices in England'.

[74] Lucassen, 'Introduction'; Lucassen and Zuijderduijn, 'Coins, currencies'; Lucassen, *Work*, pp. 115–17.

[75] See: Dube et al., 'Monopsony in online'.

[76] Redish, 'Evolution of the gold standard'.

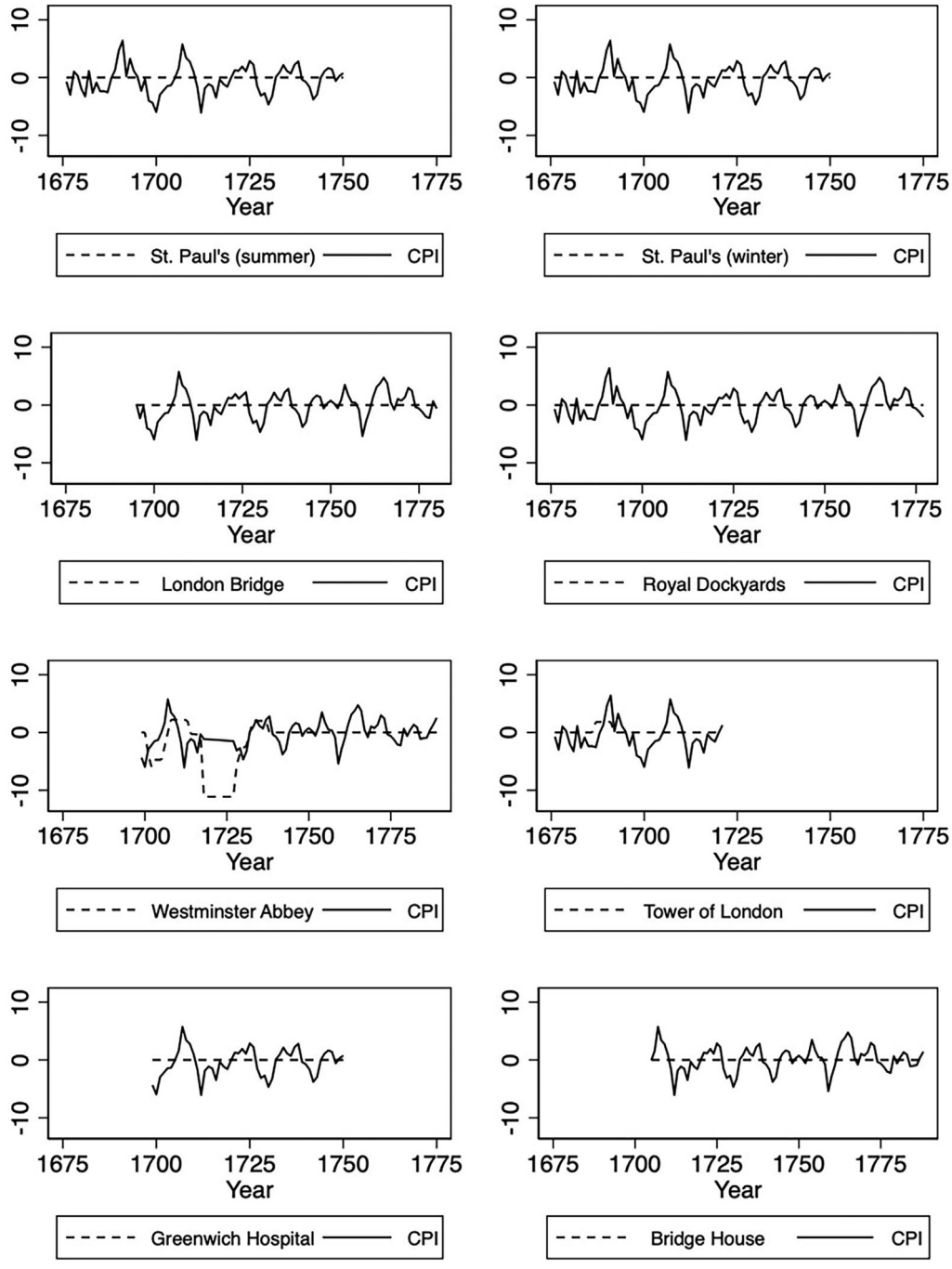

FIGURE 5 Wages and inflation in London. *Sources*: See figure 1. CPI is from Allen, 'Data-Wage and price history'. Note that all series are presented as the 5-year moving average of year-on-year growth.

employers was also constrained by their administrative capacity: eighteenth-century wage records for both agricultural and construction work use the day as the unit of account. Half-days are sometimes reported, but not hourly work. A 2 d. increment equated to 10–16 per cent of the average nominal unskilled day wage. If the smallest possible increase would lift employers' wage bills by over 10 per cent, it is easy to see why changes in pay might be rare.

However, while coinage was surely one source of friction, currency constraints do not provide a convincing explanation for long-run nominal wage rigidity. Firstly, employers were still capable of making adjustments.[77] When employers did make changes, they were predominantly 'bunched' at 2 d. amounts, but this bunching did not completely preclude adjustment. Secondly, although the coin supply of early modern England was constrained, the mint was not the only source of currency.[78] It has been suggested that early modern England was a place where 'private money predominated'.[79] There was widespread minting of and use of trade tokens by businesses. Tokens were issued in units of account as large as 5 d. and as small as a farthing.[80] By minting their own currency, employers could escape the large steps between available coins.[81] Thirdly, the use of credit and truck mitigated the impact of the coin supply. The majority of manufacturing and service workers were not paid on each day they were hired. Instead, they were paid in larger sums in arrears.[82] In the construction industry, most day labourers were paid at weekly intervals.[83] At the extreme, workers at the Royal Dockyards were paid quarterly, one quarter in arrears.[84] Only a small minority of those employed worked for shorter amounts of time that would have required employers to pay in small coins.

Finally, the coin supply was not entirely fixed during the years in which we observe nominal wage rigidity. According to Palma, the coin stock increased by roughly 50 per cent after the first decade of the eighteenth century. After a further period of stability, it increased sharply from the late 1750s.[85] In short, the coin supply constraint was far less binding than it may have initially appeared and cannot satisfactorily explain the long-run day-rate rigidities we find.

III.III | Custom Wages

As Woodward said, '"custom" has always been regarded as an extremely useful concept by economic and social historians since it can be invoked whenever other explanations appear inadequate'.[86] Custom, in the sense of shared norms, fulfils an important function in the working of any labour market, where accepted rates or wage differentials provide information that reduce

[77] Evident in figure 1; see also: Stephenson, 'Working days', p. 416.

[78] Palma, 'Reconstruction of money supply', p. 373.

[79] Lucassen and Zuijderduijn, 'Coins, currencies', p. 12.

[80] Whiting, *Trade tokens*.

[81] Hundreds of tokens were issued by commercial private enterprises throughout the seventeenth and eighteenth centuries. These tokens were accepted as exchangeable for goods by local government: Boyne and Williamson, *Trade tokens* pp. xxiii–xxvi; Mathias and Barrington Brown, *English trade tokens*; Mayhew, 'Population'; Sargent and Velde, *Big problem*, pp. 261–90.

[82] Waddell, 'Economic crisis'.

[83] Stephenson, *Contracts and pay*, chapter 6.

[84] Richardson, *Wages of shipwrights*, p. 269.

[85] Palma, 'Reconstruction of money supply'.

[86] Woodward, 'Wage rates', p. 36.

the need for haggling. Economists and historians all generally acknowledge a place for custom, perhaps in the guise of a 'sociological aspect', in the setting of wages.[87]

However, a stronger notion, that before industrialization wages were determined in a 'moral economy' centred on reciprocity within communities, 'not a market calculation', can be found in a number of studies.[88] In a significant essay on custom and wages, Schwarz noted that the 'money wage was responsive to changing conditions', but stressed that the money wage was only one part of remuneration, that most of the wage was 'paid in credit or in kind.'[89] As evidenced above, this former point was generally not the case in the wages economic historians have largely used, which are cash wages, mainly without payment in-kind. Few historians have identified exactly how custom affected nominal wages. The honourable exception is Woodward, who explicitly equated custom with Keynesian wage stickiness, suggesting that the failure of wages to fall 'may be explained in part at least, by the force of the custom forged during earlier centuries'.[90]

Rather than a norm that governed nominal wages, custom is better understood as a resource workers used in disputes over conditions, even if most references involve the principle being violated.[91] Interestingly, Thompson, whose work is most closely associated with popularizing the idea of a moral economy, saw the importance of custom in the eighteenth century in disputes over expectations, attitudes, and practices around work, not in wage setting.[92] 'Custom' was frequently invoked by those who argued for improved welfare for workers, especially after 1760. Indeed, the word became much more commonly used from the mid-eighteenth century.[93] Rule suggests that 'customary expectation' peaked in the early nineteenth century, when nominal wages were changing regularly, and as such, it seems a weak explanation for the earlier period of rigid wages.[94]

For custom to offer a meaningful explanation for rigid wages, it should define a rate for a role that holds beyond a specific site or employer. That wages for similar work varied between similar sites should be enough to dispel the idea that workers and employers shared an understanding of a customary wage that was generally applicable throughout the labour market, even if social norms did play a role in wage setting. As Hatton describes for a later period, at most custom provided an ordered framework for wage setting, rather than a direct determination of the nominal rate.[95]

III.IV | Wage Stickiness

Nominal wage rigidity is closely associated with downward wage stickiness, as employers opt not to cut wages during downturns or demand slumps. [96] Keynes believed this was to avoid labour

[87] Piore, 'Sociological theory', pp. 377–8.

[88] Hobsbawm, *Labouring men*, p. 344 (quote); Schwarz, 'Custom, wages and workload', pp. 154–5.

[89] Schwarz, 'Custom, wages and workload', pp. 171, 191–2. The relationship between custom and credit is explored in: Muldrew, *Economy of obligation*; Muldrew and King, 'Economy of makeshifts'; Johnson, *Making the market*, pp. 89–110.

[90] Woodward, 'Wage rates', pp. 37–8; see also Huberman, *Escape*.

[91] On the limits of custom, see Schwarz, 'Custom, wages and workload', p. 155.

[92] Thompson, *Customs in common*, chapter 1, esp p. 5; Rule, *Experience of labour*, p. 194.

[93] An ngram view search for the word, 'custom' in English language publications between 1650 and 2019 shows an almost sevenfold increase in the use of the word between 1712 and 1800, and a decline after that https://books.google.com/ngrams/graph?content=custom&year_start=1650&year_end=2019&corpus=en-2019&smoothing=3.

[94] Rule, *Experience of labour*, pp. 194–5.

[95] Hatton, 'Institutional change and wage rigidity, pp. 84–5.

[96] For example, Solow, 'Wage stickiness'.

unrest, writing that 'a movement by employers to revise money-wage [nominal] bargains downward will be much more strongly resisted than a gradual and automatic lowering of real wages as a result of rising prices'.[97] It is still often explained today as arising from a desire for employers to appear fair or to prevent worker action.

In the late nineteenth-century U.S. manufacturing sector, fear of worker action was associated with downward nominal wage rigidity.[98] It seems unlikely that this would have applied in England in the eighteenth century. As we discuss later, labour's power was limited. Additionally, the eighteenth-century employers whose wages are used by economic historians did not experience the same constraints on renegotiating the terms of employment as the modern firms that are usually considered in the Keynesian framework. Modern firms often hire labour on rolling or long-term contracts and may face unionized workers.[99] In contrast, these eighteenth-century employers hired labour casually, usually by the day or week. This should have afforded them more opportunities to adjust wages in response to changing conditions, yet we do not observe this.

It is also important to note that Keynesian price and wage stickiness is typically taken to be a short-to-medium term phenomenon, not something that persists for many decades.[100] Additionally, Keynesian wage stickiness is asymmetric: it cannot provide a satisfactory theoretical explanation for the upward nominal wage rigidity which we also observe. That feature points to this being a result of employers' ability to set wage policies because of their monopsony power.[101]

IV | ESTIMATES OF MONOPSONY

The wage rigidity and dispersion we observe in the London labour market were the proximate result of employers setting wages. Employers having the power to set wages is commonly associated with monopsony in labour economics. Having addressed some potential explanations, in this section we present empirical evidence for monopsony at one site, St Paul's Cathedral, which is a major source in historical wage series.

The method we apply builds on the standard idea that the degree of monopsony power is given by the elasticity of the labour supply curve facing the firm. Langella and Manning discuss the challenges of measuring this using today's labour market data.[102] While the difficulties involved in using historical data are even more considerable, the worker-level data available from St Paul's for 1676–1748 allow us to generate estimates of the elasticity of the labour supply curve to this site.

In a perfectly competitive labour market, it is assumed that an individual firm is a wage-taker and chooses the level of employment that maximizes profit, where marginal revenues equal marginal costs. The labour supply curve to the firm under perfect competition should be

[97] Keynes, *The General Theory*, Collected Writings VII, p. 264.

[98] Hanes, 'The development of nominal wage rigidity'; Kaur, 'Nominal wage rigidity'.

[99] We acknowledge that precarious contracts are becoming more prevalent: Bell and Blanchflower, 'Underemployment'; Standing, 'Precariat'.

[100] Wage and price 'spells' of rigidity are typically estimated for modern markets to last under a year in length; for recent estimates for the UK, for example, see Dixon and Tian, 'What we can learn'.

[101] While Keynesian wage stickiness does not seem to be driving the nominal wage patterns we observe, we cannot rule out that it may be contributing to it. The failure of wages to be lowered during slack labour markets we attribute in the next section to turnover reduction strategies could also be explained by Keynesian stickiness driven by 'custom' or employers' concerns with fairness, even with labourers' low bargaining power.

[102] Langella and Manning, 'Measure', pp. 2931–7, esp. pp. 2935–6.

perfectly elastic, indicating that a firm will not be able to hire any workers if they offer a wage even one penny less than the going market wage. At the other end of the spectrum, when job search is costly, workers cannot pit firms fully into competition which confers firms some monopsony power. This enables firms to pay workers lower than their marginal productivity, gaining profit.

The monopsonistic firm decides to pay a wage w which determines the labour supply to the firm $L^s(w)$. w is chosen to maximize their profit

$$\prod(w) = F[L^s(w)] - wL^s(w),$$

where $F(L)$ is a concave and increasing production function. The first order condition for profit maximization is

$$F'\left(L^M\right) = w^M\left(1 + \frac{1}{\epsilon_w^L}\right),$$

where ϵ_w^L is the elasticity of the labour supply curve to the firm with respect to the wage. The marginal cost of hiring a worker is thus greater than the marginal revenue product owing to the positive labour supply elasticity, causing workers' remuneration w^M to be less than their marginal product. The wage is given by $w_M = \frac{F'(L^M)\epsilon_w^L}{1+\epsilon_w^L}$. Under conditions of perfect competition where the elasticity of the labour supply to the firm is perfectly elastic, then $\epsilon_w^L = \infty$ and the wage equals the marginal revenue product. The degree of monopsony power is captured by $\epsilon_w^L < \infty$, where workers are paid $\frac{\epsilon_w^L}{1+\epsilon_w^L}$ of their marginal revenue product. The level of employment is determined by the labour supply at w^M, which is typically lower than the level of employment at the competitive wage. The monopsonist's problem is to choose a wage that allows them to hire the workers they need to produce a level of output at minimal cost.

This static model is difficult to estimate directly because the marginal revenue product is not easily observed.[103] Many papers thus operationalize the result from the dynamic turnover-based model in Manning that the elasticity of the labour supply to the firm can be written

$$\epsilon_w^L = \epsilon_w^R - \epsilon_w^S = -2\epsilon_w^S,$$

where ϵ_w^R is the recruitment elasticity and ϵ_w^S is the separation rate elasticity.[104] The elasticity of the labour supply to the firm can therefore be estimated by generating an estimate of the wage elasticity of separations.

We follow the existing literature in estimating the wage elasticity of separations using a logit model.[105] We estimate the probability of a worker separating from St Paul's from accounting year $t-1$ to t as

$$\Pr(S_i = 1 \mid X) = \Lambda(\beta_0 + \beta_1 w_i + \beta_2 tenure_i + \tau_t)$$

[103] See Langella and Manning, 'Measure'.

[104] Manning, *Monopsony*, p. 97. For applications, see, for example Ransom and Sims, 'Estimating'; Booth and Katic, 'Estimating'; Depew and Sørensen, 'Elasticity'; Ransom and Oaxaca, 'New market power models'.

[105] Sokolova and Sorensen summarize possible approaches to estimating this: 'Monopsony'.

TABLE 1 Elasticity of separations and elasticity of the labour supply to the firm.

	Whole sample		Sample w/average wage 14–18	
	Final sep. only (1)	Final and temp sep. (2)	Final sep. only (3)	Final and temp sep. (4)
Elasticity of separations				
No controls	−0.979***	−0.901***	−0.770**	−0.698**
Tenure year controls	−0.788**	−0.809**	−0.801*	−0.814**
Decade fixed effects and tenure year controls	−1.599***	−1.449***	−1.788***	−1.569***
N	2464	2464	2406	2406
% $S = 1$	37.22%	40.58%	37.28%	40.73%
Elasticity of labour supply to the firm				
No controls	1.959	1.803	1.540	1.396
Tenure year controls	1.576	1.619	1.601	1.629
Decade fixed effects and tenure year controls	3.198	2.899	3.576	3.138

Source: See text.

where S is in indicator that equals 1 if the worker separated from St Paul's, w_i is the average wage for the worker in the year, $tenure_i$ is the average years of tenure of the worker in the year, τ_t are decadal fixed effects and Λ is the cumulative distribution function of the standard logistic distribution. We compute the full elasticity of separations to wages and multiply it by −2 to generate an estimate of the elasticity of the labour supply to the firm.[106]

The results are presented in table 1. We present models with and without tenure controls because whether tenure should be included is a matter of debate.[107] Estimates of the wage elasticity of separations might be biased because of the endogeneity of wages and employment. Though this is less of a concern with individual data, some researchers have instrumented for wages to address this potential endogeneity.[108] We are less concerned about endogeneity in this setting given the extreme nominal wage rigidity observed, where most of the variation in real wages is driven by plausibly exogenous fluctuations in the price level rather than changes in employment.

Columns (1) and (2) in table 1 use the full sample of 2464 annual worker observations, while columns (3) and (4) are estimated only for those workers with an annual average daily wage between 14 d. and 18 d. inclusive. This excludes 58 year-worker observations, typically cases in which a worker was acting as a foreman. Columns (1) and (3) capture only the final separation of the worker – whether they left St Paul's from year t–1 to t never to appear in the rolls again. Columns (2) and (4) use a more inclusive definition of separation that also includes temporary separations from the Cathedral of more than a year.

The wage elasticity of separations is multiplied by −2 to generate an estimate of the elasticity of the labour supply to the firm. In all the specifications, this elasticity of the labour supply to the firm is estimated to be between 1.5 and 3.6. These low estimates of the elasticity of the labour supply to the firm indicate that St Paul's had considerable monopsony power. These estimates suggest

[106] Manning, *Monopsony*.

[107] See Bachmann, Demir, and Frings, 'Labor market', p. S19; Hirsch, Jahn, and Schnabel, 'Do employers'.

[108] For example, Ransom and Sims, 'Estimating'.

that workers at St Paul's were paid only 0.60–0.78 of their marginal product. These estimates are much lower than the average estimate of the labour supply elasticity presented in the landmark meta-analysis of 53 modern studies by Sokolova and Sorensen of 7.13.[109] This is strong evidence that St Paul's had monopsony power.

The finding that St Paul's had monopsony power is consistent with other evidence that it was pursuing a turnover reduction strategy.[110] In the Burdett and Mortensen model, firms with monopsony power choose wages to minimize hiring and firing costs in situations where information is costly.[111] Monopsonists can therefore choose wages to reduce separations and increase tenure, as noted by Manning.[112] Evidence from St Paul's Cathedral suggests this was the case for unskilled workers at the site in the eighteenth century. Unskilled labourers who had a longer 'career' at the Cathedral were rewarded with a higher number of days of work and access to other income earning opportunities, despite the fixed wage. This managed turnover costs by creating implicit contracts with long-standing employees.[113] Stephenson has also found fragmentary evidence for a relationship between tenure and the number of days worked for more skilled workers.[114] If employers were pursuing such a policy, it offers an explanation for why employers did not save on labour costs by using their market power to cut day rates in times of low demand, high labour supply, or falling prices.

Keeping in mind the ambiguity of the concept of a 'job' during this period, the evidence that jobs had rents in the early modern period also supports a monopsonistic interpretation of labour markets.

V | THE SOURCES OF MONOPSONY POWER

The empirical exercise we presented in the previous section is restricted to one organization. However, the wage policy St Paul's followed was indistinguishable from those of other similar large employers, judging by their nominal wage patterns and the evidence of employer behaviour. We therefore look for the sources of monopsony power in the wider setting of eighteenth-century London, not the specifics of St Paul's Cathedral. In this section we ask: what gave large employers the power to set wages in eighteenth-century London?

Monopsony power arises in the first instance from labour market frictions. In labour markets with significant frictions, including bargaining costs, moving costs, and information asymmetries, employers may pursue wage strategies to manage their labour force and reduce costs.[115] London construction appears to have been an imperfectly competitive labour market, where unskilled labour operated in an uncertain, casual market subject to high transaction costs, resulting in high turnover costs for employers and costly information asymmetries.[116]

[109] Sokolova and Sorensen, 'Monopsony'.

[110] Paker, Stephenson, and Wallis, 'Job tenure'.

[111] Burdett and Mortensen, 'Wage differentials'.

[112] Manning, *Monopsony*, p. 103.

[113] Paker, Stephenson, and Wallis, 'Job tenure'.

[114] Stephenson, 'Working days', pp. 422–5; Webber, 'Firm market power'.

[115] Card, 'Who set your wage?', pp. 1079, 1083–4; Oi and Idson, 'Firm size', pp. 2167–9.

[116] Pollard, 'Labour in Great Britain'; Grantham, 'Economic history'; Wallis, 'Labour markets and training'.

Employment within this setting was also affected by the institutional setting. Unlike serfdom and feudal tenure studied in other recent literature, English employers' coercive power was an aspect of unequal contract enforcement mechanisms.[117] A significant literature in economic and social history stresses the role of coercion in early modern and preindustrial labour markets.[118] While in the nineteenth century, unionization institutionalized worker bargaining power,[119] in the long eighteenth century labour had few rights and virtually no bargaining power. Since the mid-sixteenth century, justices of the peace had the power to set maximum wages. The greatest burden was on workers who had entered contracts that ran over an extended time period, such as a year. Workers in contracts who disputed wages or went on strike faced an immediate risk of trial and incarceration.[120] Under the law, employers also risked fines or imprisonment if they increased wages in response to disputes.[121] Legal provisions gave employers the power to coerce workers and undermined the bargaining power of organized labour. It is clear this power was used and held wages down.[122] After the labour law was revised in 1875, disputes and separations increased, and so did wages.[123]

Despite the law, labour did organize and it did strike. 'Combinations' of journeymen and workers were active, but weak.[124] To approximately measure worker's bargaining power in this period, we digitized and analysed the industrial and trade disputes collected by Dobson, who tracked all those recorded in England 1717–1800 in newspaper and court sources.[125]

The number of disputes each year provides a rough measure of labour unrest, and by implication, gives some indication of the strength of workers' bargaining power. However, this analysis is limited by the lack of information on the number of workers affected by each dispute.

Figure 6 gives the number of industrial and trade disputes each year, as well as the number of disputes where the principal issues was wages. Even though most disputes were about wages, there were relatively few industrial disputes recorded until the late 1760s. By our analysis, Dobson identified fewer than ten disputes per year in most of the period in which we observe nominal wage rigidity.[126] This confirms the view that workers had relatively little bargaining power.

Overall, in this period, the combination of labour market frictions and the political and legal framework meant that the balance of power was tilted forcibly away from workers. The labourers who were hired by the day at St Paul's and similar construction sites in London had greater bargaining power than English workers in service contracts, as they possessed the freedom to withdraw their labour the next day if they chose. Both had, in turn, greater power than labourers

[117] Comparators include Geloso, Kufenko, and Arsenault-Morin, 'Lesser shades'; Gary et al., 'Monopsony, power and wages'.

[118] See Rogers, *Work and wages*, pp. 173–87; Hay, 'England, 1562–1875'; Thompson, *Making*; Steinfeld, *Coercion*. Recent discussions of coercion and labour in other pre-modern settings include Chambru and Maneuvrier-Hervieu, 'Evolution', pp. 921–2; Gary and Olson, 'Men at work', p. 115.

[119] Thompson, *Making*; Joyce, *Visions of the people*, pp. 115–20.

[120] 5 Eliz. c.4. See: Woodward, 'Statute of Artificers', p. 33.

[121] Kelsall, *Wage regulation*, p. 121.

[122] Rogers, *Work and wages*, p. 66; Hay, 'Master and servant'; Steinberg, 'Capitalist development'; Steinfeld, *Coercion*, p. 42, n. 14.

[123] Naidu and Yuchtman, 'Coercive contract enforcement' p. 109.

[124] Chase, *Early trade unionism*, ch. 2.

[125] Dobson, *Masters and journeymen*.

[126] In most cases, substitute labour was hired so employers' losses from stoppages were not substantial.

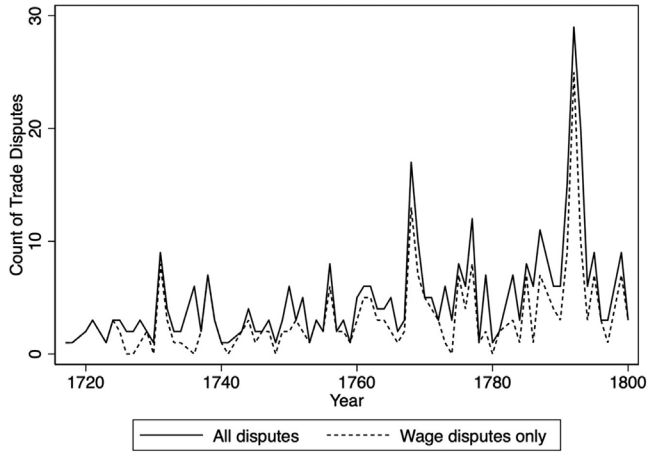

FIGURE 6 Reported industrial and trade disputes, 1717–1800. *Note*: Data from Dobson, *Masters and journeymen*, digitized by authors.

living under feudalism or seigneurial tenure, where the freedom of workers to move to different labour markets is constrained even outside of a contract.[127] Nonetheless, they were prevented from organizing legally or bargaining collectively. This imbalance explains employers' ability to set wages and exercise a measure of monopsony power.

VI | CONCLUSION

We observe substantial nominal wage rigidity over decades at large employers in the eighteenth century, as well as dispersion in wage rates for similar work across sites. Large employers explicitly pursued wage policies that can be observed in their records. We provide evidence of the low elasticity of the labour supply to wages at one significant employer. Taking into account the historical evidence of low labour power and significant labour market frictions, as well as the insufficiencies of other possible explanatory narratives, we argue that the most plausible explanation for these nominal wage patterns is that they arose from imperfect competition that gave employers monopsony power. Wages were not bargained nor were they the result of well-functioning competitive markets. Rather, the almost absolute rigidity that characterized nominal wages in the eighteenth century was because large employers 'set' wages under conditions in which they had substantial monopsonistic market power. Eighteenth-century employers derived their market power from two sources: first, the natural monopsony that labour market frictions and firm idiosyncrasies created, and second, a legal or institutional framework that limited workers' bargaining power. This has implications not only for the sites for which we have data, but also for our understanding more generally of the structure and operation of early modern labour markets.

Manning says that a monopsonistic perspective on labour markets 'does not mean supplanting all existing competitive analysis: in many cases, it simply adds to it'.[128] In this spirit, we suggest that

[127] Geloso, Kufenko, and Arsenault-Morin, 'Lesser shades'; Gary et al., 'Monopsony power and wages'.

[128] Manning, *Monopsony*, pp. 27, 362.

a monopsonistic framework may contribute to understanding several important puzzles about historical labour markets, allowing us to examine old anomalies in new ways. For example, the competitive framework has never been able to answer the question of why nominal wages did not move with the costs of living during the long eighteenth century.[129] If wage determination was the result of wage policies where monopsonistic employers with market power set wages, these patterns may become more explicable, at least at the large institutions for which data survive.

By emphasizing the costs of search and rents in the employment relationship, a monopsonistic framework also has broader implications for economic historians' conceptions of wages, skill premiums, and employment contracts. Monopsony implies that the wage data underlying the craftsmen's and labourers' wage series that so much economic history stands on may not necessarily be representative of the average wage nor the average worker's marginal product.[130] Future research may need to estimate or otherwise account for the effect of monopsony on wage rates.

Monopsony also offers a complement to human capital theory in analysing the reasons for wage differentials. Research on contemporary labour markets finds that markets for unskilled labour are more monopsonistic, with employers having more power, than those for skilled workers.[131] This has implications for conceptions of the 'skill premium' as the result of investment in human capital or guild rents.[132] A portion of the skill premium may have been the product of differences in bargaining power and labour supply elasticities. Monopsony could also help understand the heterogeneity of returns to human capital and training, particularly for women and children, if the labour supply of these groups to individual firms was less elastic than others, and they had relatively little labour power.[133]

Further, a monopsonistic framework can shed new light on the costs and incentives of different wage contracts, such as the difference between annual service contracts and casual day labouring. If differences in employer power affected workers' decision to submit to a long contract, this needs to be explicitly modelled when we consider the relationship between the wages in annual service contracts and those for day work. Indeed, the elasticity of the labour supply to wages may have varied between these two distinct forms of the employment relationship, and whether labour supply was added at the extensive or intensive margins would be critically affected by the level of monopsony.

Economists today are starting to 'take questions about wage setting seriously'.[134] Recent research has linked monopsony with employer coercion, attempting to highlight moral and economic exploitation in labour markets where 'superstar firms' enjoy market power, allowing them to keep wages below marginal product.[135] By examining historical wage policies and contracts with a new lens of monopsony, we place some of these questions around freedom and coercion in labour contracts into historical perspective. We also contribute to the growing evidence that monopsony is not just a characteristic of modern labour markets but has many historical antecedents.

[129] Broadberry, Campbell, and Overton, *British economic growth*, fig. 6.01, p. 251.

[130] Chambru and Maneuvrier-Hervieu suggest that wages series from construction sector are fairly representative of wage trends in the other sectors of the economy (textile, agriculture, etc.) in eighteenth-century Normandy: 'Evolution'.

[131] Manning, 'Imperfect competition', pp. 994–6.

[132] Van Zanden, 'Skill premium'.

[133] Manning, 'Imperfect competition', pp. 1026–7.

[134] Card, 'Who set'.

[135] Azar, Marinescu, and Steinbaum, 'Labour market concentration'; Dippel, Greif, and Trefler, 'Outside options'.

More work needs to be done to understand many things about preindustrial labour markets. An important question arises as to the extent to which labour markets became more or less 'competitive' during industrialization and development, one which touches on many grand theories about industrialization and capitalism over the last two centuries. In the meantime, understanding the role of monopsony in early modern labour markets offers us the chance to construct new explanations for the problem of how capital and labour shared the gains from production in the long run.

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REFERENCES

Abel, W., Tenreyro, S. and Thwaites, G., 'Monopsony in the UK', CEPR Discussion Papers, no. 13265 (2018).
Akerlof, G. A., 'Labour contracts as partial gift exchange', *Quarterly Journal of Economics*, 97 (1982), pp. 543–569.
Allen, R. C., 'The great divergence in European wages and prices from the Middle Ages to the First World War', *Explorations in Economic History*, 38 (2001), pp. 411–447.
Allen, R. C., 'Data—Wage and Price History', https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages (accessed: 10 February 2012).
Allen, R. C., *The British industrial revolution in global perspective* (Cambridge, 2009).
Allen, R. C. and Weisdorf, J. L., 'Was there an industrious revolution before the industrial revolution? An empirical exercise for England, c.1300–1830', *Economic History Review*, 64 (2011), pp. 715–729.
Azar, J., Marinescu, I. and Steinbaum, M., 'Labour market concentration', *Journal of Human Resources*, 57 (2022), pp. S167–S199.
Bachmann, R., Demir, G. and Frings, H., 'Labor market polarization, job tasks, and monopsony power', *Journal of Human Resources*, 57 (S) (2022), pp. S11–S49.
Baugh, D. A., *British naval administration in the age of Walpole* (Princeton, 2015).
Bell, D. N. and Blanchflower, D. G., 'Underemployment in the US and Europe', National Bureau of Economic Research, Working paper W24927 (2018).
Berg, M., Hudson, P. and Sonenscher, M., 'Introduction', in M. Berg, P. Hudson and M. Sonenscher, eds., *Manufacture in town and country before the factory* (Cambridge, 2002), pp. 1–32.
Bhaskar, V., Manning, A. and To, T., 'Oligopsony and monopsonistic competition in labour markets', *Journal of Economic Perspectives*, 16 (2002), pp. 156–174.
Boeri, T. and Ours, J. V., *The economics of imperfect labor markets*, 2nd edn. (Princeton, 2014).
Boal, W. M., 'Testing for employer monopsony in turn-of-the-century coal mining', *Rand Journal of Economics*, 26 (1995), pp. 519–536.

Boal, W. M. and Ransom, M. R., 'Monopsony in the labour market', *Journal of Economic Literature*, 35 (1997), pp. 86–112.
Bolton, A. T. and Hendry, H. D., eds., *The sixteenth volume of the Wren society* (Oxford, 1939).
Booth, A. and Katic, P., 'Estimating the wage elasticity of labour supply to a firm: what evidence is there for monopsony?', *Economic Record*, 87 (2011), pp. 359–369.
Botham, F. W., 'Working class living standards in North Staffordshire, 1750–1914', unpub. PhD thesis, Univ. of London (1982).
Botham, F. W. and Hunt, E. H., 'Wages in Britain during the industrial revolution', *Economic History Review*, 2nd ser., XL (1987), pp. 380–399.
Boulton, J., 'Wage labour in seventeenth-century London', *Economic History Review*, XLIX (1996), pp. 268–290.
Boulton, J., 'Food prices and the standard of living in London in the "century of revolution", 1580–1700', *Economic History Review*, LIII (2000), pp. 455–492.
Boulton, J., 'The "meaner sort": labouring people and the poor', in K. Wrightson, ed., *A social history of England, c.1500–c.1750* (Cambridge, 2017), pp. 310–329.
Bowley, A. L., *Wages in the United Kingdom in the nineteenth century: notes for the use of students of social and economic questions* (Cambridge, 1900).
Boyne, W. and Williamson, G. C., *Trade tokens issued in the seventeenth century in England, Wales and Ireland, by corporations, merchants, tradesmen, etc.*, vol. 2, new and rev. edn. (London, 1891).
Broadberry, S. N., Campbell, B. M, Klein A., Overton, M. and van Leeuwen, B., *British economic growth: 1270–1870* (Cambridge, 2010).
Burdett, K. and Mortensen, D. T., 'Wage differentials, employer size, and unemployment', *International Economic Review*, 39 (1998), pp. 257–273.
Burley, K. H., 'A note on a labour dispute in early eighteenth-century Colchester', *Historical Research*, 29 (1956), pp. 220–230.
Burley, K. H., 'An Essex clothier of the eighteenth century', *Economic History Review*, 2nd ser., XI (1958), pp. 289–301.
Burnette, J., *Gender, work and wages in industrial revolution Britain* (Cambridge, 2008).
Card, D., 'Who set your wage?', *American Economic Review*, 112 (2022), pp. 1075–90.
Chambru, C. and Maneuvrier-Hervieu, P., 'The evolution of wages in early modern Normandy (1600–1850)', *Economic History Review*, 76 (2023), pp. 917–940.
Chase, M., *Early trade unionism: fraternity, skill and the politics of labour* (Aldershot, 2017).
Clark, G., 'The price history of English agriculture', 1209–1914', *Research in Economic History* (2004), pp. 41–123.
Clark, G., 'The condition of the working class in England, 1209–2004', *Journal of Political Economy*, 113 (2005), pp. 1307–1340.
Clark, G., 'The long march of history: farm wages, population, and economic growth, England 1209–1869', *Economic History Review*, 60 (2007), pp. 97–135.
Clark, G., 'The macroeconomic aggregates for England, 1209–2008', *Research in Economic History*, 27 (2010), pp. 51–140.
Clark, G. and Van Der Werf, Y., 'Work in progress? The industrious revolution', *Journal of Economic History*, 58 (1998), pp. 830–843.
Clark, J. B., 'Wages and interest as determined by marginal productivity', *Journal of Political Economy*, 10 (1901), pp. 105–109.
Crafts, N., 'Understanding productivity growth in the industrial revolution', *Economic History Review*, 74 (2021), pp. 309–338.
Datta, N., 'Local market monopsony', unpublished paper at LSE CEP labour market workshop (2 November 2020).
Delabastita, V. and Rubens, M., 'Colluding against workers', SSRN Paper 4208173 (2 November 2022), https://doi.org/10.2139/ssrn.4208173
DeLong, J. B.., 'America's peacetime inflation: the 1970s', in C. D. Romer and D. H. Romer, eds., *Reducing inflation: motivation and strategy* (Chicago, 1997), pp. 247–280.
Depew, B. and Sørensen, T., 'The elasticity of labor supply to the firm over the business cycle', *Labour economics* 24 (2013), pp. 196–204.
Dippel, C, Greif, A. and Trefler, D., 'Outside options, coercion, and wages: removing the sugar coating', *Economic Journal*, 130 (2020), pp. 1678–1714.

Dixon, H. and Tian, K., 'What we can learn about the behaviour of firms from the average monthly frequency of price-changes: an application to the UK CPI data', *Oxford Bulletin of Economics and Statistics*, 79 (2017), pp. 907–932.

Dobson, C. R., *Masters and journeymen: a prehistory of industrial relations, 1717–1800* (London, 1980).

Dube, A., Jacobs, J., Naidu, S. and Suri, S., 'Monopsony in online labour markets', *American Economic Review: insights*, 2 (2020), pp. 33–46.

Dube, A., Manning, A. and Naidu, S., 'Monopsony and employer mis-optimization explain why wages bunch at round numbers', National Bureau of Economic Research, W24991 (2018).

Eccleston, B., 'A survey of wage rates in five Midland Counties, 1750–1834', unpub. PhD. Thesis, Univ. Leicester (1976).

Falch, T., 'The elasticity of labour supply at the establishment level', *Journal of Labour Economics*, 28 (2010), pp. 237–266.

Feinstein, C. H., 'Pessimism perpetuated: real wages and the standard of living in Britain during and after the industrial revolution', *Journal of Economic History*, 58 (1998), pp. 625–658.

Fishback, P. V., *Soft coal, hard choices: the economic welfare of bituminous coal miners, 1890–1930* (New York, 1992).

Galton, F. W., *Select documents illustrating the history of trade unionism: 1. The tailoring trades* (London, 1896).

García-Zúñiga, M. and López Losa, E., 'Skills and human capital in eighteenth-century Spain: wages and working lives in the construction of the royal palace of Madrid (1737–1805)', *Economic History Review*, 74 (2021), pp. 691–720.

Gary, K., Jensen, P. S., Olsson, M., Radu, C. V., Severgnini, B. and Sharp, P., 'Monopsony power and wages: evidence from the introduction of serfdom in Denmark', *Economic Journal*, 132 (2022), pp. 2835–2872.

Gary, K. E. and Olsson, M., 'Men at work. Wages and industriousness in southern Sweden 1500–1850', *Scandinavian Economic History Review*, 68:2 (2020), pp. 112–128.

Geloso, V., Kufenko, V. and Arsenault-Morin, A. P., 'The lesser shades of labor coercion: the impact of seigneurial tenure in nineteenth-century Quebec', *Journal of Development Economics*, 163 (2023), 103091.

Gilboy, E. W., *Wages in eighteenth century England* (Cambridge, MA, 1934).

Grantham, G., 'Economic history and the history of labour markets', in G. Grantham and M. MacKinnon, eds. *Labour market evolution: the economic history of market integration, wage flexibility and the employment relation* (London, 2002), pp. 1–26.

Grassby, R., 'The rate of profit in seventeenth-century England', *English Historical Review*, 84 (1969), pp. 721–751.

Haas, J. M., 'The introduction of task work into the royal dockyards, 1775', *Journal of British Studies*, 8 (1969), pp. 44–68.

Haley, J., 'Theoretical foundations for sticky wages', *Journal of Economic Surveys*, 4 (1990), pp. 115–155.

Hanes, C.., 'The development of nominal wage rigidity in the late 19th century', *American Economic Review*, 83 (1993), pp. 732–756.

Hatcher, J. and Stephenson, J. Z., eds., *Seven centuries of unreal wages* (London, 2018).

Hatton, T. J., 'Institutional change and wage rigidity in the UK, 1880–1985', *Oxford Review of Economic Policy*, 4 (1988), pp. 74–86.

Hay, D., 'Master and servant in England: using the law in the 18th and 19th centuries', in W. Steinmetz, ed., *Private law and social inequality in the industrial age: comparing legal cultures in Britain, France, Germany, and the United States* (Oxford, 2000), pp. 227–264.

Hay, D., 'England, 1562–1875: the law and its uses', in D. Hay and P. Craven, eds., *Masters, servants, and magistrates in Britain and the Empire, 1562–1955* (Chapel Hill, 2004), pp. 59–116.

Hicks, J., *The theory of wages* (London, 1932).

Hirsch, B., Jahn, E. J. and Schnabel, C., 'Do employers have more monopsony power in slack labor markets?', *Industrial and Labor Relations Review*, 71 (2018), pp. 676–704.

Hobsbawm E. J., *Labouring men: studies in the history of labour* (London, 1968).

Huberman, M., *Escape from the market: negotiating work in Lancashire* (Cambridge, 1996).

Humphries, J., 'Respectable standards of living: the alternative lens of maintenance costs, Britain 1270–1860', LSE, Department of Economic History Working Paper, 323 (2023).

Humphries, J. and Schneider, B., 'Spinning the industrial revolution', *Economic History Review*, 72 (2019), pp. 126–155.

Humphries, J. and Weisdorf, J., 'Unreal wages? Real income and economic growth in England, 1260–1850', *Economic Journal*, 129, (2019), pp. 2867–2887.
Hunt, E. H., *Regional wage variations in Britain 1850–1914* (Oxford, 1973).
Hunt, E. H., 'Industrialization and regional inequality: wages in Britain, 1760–1914', *Journal of Economic History*, 46 (1986), pp. 935–966.
Hutchins, B. L., 'Notes towards the history of London wages [I]', *Economic Journal*, 9 (1899), pp. 599–605.
Hutchins, B. L., 'Notes towards the history of London wages [II],' *Economic Journal*, 10 (1900), pp. 103–104.
Jacobsen, J. and Skillman, G., *Labor markets and employment relationships: a comprehensive approach*, 2nd edn. (Oxford, 2008).
Johnson, P., *Making the market: Victorian origins of corporate capitalism* (Cambridge, 2010).
Joyce, P., *Visions of the people: industrial England and the question of class, c.1848–1914* (Cambridge, 1994).
Kaur, S., 'Nominal wage rigidity in village labour markets', *American Economic Review*, 109 (2019), pp. 3585–3616.
Kelsall, R., *Wage regulation under the Statute of Artificers* (London, 1938).
Keynes, J. M., *The general theory, collected writings VII*, 4th edn. (Cambridge, 2015).
Knight, R., 'From impressment to task work: strikes and disruption in the royal dockyards 1688–1788', in K. Lunn and A. Day, eds., *History of work and labour relations in the Royal Dockyards* (London, 1999), pp. 1–20.
Langella M. and Manning A., 'Marshall Lecture 2020: the measure of monopsony', *Journal of European Economic Association*, 19 (2021), pp. 2929–2957.
Lester, R. A., 'Wage diversity and its theoretical implications', *Review of Economic Statistics*, 28 (1946), pp. 152–159.
Llewellyn Smith, H., 'Chapters in the history of London waterside labour', *Economic Journal*, 2 (1892), pp. 593–607.
Lucassen, J., 'Introduction', in J. Lucassen, ed., *Wages and currency: global comparisons from antiquity to the twentieth century* (Bern, 2007).
Lucassen, J., *The story of work: a new history of humankind* (New Haven, 2021).
Lucassen, J. and Zuijderduijn, J., 'Coins, currencies, and credit instruments. Media of exchange in economic and social history', *TSEG-The Low Countries Journal of Social and Economic History*, 11 (2014), pp. 1–14.
Manning, A., 'Labour markets with company wage policies', *Centre for Economic Performance*, LSE, No. DP0214 (1994).
Manning, A., *Monopsony in motion* (Princeton, 2003).
Manning, A., 'Imperfect competition in the labour market', in O. Ashenfelter and D. Card, eds., *Handbook of labour economics* (Amsterdam, 2011), pp. 973–1041.
Manning, A., 'Monopsony in labour markets: a review', *Industrial & Labor Relations Review*, 74 (2021), pp. 3–26.
Manning, A. and Petrongolo, B., 'Monopsony in local labour markets', in *IFS Deaton Review of Inequalities* (London, 2022).
Marinescu, I. E., 'Fighting monopsony', in S. Block and B. Harris, eds., *Inequality and the labour market: the case for greater competition* (Washington, 2021), pp. 55–66.
Mathias, P. and Barrington Brown, A. C., *English trade tokens: the Industrial Revolution illustrated* (London and New York, 1962).
Mayers, D. and Thaler R., 'Sticky wages and implicit contracts: a transactional approach', *Economic Inquiry*, 17 (1979), pp. 559–574.
Mayhew, N., 'Population, money supply, and the velocity of circulation in England, 1300–1700', *Economic History Review*, XLVIII (1995), pp. 238–257.
Mayhew, N. J., 'Prices in England, 1170–1750', *Past and Present*, 219 (2013), pp. 3–39.
Muldrew, C., *The economy of obligation: the culture of credit and social relations in early modern England* (Basingstoke, 1998).
Muldrew, C. and King, S., 'Cash, wages, and the economy of makeshifts in England, 1650–1800', in J. Hatcher and J. Stephenson, eds., *Seven centuries of unreal wages* (London, 2018), pp. 267–306.
Naidu, S. and Yuchtman, N., 'Coercive contract enforcement: law and the labour market in nineteenth century industrial Britain', *American Economic Review*, 103 (2013), pp. 107–144.
Naidu, S and Yuchtman, N., 'Labour market institutions in the gilded age of American economic history', National Bureau of Economic Research, Working Paper no. W22117 (2016).
Neal, L., 'Integration of international capital markets: quantitative evidence from the eighteenth to twentieth centuries', *Journal of Economic History*, 45 (1985), pp. 219–226.

Oi, W. Y. and Idson, T. L., 'Firm size and wages', in O. Ashenfelter and D. Card, eds., *Handbook of labour economics*, vol. 3 (Amsterdam, 1999), pp. 2165–2214.
Paker, M., Stephenson, J. and Wallis, P., 'Job tenure and unskilled workers before the industrial revolution: St Paul's Cathedral 1672–1748', *Journal of Economic History*, 83 (2023), pp. 1101–1137.
Palma, N., 'Reconstruction of money supply over the long run: the case of England, 1270–1870', *Economic History Review*, 71 (2018), pp. 373–392.
Phelps Brown, H. and Hopkins, S. V., 'Seven centuries of building wages', *Economica*, 22 (1955), pp. 195–206.
Phelps Brown, H. and Hopkins, S. V., 'Seven centuries of the prices of consumables, compared with builders' wage-rates', *Economica*, 23 (1956), pp. 296–314.
Piore, M. J., 'Fragments of a "sociological" theory of wages', *American Economic Review*, 63 (1973), pp. 377–384.
Pollard, S., 'Labour in Great Britain', in P. Mathias and M. M. Postan, eds., *The Cambridge economic history of Europe*, vol. 7 (Cambridge, 1978), pp. 97–179.
Ransom, M. and Oaxaca, R. L., 'New market power models and sex differences in pay', *Journal of Labor Economics*, 28 (2010), pp. 267–89.
Ransom, M. R. and Sims, D. P., 'Estimating the firm's labor supply curve in a "new monopsony" framework: schoolteachers in Missouri', *Journal of Labor Economics*, 28 (2010), pp. 331–355.
Redish, A., 'The evolution of the gold standard in England', *Journal of Economic History*, 50 (1990), pp. 789–805.
Reynolds, L. G., 'Wage differences in local labour markets', *American Economic Review*, 36 (1946), pp. 366–375.
Richardson, H. E., 'Wages of shipwrights in HM Dockyards, 1496–1788', *Mariner's Mirror*, 33 (1947), pp. 265–274.
Robinson, J., *The economics of imperfect competition* (London, 1933).
Rogers, T. E., *A history of agriculture and prices in England: 1259–1793*, 7 vols. (Oxford, 1866–1902).
Rogers, T.E., *Eight chapters on the history of work and wages* (London, 1891).
Rota, M. and Weisdorf, J., 'Italy and the little divergence in wages and prices: new data, new results', *Journal of Economic History*, 80 (2020), pp. 931–960.
Rule, J., *The experience of labour in eighteenth century English industry* (New York, 1981).
Salop, S. C., 'A model of the natural rate of unemployment', *American Economic Review*, 69 (1979), pp. 117–125.
Sargent, T. J. and Velde, F. R., *The big problem of small change* (Princeton, 2001).
Scholliers, P. and Schwarz, L. D., eds., *Experiencing wages: social and cultural aspects of wage forms in Europe since 1500* (New York, 2003).
Schwarz, L. D., 'The standard of living in the long run: London, 1700–1860', *Economic History Review*, 2nd ser., 38 (1985), pp. 24–36.
Schwarz, L. D., 'Custom, wages and workload in England during industrialization', *Past and Present*, 197 (2007), pp. 143–175.
Shapiro, C. and Stiglitz, J. E., 'Equilibrium unemployment as a worker discipline device', *American Economic Review*, 74 (1984), pp. 433–444.
Slichter, S. H., 'Notes on the structure of wages', *Review of Economics and Statistics*, 32 (1950), pp. 80–91.
Smith, A., *An inquiry into the nature and causes of the wealth of nations*, 2 vols (Oxford, 1869).
Sokolova, A. and Sorensen, T., 'Monopsony in labour markets: a meta-analysis', *Industrial and Labor Relations Review*, 74 (2021), pp. 27–55.
Solow, R. M., 'Another possible source of wage stickiness', *Journal of Macroeconomics*, 1 (1979), pp. 79–82.
Sonenscher, M., *Work and wages: natural law, politics and the eighteenth-century French trades* (Cambridge, 1989).
Staiger, D., Spetz, J. and Phibbs, C., 'Is there monopsony in the labour market? Evidence from a natural experiment', *Journal of Labour Economics*, 28 (2010), pp. 211–236.
Standing, G., 'The precariat: today's transformative class?', *Development*, 61 (2018), pp. 115–121.
Steinberg, M. W., 'Capitalist development, the labour process, and the law' *American Journal of Sociology*, 109 (2003), pp. 445–495.
Steinfeld, R. J., *Coercion, contract, and free labour in the nineteenth century* (Cambridge, 2001).
Stephenson, J. Z., '"Real" wages? Contractors, workers, and pay in London building trades, 1650–1800', *Economic History Review*, 71 (2018), pp. 106–132.
Stephenson, J. Z., 'Mistaken wages: the cost of labour in the early modern English economy, a reply to Robert C. Allen', *Economic History Review*, 72 (2019), pp. 755–769.
Stephenson, J. Z., *Contracts and pay: work in London construction 1660–1785* (London, 2020).

Stephenson, J. Z., 'Working days in a London construction team in the eighteenth century: evidence from St Paul's Cathedral', *Economic History Review*, 73 (2020), pp. 409–430.
Styles, J., 'Embezzlement, industry and the law in England, 1500–1800', inM. Berg, P. Hudson and M. Sonenscher, eds., *Manufacture in town and country before the factory* (Cambridge, 1983), pp. 173–205.
Thompson, E. P., *The making of the English working class*, new edn. (London, 1991).
Thompson, E. P., *Customs in common: studies in traditional popular culture* (London, 1993).
Van Zanden, J. L., 'The skill premium and the "Great Divergence"', *European Review of Economic History*, 13 (2009), pp. 121–153.
Vedder, R. K., Gallaway, L. E. and Klingaman, D., 'Discrimination and exploitation in antebellum American cotton textile manufacturing', *Research in Economic History*, 3 (1978), pp. 217–262.
Wachter, M., 'The wage process: an analysis of the early 1970s', *Brookings Papers on Economic Activity*, 3 (1974), pp. 507–525.
Waddell, B., 'The economic crisis of the 1690s in England', *Historical Journal*, 66 (2023), pp. 281–302.
Wallis, P., 'Labour markets and training', in R. Floud, J. Humphries and P. Johnson, eds., *Cambridge economic history of modern Britain* (Cambridge, 2014), pp. 178–210.
Wallis, P., Colson, J. and Chilosi, D., 'Structural change and economic growth in the British economy before the industrial revolution, 1500–1800', *Journal of Economic History*, 78 (2018), pp. 862–903.
Webber, D. A., 'Firm market power and the earnings distribution', IZA Discussion Papers, 7342 (2015).
Weiss, A., 'Job queues and layoffs in labour markets with flexible wages', *Journal of Political Economy*, 88 (1980), pp. 526–538.
Whiting, J. R. S., *Trade tokens: a social and economic history* (Newton Abbot, 1971).
Woodward, D., 'The background to the Statute of Artificers: the genesis of labour policy, 1558–63', *Economic History Review*, 2nd ser., 33 (1980), pp. 32–44.
Woodward, D., 'The determination of wage rates in the early modern north of England', *Economic History Review*, 47 (1994), pp. 22–43.
Woodward, D., *Men at work* (Cambridge, 1995).
Wrigley, E. A., 'Rickman revisited: the population growth rates of English counties in the early modern period', *Economic History Review*, 62 (2009), pp. 711–735.
Young, A., *Six months tour through the north of England* (London, 1770).

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