European Review of Economic History, **00**, 1–27

doi:10.1093/erehj/heac014

Sticky wages and the Great Depression: evidence from the United Kingdom

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How sticky were wages during the Great Depression? Although classic accounts emphasise the importance of nominal rigidity in amplifying deflationary shocks, the evidence is limited. In this paper, I calculate the degree of nominal wage rigidity in the United Kingdom between the wars using new granular data covering millions of wages. I find that nominal wages changed infrequently but that wage cuts were more common than wage rises on average. Nominal wage adjustment fluctuated over time and by state, so that in 1931 amid falling output and prices more than one-third of workers received wage cuts.

1. Introduction

The standard explanation for the Great Depression is that deflationary impulses were propagated by nominal rigidities (Bernanke 1995; Bernanke & Carey 1996; Eichengreen 1992; Eichengreen & Sachs 1985; Madsen 2004). In the "deflationary vortex" of the 1930s (Bernanke & Carey 1996), sticky nominal wages translated to rising real wages, which resulted in mass unemployment (Bernanke 1995). According to Keynes (1936, p. 9), who formulated the *General Theory* in the aftermath of the Depression, the nominal rigidity of wages—especially downward—was "the normal case."[1]

The United Kingdom is at the centre of this research (Beenstock & Warburton 1986; Broadberry 1986a, b; Crafts & Fearon 2013; Dimsdale 1981). Based on average wages, economic historians suggest that nominal wages were sticky in interwar Britain. As figure 1 shows, between 1929 and 1932, nominal wages declined by 5.1% (Feinstein 1972) but real consumption and product wages increased by up to 11.3% as retail prices and the GDP deflator fell by 14.7% and 6.4%, respectively (Capie & Collins 1983; Sefton & Weale 1995).[2] At the same time, unemployment spiked from 8% to 17% (Boyer & Hatton 2002). These patterns were not specific to the United Kingdom but were the statistical signature of the Great Depression.

Analyses of modern economies use micro data on nominal wages to estimate the frequency of wage changes. As micro data is rare in historical contexts, economic historians of the United Kingdom (Beenstock & Warburton 1986; Broadberry 1986a, b; Dimsdale 1981) and beyond

[1] Although Keynes (1936, p. 267) thought that wages were rigid, he rejected that perfectly flexible wages would maintain full employment: "The economic system cannot be made self-adjusting along these lines."

[2] The series for nominal wages covers the main industries and services and reflects changes in weekly wage rates, actual hours worked, and the composition of the labour force (Feinstein 1972, T. 141).

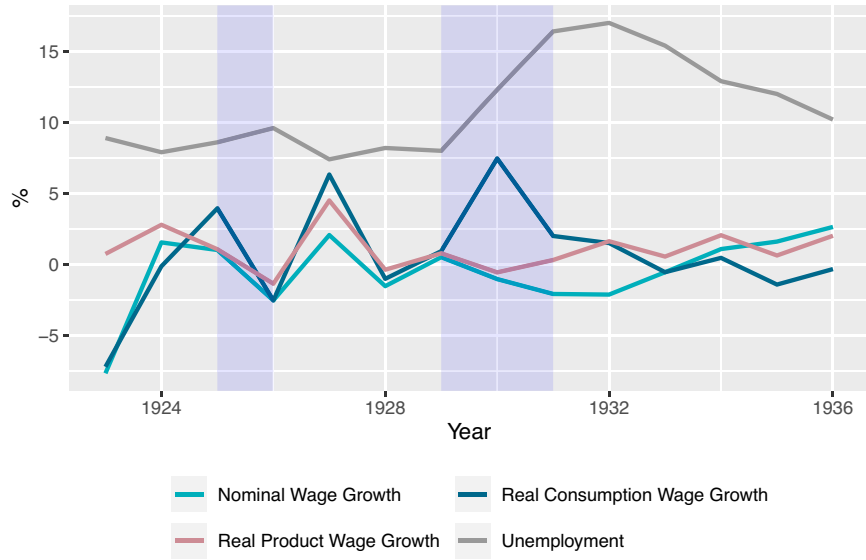

Figure 1. *The British labour market, 1923–1936. Notes and sources: This figure shows nominal wage growth, real consumption wage growth, real product wage growth, and the unemployment rate in the United Kingdom between 1923 and 1936. Real consumption wages are nominal wages divided by the retail price index. Real product wages are nominal wages divided by the GDP deflator. Nominal wages are from Feinstein (1972, T. 140). The retail price index is from Capie & Collins (1983, p. 38). The GDP deflator is from Sefton & Weale (1995, pp. 181-8). The unemployment rate is from Boyer & Hatton (2002). The shaded areas represent recessions from Broadberry et al. (2022).*

(Bernanke 1995; Bernanke & Carey 1996; Bordo *et al.* 2000; Madsen 2004) have been forced to use macro data on average wages.[3]

However, just as aggregate price indices are inadequate for the analysis of sticky prices, average wages are poor measures of sticky wages (Hazell & Taska 2021; McLaughlin 1994), as multiple sources of variation are tangled into a single statistic, such as the frequency of wage rises and cuts, the magnitude of rises and cuts, and the composition of jobs. A shift from high- to low-wage jobs, for example, will reduce average wages but is unrelated to nominal rigidity (Hazell & Taska 2021).

In this paper, I study nominal wage rigidity in interwar Britain using new quasi-micro data from the Ministry of Labour, which collected information on millions of wages each year. However, while the individual returns have seemingly been lost, the key moments that underpin modern analyses of sticky wages can be calculated from the information that survives. Despite the promise of this data, economic historians have not exploited it before.[4]

[3] Important exceptions are Hanes (2000) and Rose (2010) for the United States.

[4] To my knowledge, the only other user of this data is Routh (1980, p. 142), who reported the number of workpeople affected by changes in wage rates between 1920 and 1924. With a focus on 1923–1936, my contribution is to utilise the more granular structure of the data, express it in units comparable to modern studies on sticky wages, and to run a rich set of analyses.

I find that wages were sticky in interwar Britain compared to estimates for modern economies. On average, wages adjusted every 3.6 years. However, there was substantial heterogeneity on several levels.

First, pay cuts were more common than rises, occurring on average every 7.2 years and 8.5 years, respectively. Second, downward and upward rigidity was not constant but fluctuated over time. In the depths of the Depression, wages were less downwardly rigid. In 1931, for example, 36.3% or more than 3 million workers received wage cuts, which is greater than the United States during the Great Recession—a model of labour market flexibility—although comparisons are not straightforward (Grigsby *et al.* 2021). Third, the oscillations in stickiness over time coincided with phases of inflation and deflation, which suggests that nominal rigidity was state dependent. Fourth, stickiness varied across industries. The industry at the top of the table (transport) was ten times more flexible than the industry at the bottom (other industries).

A counterfactual simulation shows that to the extent that nominal wages fell during the Great Depression was due to an increase in the frequency of wage cuts, as opposed to an increase in the magnitude of cuts or a decline in the frequency or magnitude of rises.

What hindered the adjustment of nominal wages? An analysis of all minimum wages shows that these lower bounds were rarely changed. Therefore, if actual wages were close to the minimum, then minimum wage legislation may have contributed to stickiness by preventing nominal wages from falling. I also present evidence that directly links wage cuts to increases in strikes from 1929. As a result, the threat of strikes may have added to stickiness as firms were reluctant to cut wages.

When wages did change, the most common cause was sliding scales, which mechanically linked nominal wages to a benchmark, such as the cost of living or the firm's prices. Although this institutional quirk was not widespread, it baked in some nominal flexibility to the interwar labour market.

This paper relates to several strands of existing research. First, it develops the standard account of the Great Depression (Bernanke 1995; Bernanke & Carey 1996; Eichengreen 1992, Eichengreen & Sachs 1985; Madsen 2004) by showing that the interwar period was not a unique ice age of frozen wages. Second, it builds on recent research studying the amplification (Chadha *et al.* 2022) of shocks (Cloyne *et al.* 2018; Crafts & Mills 2013, 2015; Lennard 2020; Lennard *et al.* 2021) in interwar Britain. Third, it contributes to the literature measuring wage stickiness (Barattieri *et al.* 2014; Grigsby *et al.* 2021; Hazell & Taska 2021). As episodes of deflation and depression are rare, the 1930s is a valuable setting for investigating downward nominal wage rigidity.

The paper is organised as follows. Section 2 outlines the related literature. Section 3 introduces the key labour market institutions. Section 4 describes the data. Section 5 calculates the frequency and magnitude of nominal wage adjustment. Section 6 develops a decomposition of nominal wages. Section 7 accounts for why some wages were sticky. Section 8 explains how other wages changed. Section 9 concludes.

2. Related Literature

2.1 Contemporary

A growing body of empirical research studies wage rigidity in modern economies. In order to do so, this literature uses micro data and simple calculations that count the number of wage

TABLE 1. *Existing estimates of the share of employees receiving nominal wage changes*

Source	Sample	Data	Freezes (%)	Cuts (%)
McLaughlin (1994)	United States, 1976–1986	Panel Study of Income Dynamics	7.2	17.3
Kahn (1997)	United States, 1976–1988	Panel Study of Income Dynamics	7.5	17.8
Nickell & Quintini (2003)	United Kingdom, 1975–1999	New Earnings Survey	2.6	12.8
Gottschalk (2005)	United States, 1986–1993	Survey of Income and Program Participation	49.2–53.7	4.3–5.1
Elsby *et al.* (2016)	United States, 1980–2012	Current Population Survey	11.6–15.5	18.1–28.6
Elsby *et al.* (2016)	United Kingdom, 1975–2012	New Earnings Survey	2.9	15.6
Fallick *et al.* (2020)	United States, 1983–2019	BLS National Compensation Survey	15	16
Grigsby *et al.* (2021)	United States, 2008–2016	ADP Administrative Payroll Data	33.2	2.5
Hazell & Taska (2021)	United States, 2010–2016	BGT Online Vacancies	58.2–59.8	8.7–9.5

Notes and sources: This table summarises a selection of existing studies reporting the share of employees receiving freezes and cuts in nominal wages.

changes as a fraction of employees in the sample. The micro data is usually based on surveys (Barattieri *et al.* 2014; Elsby *et al.* 2016; Fallick *et al.* 2020; Gottschalk 2005; Kahn 1997; McLaughlin 1994; Nickell & Quintini 2003), as well as novel sources such as administrative payroll data (Grigsby *et al.* 2021) and online job postings (Hazell & Taska 2021).

Table 1 reports a selection of existing studies reporting the share of employees receiving freezes and cuts in nominal wages, which are important parameters in some theoretical models, for the United Kingdom and the United States since the 1970s.[5] The summary suggests that (1) wage freezes are relatively rare, implying that wages are quite flexible. The minimum fraction of workers experiencing a pay freeze is 2.6%, and the maximum is 59.8%. (2) Wage cuts are also quite scarce. The minimum proportion receiving pay cuts is 2.5%, and the maximum is 28.6%. (3) There is substantial heterogeneity across studies, which is clear from the large gaps between the minimums and maximums receiving wage freezes and cuts.

There are several factors, however, that distort clear comparisons between studies. The first is the macroeconomic environment. If wage changes are state dependent, contingent on the state of the economy, such as expansion versus contraction or inflation versus deflation, then the estimated rigidity will depend on the economic context. Kahn (1997), for example, who found relatively few wage freezes, studied the Great Inflation in the United States, when prices increased by up to 12% a year (Nakamura *et al.* 2018). The second is the type of compensation. Base earnings—the per-period contracted compensation—are procyclical, whereas other types of compensation, such as bonuses and overtime, are acyclical (Grigsby

[5] A freeze is a wage change of zero. A cut is a wage change of less than zero. See Dickens *et al.* (2007), Elsby & Solon (2019), and Grigsby *et al.* (2021) for a summary of estimates of wage freezes and cuts beyond the United Kingdom and United States.

et al. 2021). Grigsby *et al.* (2021) show that 3.9% of workers receive a year-on-year reduction in base earnings per hour, whereas 17.2% receive cuts in total earnings per hour. Therefore, studying base earnings, like Grigsby *et al.* (2021), or total earnings, like Elsby *et al.* (2016), will affect estimates of rigidity. The third is the type of employee. Job-stayers—workers who are continuously employed by the same firm—and new hires are about as likely to receive changes in base earnings, whereas job-changers are much more likely due to selection (Grigsby *et al.* 2021).

An important empirical challenge in this literature is measurement error. Studies based on household surveys, such as the Panel Study of Income Dynamics, use self-reported wages to determine if there has been a wage change (Barattieri *et al.* 2014, Gottschalk 2005). If, however, the reported wage is rounded or approximate (Kahn 1997), then there is a risk of both false positives and false negatives in the identification of wage changes (Elsby *et al.* 2016). Thus, estimates of wage rigidity based on self-reported surveys are likely to be biased (Elsby & Solon 2019). To deal with this issue, new methods (Barattieri *et al.* 2014, Gottschalk 2005) and data sources (Grigsby *et al.* 2021, Hazell & Taska 2021) have been used.

2.2 Historical

Empirical work on the Great Depression has used macro data to investigate nominal wage rigidity. An important starting point is Eichengreen & Sachs (1985), who found a positive association between exchange rate depreciation and industrial production growth in a sample of 10 economies between 1929 and 1935. They suggest that one mechanism through which the exchange rate affected output was through real wages, assuming the slow adjustment of nominal wages.

Bernanke (1995) and Bernanke & Carey (1996) built on Eichengreen & Sachs (1985) by focusing on the role of nominal wage rigidity as a propagation mechanism during the Depression. Based on a sample of 22 economies between 1931 and 1936, Bernanke & Carey (1996) estimated by non-linear instrumental variables that there was incomplete adjustment of average nominal wages to changes in prices, concluding that there was a "substantial degree of stickiness" in wages and that it was the stickiness of wages, as opposed to prices, that was "the dominant source of non-neutrality."

Madsen (2004), who studied a panel of up to 12 economies between 1927 and 1938, estimated using several econometric methods that price stickiness was more important than wage stickiness in the 1930s.

For the United Kingdom, a key reference is Dimsdale *et al.* (1989). Using a macroeconometric model for the interwar economy, they estimated that demand shocks raised unemployment because wages and prices were sticky. In addition, there have been some important passing references to sticky wages in interwar Britain. Beenstock & Warburton (1986) calculated by ordinary least squares that the own-product real wage was negatively associated with employment between 1923 and 1938, which they conjectured may have been due to sticky wages. Based on the behaviour of average nominal wages and the retail price index, Dimsdale (1981) and Broadberry (1986a, b) noted that there was unprecedented downward flexibility during the Great Slump of 1919–1921, but that nominal wages were stickier thereafter. In a survey, Crafts & Fearon (2013, p. 49) wrote that "the deflationary shock interacted with the inflexibility of wage and price-setting behaviour to create a difficult adjustment problem during which unemployment rose considerably as real-product wages increased markedly."

For the United States, there is a larger literature on nominal wage rigidity during the Great Depression using macro data and theoretical or econometric models (Amaral & MacGee 2017; Bernanke 1986; Bordo *et al.* 2000; Christiano *et al.* 2003; Cole & Ohanian 2001; Ohanian 2009) and micro data based on surveys of manufacturing firms from the Bureau of Labor Statistics (Creamer & Bernstein 1950; Dunlop 1944; Hanes 2000; Rose 2010; Shister 1944).[6] This research has found mixed results on the incidence and consequences of sticky wages.[7]

In summary, the stickiness of wages during the Great Depression, in the United Kingdom and in other economies, remains an open question.

3. Institutions

Wages in interwar Britain were shaped by several institutions.[8] First, some wages had a floor set by Trade Boards that were specific to job, gender, and region and varied over time. For example, the minimum wage for a bespoke tailor was 8 pence for females and 12 pence for males in Yorkshire in 1931, but 9.5 pence for females and 14.5 pence for males in East Lancashire (Ministry of Labour 1933). These rates were unchanged in Yorkshire in 1932, but lowered in East Lancashire.

Second, there was the outside option provided by unemployment insurance, which was significantly expanded in 1920 to cover "all manual and non-manual workers earning less than £250 p.a., with the exception of workers in agriculture, domestic services, and certain groups of permanent employees" (Deacon 1976, p. 14). The generosity of the scheme has been debated by economic historians (Benjamin & Kochin 1979, Metcalf *et al.* 1982).

Third, sliding scales linked nominal wages to either the firm's product prices, the firm's profits, or to a cost of living index. Wages were then adjusted periodically in response to fluctuations in these indicators. Indexing wages to output prices was common in the iron and steel industry, while linking wages to profits occurred in the coal industry (Trade Union Congress Archives 1930-1933). These sliding scales governed the wages of 220,000 employees in 1925 (Ministry of Labour 1925, p. 269). Tying wages to the cost of living was routine in a number of industries, from food and drink to textiles, affecting the wages of "rather more than 2.5 million" employees in 1925 (Ministry of Labour 1925, p. 228) and between 0.75 to 1.25 million in 1933 (Pool 1938, p. 257).

Fourth, wages also changed through collective bargaining, between employees and trade unions on one side and firms and employers' associations on the other, which had developed by the end of the First World War to negotiate wages, hours, and other terms of employment, and to resolve disputes by arbitration and conciliation (Ince 1951). Union membership increased throughout the Great War to 41.1% in 1920, but fell to less than 23% by 1933 (Feinstein 1972, Ministry of Labour 1937).

Fifth, when disputes could not be resolved through collective bargaining, there was the option of government assistance through a permanent court of arbitration created by the Industrial Courts Act of 1919 (Ince 1951), which was an "independent tribunal in no way subject to Government or Departmental control or influence" (*British Medical Journal*, 27 January 1945, p. 11).

[6] The data compiled by the Bureau of Labor Statistics and the Ministry of Labour for the interwar American and British economies is quite similar with comparable information on the sign and size of wage changes by industry.

[7] For studies on nominal wage rigidity in other periods of American history, see Hanes (1993) and Hanes & James (2003).

[8] See Hatton (1988a) for a more detailed account of the development of British labour market institutions.

4. Data

Modern analyses of nominal wage adjustment use micro data such as surveys (Barattieri *et al.* 2014, Elsby *et al.* 2016, Fallick *et al.* 2020, Gottschalk 2005, Kahn 1997, McLaughlin 1994, Nickell & Quintini 2003), administrative payroll data (Grigsby *et al.* 2021), and online job postings (Hazell & Taska 2021). The richness of this data, often consisting of millions of observations, is summarised into a few key parameters, such as the frequency of adjustment, the sign and size of adjustment, and so on.

Historically, micro data on wages in the United Kingdom would have been collected but the underlying data is seemingly missing. However, while the micro data is not available, the key quantities of modern analyses of sticky wages have survived. These statistics—the very objects we would calculate today—were calculated at the time using the lost micro data.

The source is *The Ministry of Labour Gazette*, which "compiled returns collected by the Ministry of Labour from employers and their associations, trade unions, and other sources" (Ministry of Labour 1937, pp. 88-9). The *Gazette* reported the following statistics for the United Kingdom: (1) the number of employees receiving wage rises and wage cuts, (2) the change in the weekly wage bill due to wage rises and wage cuts, and (3) the methods by which wage changes were arranged. This data was reproduced in the *Twenty-Second Abstract of Labour Statistics of the United Kingdom* (Ministry of Labour 1937), which, unless otherwise stated, is the source I use as it includes revisions.

The statistics are reported as aggregates and by industry group. The groups are as follows: (1) mining and quarrying; (2) brick, pottery, glass, chemical, etc.; (3) metal, engineering, and shipbuilding; (4) textile; (5) clothing; (6) paper, printing, etc; (7) building, public works contracting, etc; (8) transport; (9) gas, water, electricity, and public administration services; and (10) other industries. However, the returns do not cover all industries, excluding "agricultural labourers, Government employees, domestic servants, shop assistants and clerks" (Ministry of Labour 1937, p. 88).[9]

In order to calculate the frequency of adjustment, the relative size of the sample, and so on, an important variable is the number of employees in the included industries. The most useful source is the Department of Employment and Productivity's *British Labour Statistics* (1971, pp. 216-7), which reports the number of (female and male) insured employees aged 16 years and older (1923–197) and aged 16–64 years (1927–1936) at each mid-year in the United Kingdom by industry. Using the information above on the industries that are included and excluded in the *Gazette* returns, I match industries to calculate the number of employees in the sample industries. On this basis, I include all employees reported in *British Labour Statistics* (1971, pp. 216-7) other than those working in agriculture, the distributive trades, and national government service.

Annual data is available for most variables between 1923 and 1936, although many extend back to the late nineteenth century (Board of Trade 1915, p. 72). As a result, I focus on the period 1923–1936, unless otherwise stated. This yields a sample of up to 9.7 million employees, which represents 49.2% of civil employment and 48.3% of total employment. Table 2 reports the minimum, maximum, and mean sample sizes. Even by the standards of modern studies, the sample is extraordinarily large. Cutting edge research in macroeconomics does not have access to the population but uses samples (Grigsby *et al.* 2021; Hazell & Taska 2021; Kahn 1997).

[9] The excluded industries made up approximately 22% of total employment (Feinstein 1972, Tt. 126-7, 129).

TABLE 2. *Sample size*

	Employees in sample (Million)	Share of civil employment (%)	Share of total employment (%)
Minimum	8.1	44.1	43.4
Maximum	9.7	49.2	48.3
Mean	8.8	47.0	46.1

Notes and sources: This table reports summary statistics for the sample used in the analysis. Employees in the sample is from Department of Employment and Productivity (1971). Civil employment and total employment is from Feinstein (1972, Tt. 126-7).

Before moving on to the analysis, there are some elements of the data to discuss further. First, as with much of the micro data used in modern analyses (Barattieri *et al.* 2014; Gottschalk 2005; Grigsby *et al.* 2021; McLaughlin 1994), there is the possible issue of measurement error. As the Ministry of Labour relied on returns, it is possible that there was some under-reporting of wage changes. The Ministry of Labour suggested that the wage changes of "unorganised workers" of "individual employers" may not be reported (Ministry of Labour 1937, p. 88). Therefore, firms that were large or unionised were more likely to report than those that were not. It could also be that wage cuts were more likely than rises to reach the Ministry, as cuts had a greater propensity to cause industrial action. Under-reporting will bias measured nominal rigidity *up*, so that the true degree of rigidity will be lower than estimated. The extent of under-reporting is explored in Section 5.

Second, the authorities counted a wage change if the wage at the end of the year was different to the wage at the start (Ministry of Labour 1937, p. 88). Therefore, if a wage was changed by $£x$ and changed again by $-£x$ within the year, so that the wage was the same at the end of the year as it was at the start, a wage change would be missed and the degree of stickiness would be overestimated. The "restoration of wage cuts", for example, was not uncommon (Trade Union Congress Archives 1934-1945). However, while the Ministry of Labour did not report these individuals under wage rises or wage cuts, they are included in the total affected by wage changes. Therefore, they can be calculated as the difference between total wage changes and the sum of wage rises and wage cuts.

Third, the *Gazette* (1932, p. 4) captures changes in wages arising from changes in wage rates, as opposed to hours or employment. In other words, it measures the base earnings of job-stayers and/or new hires.

5. Results

5.1 The frequency of nominal wage adjustment

Using the data from the Ministry of Labour, it is possible to calculate the first estimates of wage stickiness for interwar Britain. To do so, I divide the number of employees receiving wage changes by the number of employees in the sample industries for each year. As shown in figure 2, the unconditional probability of a wage change was 27.7% a year. Put differently, 72.3% of workers had their wages frozen on average each year. This implies that nominal wages remained fixed for 3.6 years on average.

Yet the average suppresses significant temporal heterogeneity. In 1923 and 1924, there was considerably more flexibility, when 54.6% and 43.6% of employees received pay changes

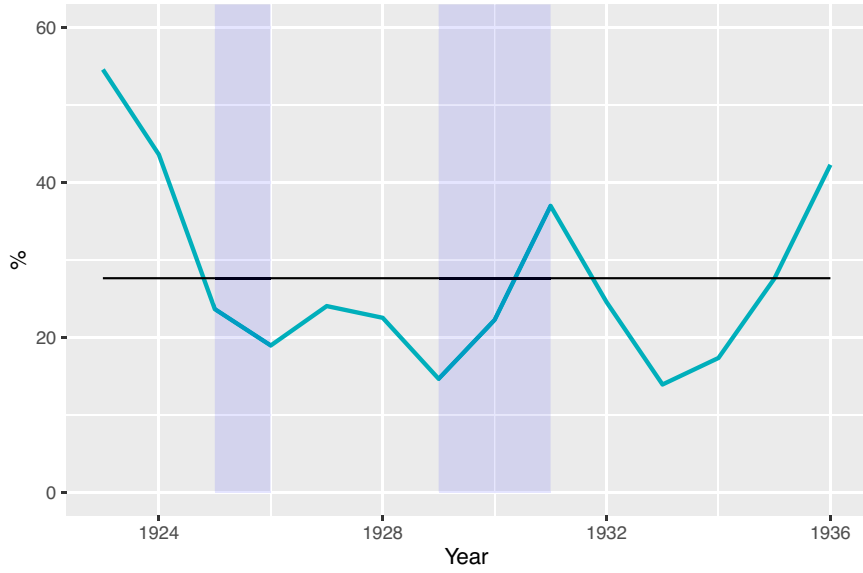

Figure 2. *The share of employees receiving nominal wage changes, 1923–1936. Notes and sources: This figure shows the frequency of nominal wage adjustment in the United Kingdom between 1923 and 1936. The series has been calculated using information from the Ministry of Labour (1937, p. 88) and Department of Employment and Productivity (1971, pp. 216-7). The black line is the sample mean. The shaded areas represent recessions from Broadberry et al. (2022).*

respectively. Following the return to the gold standard in 1925, wage changes were more scarce, when less than a quarter received changes. Having fallen to just 14.7% in 1929, the frequency of adjustment increased during the Great Depression. It rose to 22.3% in 1930, 37% in 1931 and 24.6% in 1932. 1933 was the most rigid year in the sample, when just 13.9% of wages changed. From 1934, wages became increasingly flexible. In 1936, 42.3% of employees received changes in pay.

A clean comparison with other estimates is complicated by differences in the macroeconomic context and data. Putting these issues to one side, it is interesting that wage freezes were more common than in any other context covered by the studies reported in Table 1. Taking these issues into account, the nearest neighbour is the paper by Grigsby *et al.* (2021), who study the base earnings of job-stayers in the United States between 2008 and 2016, when there was a spell of falling output and prices. On this basis, wage freezes were more than twice as likely in Britain between the wars than in the United States in the aftermath of the Great Recession. However, even this comparison is imperfect as deflation was more severe in interwar Britain.

5.2 Downward and upward rigidity

The critical issue—in macroeconomic models (Dupraz *et al.* 2021) and in the historiography—is not the overall level of nominal wage rigidity but the level of downward rigidity. As a result, I plot the fraction of wage cuts and rises in figure 3. On average, the frequency of pay

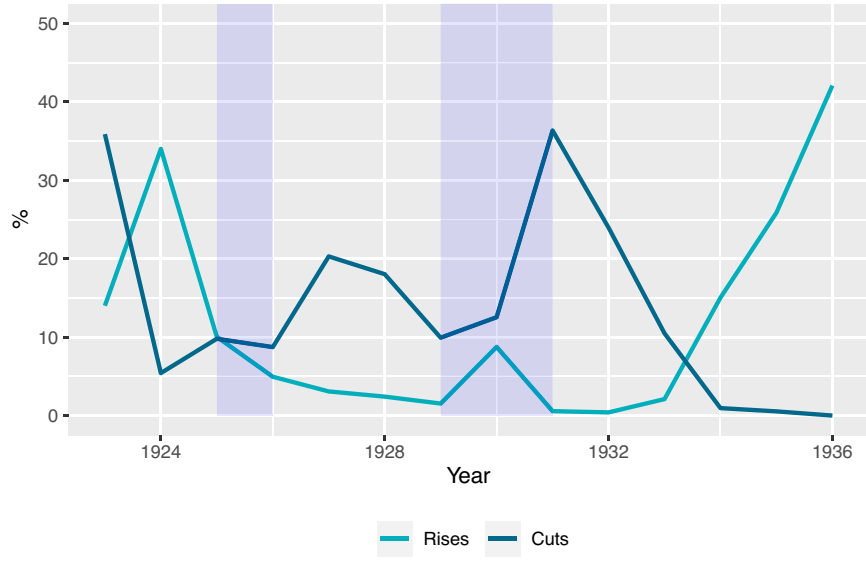

Figure 3. *The share of employees receiving rises and cuts in nominal wages, 1923–1936. Notes and sources: This figure shows the frequency of rises and cuts in nominal wages in the United Kingdom between 1923 and 1936. The series have been calculated using information from the Ministry of Labour (1937, p. 88) and Department of Employment and Productivity (1971, pp. 216-7). The shaded areas represent recessions from Broadberry et al. (2022).*

rises was 11.8% a year; the frequency of pay cuts was 13.8% a year. Therefore, in contrast to modern economies, downward rigidity was no greater than upward rigidity in interwar Britain.

During the key period of the Great Depression, there were masses of wage cuts. Between 1930 and 1932, the average frequency of cuts was 24.3%, of which 12.5% of employees received reduced pay in 1930, 36.3% in 1931, and 24% in 1932. To put these numbers into context, the wage cuts in 1931 alone affected more than 3 million workers.

The waning rigidity in the slump observed in the data is confirmed in qualitative evidence. In May 1931, the *Economist* (30 May 1931, p. 1143) noted that "wage negotiations are pending in a number of important British industries, among them engineering, shipbuilding and docks, and it is clear that this summer will bring to the forefront the main question, which a long-continued depression in trade was bound to raise, whether a widespread reduction in wage-levels has or has not become essential." According to the Trade Union Congress, there was a subsequent "Attack on Wages": a coordinated attempt "to bring down wages all round [. . .] by the large organisations of employers" (Trade Union Congress Archives 1931). Therefore, during the Depression itself, when deflation and slump were sharpest, nominal rigidities were lessened, possibly because menu costs were minor frictions in the context of the macroeconomic volatility.

Added to this misery was the disappearance of pay rises. In 1930, just 0.6% of employees had the good fortune of a raise, falling to 0.4% in 1931. During the economic recovery, wage rises reversed cuts, such as at the Decca Record Company, Imperial Chemical Industries, and many local councils (Trade Union Congress Archives 1930-1933). From 1934, pay rises vastly outnumbered cuts. At the close of 1935, the *Financial Times* (9 November 1935, p. 4)

wrote that "there is little doubt [. . .] that the position of the worker in this country has been improved relatively to his 1929 standard."

While wages seem sticky based on the frequency of wage changes, the conclusion is different when focusing on wage cuts in the final column of Table 1. On this basis, interwar Britain had quite low downward nominal wage rigidity. A better, albeit imperfect, comparison is with Grigsby *et al.* (2021), who find that the propensity of a wage decrease was 2.5% in the United States between 2008 and 2016, rising just above 6% between the end of 2009 and the beginning of 2010. In the United Kingdom between 1923 and 1936, the average frequency of wage cuts was 13.8%, peaking at 36.3% in 1931. Therefore, in terms of downward nominal wage rigidity, the United Kingdom during the Great Depression was more flexible than the United States during the Great Recession.

How can we reconcile the twin facts of few wage changes and many wage cuts? The answer lies in the scarcity of wage rises. In modern economies, an annual raise is the norm, but in interwar Britain the likelihood was just 11.8% or a raise every 8.5 years on average. Thus, if one studies wage *changes*, the British economy between the wars appears sticky. However, in the context of the deflation and depression of the 1930s, in which the important metric is wage *cuts*, interwar Britain was rather flexible.

The average frequency of rises (11.8%) and cuts (13.8%) does not sum to the average frequency of changes (27.7%). This is because changes also include reversals, which were offsetting within-year fluctuations. For example, a cut of £x, later restored with a raise of £x. These zero sum wage changes were relatively infrequent, accounting for the remaining 2.1%. Reversals were slightly more common before the Depression, averaging 3.4% between 1923 and 1929, than after, when the average was less than 1%.

5.3 State dependence

We have discovered that wages were fixed for a duration that was not constant over time. As figure 2 shows, while the average probability of a wage change was 27.7% between 1923 and 1936, the lowest was 13.9% in 1933 and the highest was 54.6% in 1923. Could this time heterogeneity be associated with the state of the economy so that nominal rigidity was state dependent? For example, nominal rigidity could be different during expansions and contractions or inflations and deflations.

Table 3 reports the results of a simple exercise in which the average frequency of wage changes is calculated according to the state of the economy. The chronology of the business cycle is from Broadberry *et al.* (2022) and of prices from Capie & Collins (1983, p. 38).[10] There are differences between expansions and contractions with the boom associated with slightly more rises than cuts and the bust with rather more cuts than rises. The overall probability of a wage change is marginally higher in expansions than contractions. However, the differences are not statistically significant, possibly due to the short sample.

There is a large, statistically significant difference between inflations and deflations, with pay cuts far more likely when prices are decreasing and rises more frequent when prices

[10] Broadberry *et al.* (2022) define an expansion as "a significant increase in economic activity ranging from the period following the trough to the peak" and a contraction as "a significant decrease in economic activity ranging from the period following the peak to the trough." I define an inflationary state as a period of increasing prices, measured by the Retail Price Index at the end of each year.

TABLE 3. *The share of employees receiving nominal wage changes by state (%)*

State	Sample	Cuts	Rises	Changes
		Business cycle		
Expansion	1923–1925, 1927–1929, 1932–1936	12.3	13.7	28.1
Contraction	1926, 1930–1931	19.2	4.8	26.1
Difference		-6.9	8.9	2.0
		Prices		
Inflation	1924, 1934–1936	1.7	29.2	32.7
Deflation	1923, 1925–1933	18.6	4.8	25.6
Difference		-16.9***	24.5***	7.1
All states	1923–1936	13.8	11.8	27.7

Notes and sources: This table reports the mean frequency of nominal wage changes conditional on the state of the business cycle and the course of prices. The chronology of the business cycle is from Broadberry *et al.* (2022) and of prices from Capie & Collins (1983, p. 38). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

are increasing.[11] Therefore, this exercise suggests that nominal rigidity is state dependent, with stronger evidence for the relevant state being inflation or deflation than expansion or contraction.

5.4 *Sectoral heterogeneity*

The granularity of the information collected by the Ministry of Labour has allowed me to explore heterogeneity over time, up and down, and by the state of the economy, but what about by industry? This will shed light on whether sticky wages were an aggregate or sectoral characteristic. As Table 4 shows, there was a good deal of variation in nominal wage rigidity across industries. The most flexible were as follows: transport; mining and quarrying; and building, public works contracting, etc. In these industries, wages changed with a probability of between 40.6% and 63.4%, which suggests an average duration of wages of 1.6–2.5 years. Other industries were far stickier. The least flexible were the following: brick, pottery, glass, chemical, etc.; paper, printing, etc.; and other industries. The probability of a wage change in these industries was between 6.1% and 18.8%, which implies that wages were changed once every 5.3–16.4 years.

Focusing on wage cuts, there is a similar ranking of industries. The most flexible were as follows: transport; building, public works contracting, etc.; and textile, in which the average frequency of wage cuts was 20.3% to 31.4%. The least flexible were the following: brick, pottery, glass, chemical, etc.; paper, printing, etc.; and other industries, in which the average frequency of wage cuts was 3.1%–6.6%.

However, this disaggregation is only approximate. Matching the industries reported in the Ministry of Labour's *Gazette* (1937) with those in the Department of Employment and Productivity's *British Labour Statistics* (1971) resulted in a few industry-year observations of

[11] The results are similar for retail prices (Capie & Collins 1983, p. 38) and the GDP deflator (Sefton & Weale 1995, pp. 181-8).

TABLE 4. *The share of employees receiving nominal wage changes by industry (%), 1923–1936*

Industry	Cuts	Rises	Changes
Transport	31.4	29.1	63.4
Mining and quarrying	20.0	23.3	44.3
Building, public works contracting, etc.	25.1	13.7	40.6
Gas, water, electricity, and public administration services	14.0	16.4	34.3
Textile	20.3	8.4	32.0
Metal, engineering, and shipbuilding	11.1	15.1	27.6
Clothing	11.2	4.7	22.9
Brick, pottery, glass, chemical, etc.	6.6	12.0	18.8
Paper, printing, etc.	4.0	1.0	9.0
Other industries	3.1	2.0	6.1

Notes and sources: This table reports the mean frequency of nominal wage adjustment by industry in the United Kingdom between 1923 and 1936. The series have been calculated using information from the Ministry of Labour (1937, pp. 88-91) and Department of Employment and Productivity (1971, pp. 216-7).

wage changes exceeding 100%. This suggests that although the industries reported in the two publications are close in name, there are some differences in the allocation of employees across industries. This is mainly an issue of the industry-level, as opposed to the aggregate, analysis.

5.5 The magnitude of nominal wage adjustment

We have explored the sign of wage changes but what about the size? This can be calculated by dividing the change in the weekly wage bill due to wage rises or cuts by the number of employees receiving wage rises or cuts, which were reported by the Ministry of Labour (1937, p. 88).[12] As figure 4 shows, when contracts were altered, the changes in pay were non-trivial. The average wage rise was 6.2%, the average cut was 6.8%, which is further evidence that wages were no more sticky down than up. During the Great Depression, rises shrank in size, while cuts grew. In 1931, for example, the average rise was 5.6%, the average cut was 6.9%. However, the early 1930s were not the years with the biggest pay cuts. The average cut was 10.8% in 1927 and 11.5% in 1936.

5.6 Under-reporting of wage changes

A general challenge in the sticky wage literature is imperfect data.[13] With the data from the Ministry of Labour, the main limitation is the potential under-reporting of wage changes, with "unorganised workers" of "individual employers" most susceptible (Ministry of Labour 1937, p. 88). If this were the case, it would bias down the frequency of adjustment. A useful cross-check is to construct an average wage index using the information on the frequency and magnitude of wage rises and cuts from the Ministry of Labour and compare it to established average wage indices from the Department of Employment and Productivity (1971, p. 53),

[12] To convert the average pay changes from £ to %, I divide by lagged average weekly earnings from Feinstein (1972, T. 140) and Chadha *et al.* (2018).

[13] Dickens *et al.* (2007), for example, find that these data set "characteristics" are a significant source of estimated nominal wage rigidity across countries and time.

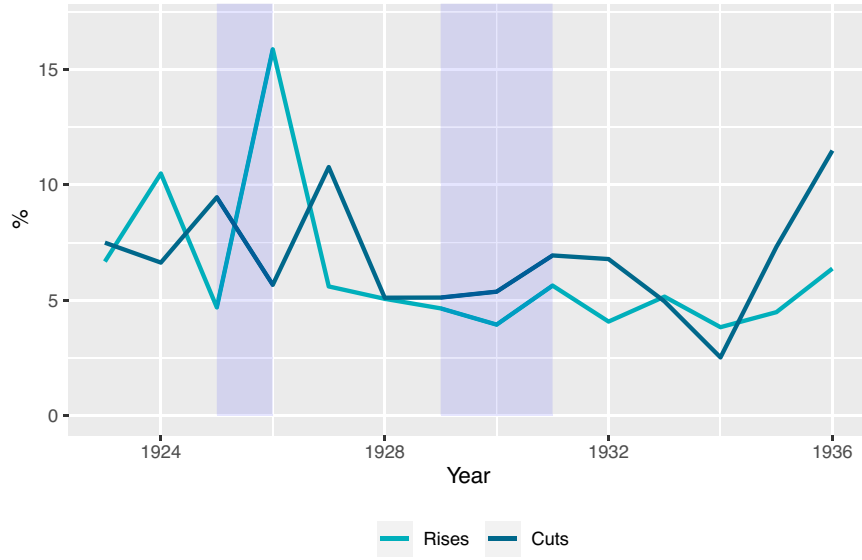

Figure 4. *The magnitude of rises and cuts in nominal wages, 1923–1936. Notes and sources: This figure shows the mean rise and cut in nominal wages in the United Kingdom between 1923 and 1936. The series have been calculated using information from the Ministry of Labour (1937, p. 88), Feinstein (1972, T. 140), and Chadha et al. (2018). The shaded areas represent recessions from Broadberry et al. (2022).*

Capie & Collins (1983, p. 62)—which was calculated by Arthur Bowley for the London and Cambridge Economic Service—and Feinstein (1972, T. 140).[14]

Figure 5 plots the four series of nominal wage growth.[15] The comovement is particularly strong between the simulated series and those from the Department of Employment and Productivity ($r = 0.98, p < 0.01$) and Capie and Collins ($r = 0.90, p < 0.01$). The association is positive and statistically significant but weaker between the simulated series and that from Feinstein ($r = 0.54, p < 0.05$). However, between 1929 and 1936, the main period of interest, the correlation rises to 0.95 ($p < 0.01$). That the correlations are high is reassuring. That they are not perfect is to be expected as the Ministry of Labour excluded some industries, such as agriculture and government, and average wages reflect additional factors, such as changes in hours and the composition of jobs (Feinstein 1972, T. 141). The absence of persistent undershoot or overshoot suggests that wage rises or cuts are not systematically missing.

6. Decomposing Nominal Wages

Firms can control the wage bill through multiple channels—the frequency of wage rises, the magnitude of wage rises, the frequency of wage cuts, and the magnitude of wage cuts—given

[14] To construct an index of average wages from the Ministry of Labour data, I use equation 7.
[15] The log levels of the four series are shown in Figure A1.

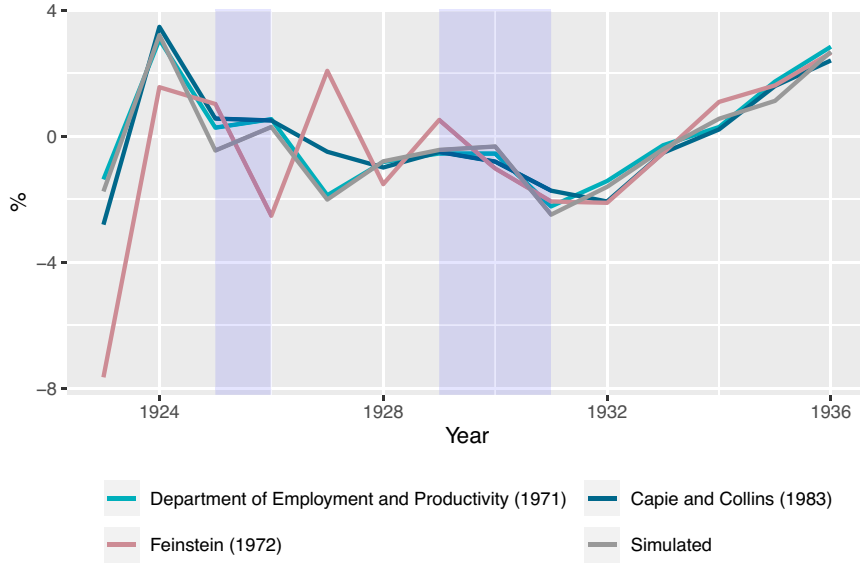

Figure 5. *A comparison of nominal wage growth, 1923–1936. Notes and sources: This figure shows nominal wage growth in the United Kingdom between 1923 and 1936 based on estimates by the Department of Employment and Productivity (1971, p. 53), Capie & Collins (1983, p. 62), Feinstein (1972, T. 140), and a simulation based on equation 7. The shaded areas represent recessions from Broadberry et al. (2022).*

the level of hours and employees. In this section, I develop a decomposition that links these four channels to average wage growth during the Great Depression.

Define the change in the total wage bill at time t as follows:

$$\Delta B_t = B_t^+ - B_t^-, \tag{1}$$

where B_t^+ is the increase in the total wage bill for employees who received wage rises and B_t^- is the decrease in the total wage bill for employees who received wage cuts.

The increase in the total wage bill due to wage rises is given by the number of employees receiving wage rises, N_t^+, multiplied by the average wage rise, ΔW_t^+, and vice versa for the decrease in the total wage bill due to wage cuts:

$$B_t^+ = N_t^+ \Delta W_t^+. \tag{2}$$

$$B_t^- = N_t^- \Delta W_t^-. \tag{3}$$

Insert equations 2 and 3 into 1:

$$\Delta B_t = N_t^+ \Delta W_t^+ - N_t^- \Delta W_t^-. \tag{4}$$

Divide by the total number of employees, N_t:

$$\frac{\Delta B_t}{N_t} = \frac{N_t^+}{N_t}\Delta W_t^+ - \frac{N_t^-}{N_t}\Delta W_t^-. \tag{5}$$

Note that $\frac{\Delta B_t}{N_t}$ is the average change in wages, which can be denoted as ΔW_t. Inserting $\Delta W_t = \frac{\Delta B_t}{N_t}$ into equation 5 yields:

$$\Delta W_t = \frac{N_t^+}{N_t}\Delta W_t^+ - \frac{N_t^-}{N_t}\Delta W_t^-. \tag{6}$$

In order to fix the decomposition in percentages, divide by lagged average wages, W_{t-1}:

$$\frac{\Delta W_t}{W_{t-1}} = \frac{N_t^+}{N_t}\frac{\Delta W_t^+}{W_{t-1}} - \frac{N_t^-}{N_t}\frac{\Delta W_t^-}{W_{t-1}}. \tag{7}$$

This decomposition suggests that the growth in average wages is equal to the following: (1) the share of employees who receive wage rises, $\frac{N_t^+}{N_t}$; (2) the average wage rise, $\frac{\Delta W_t^+}{W_{t-1}}$; (3) the share of employees who receive wage cuts, $\frac{N_t^-}{N_t}$; and (4) the average wage cut, $\frac{\Delta W_t^-}{W_{t-1}}$. Therefore, this identity shows that wage growth depends on the frequency, size, and sign of wage changes.

In order to quantify the importance of each channel, I construct four counterfactuals. In each counterfactual, I shut down one channel at a time by setting it to the sample mean. Figure 6 holds fixed the frequency of wage rises in Panel A, the magnitude of wage rises in Panel B, the frequency of wage cuts in Panel C, and the magnitude of wage cuts in Panel D. The difference between the counterfactual and actual outcomes is the contribution of each channel to average nominal wage growth.

In all cases except one, there is little difference between the counterfactual and actual outcomes during the Depression. The frequency of wage rises, the magnitude of wage rises, or the magnitude of wage cuts contributed little to nominal wage growth in the early 1930s. However, in the case of the frequency of wage cuts, there is a bigger contribution. The spike in wage cuts in the early 1930s substantially lowered nominal wage growth.

In summary, the decomposition shows that nominal wages fell during the Great Depression for one reason: the frequency of wage cuts. Therefore, to the extent that nominal wages fell was due to downward nominal wage *flexibility*.

7. Accounting for Stickiness

Why were some wages sticky? In this section, I explore five explanations: minimum wages, unionisation, strikes, unemployment benefits, and exports. A natural way forward would be to use the industry-level information in a panel regression of the frequency of wage changes on various independent variables. However, the challenge of matching industries discussed in Section 5 is deepened when trying to link the frequency of wage changes with potential explanatory variables. Minimum wages, for example, were set by job not industry

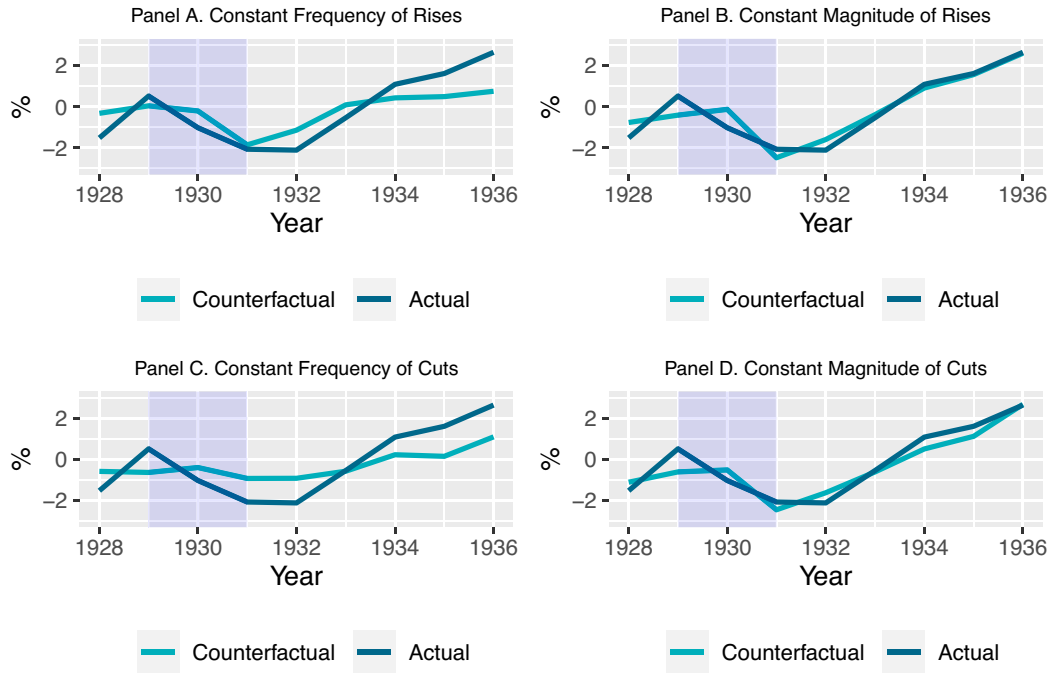

Figure 6. *A decomposition of nominal wages, 1928–1936. Notes and sources: This figure shows actual and counterfactual average nominal wage growth in the United Kingdom between 1928 and 1936. The series have been calculated using information from the Ministry of Labour (1937, p. 88), Department of Employment and Productivity (1971, pp. 216-7), Feinstein (1972, T. 140), and Chadha et al. (2018). The shaded area represents recession from Broadberry et al. (2022).*

and also varied by gender and region.[16] On top of the issue of matching, there is another of endogeneity, stemming from reverse causality (strikes, for example, may be both a cause and consequence of wage changes) and from omitted variables (wages are an equilibrium outcome between employees and firms that depend on a long list of factors). I advance by working through one potential explanation at a time, using the best available evidence in each case.

7.1 Minimum wages

Solomou (1996, p. 95) conjectures that minimum wages may have been a binding constraint on firms that would have otherwise cut wages. In order to explore this possibility, I construct a data set on the full schedule of minimum wages from primary sources (Ministry of Labour 1926-36). The complexity of the legislation results in 1,414 job-gender-region-year observations between 1926 and 1936.

[16] For instance, in the clothing industry, there were specific minimum wages for the jobs of the following: boot and shoe repairing; button manufacturing; dressmaking and women's light clothing; hat, cap and millinery; and so on (Ministry of Labour 1933, pp. 112-4).

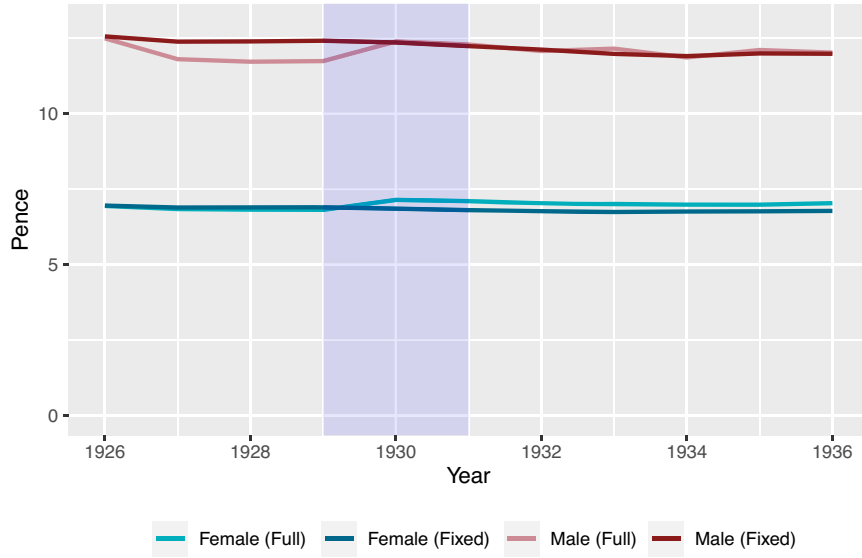

Figure 7. *Average nominal minimum wages, 1926–1936. Notes and sources: This figure shows the mean nominal minimum wage by gender in the United Kingdom between 1926 and 1936. The series have been calculated using information from the Ministry of Labour (1926-36). The shaded area represents recession from Broadberry et al. (2022).*

Figure 7 plots the average minimum wage in pence per hour for females (blue lines) and males (red lines). The darker lines are the average of a fixed sample of minimum wages that were in force during the full period. The lighter lines are the average of all minimum wages.[17] Based on the fixed sample, which controls for the changing composition of jobs covered by the legislation, minimum wages fell for females and males each year between 1930 and 1933. However, the cuts were small—lower than 1.2% each year—which was less than the rate of deflation in 1930, 1931, and 1932. As a result, real minimum wages increased.

Looking behind the averages, figure 8 shows that 26.9% of job-gender-region rates were *raised* in 1930, but only 8.5% were cut. The frequency of cuts rose to 13.8% in 1931 and 16.9% in 1932. Therefore, nominal minimum wages were more sticky than actual nominal wages during the Great Depression. This suggests that the nominal floor may have propped up wages that would otherwise have fallen.

If minimum wages were a binding constraint, we would expect that wages would be bunched around the minimum. While the full distribution of wages is not available, we can look at a related piece of evidence. Under the Trade Boards Acts, the wage records of firms were inspected. If it was found that minimum wages were not paid, firms were required to compensate employees with arrears that were due to them. Therefore, if the distribution of wages shifted towards the minimum, we would expect that more breaches would be uncovered by the inspectors. In figure 9, each stack plots the number of employees that were underpaid by the fraction of the minimum wage that was paid. The sum of the stacks is the total number of underpaid employees. The figure suggests that the incidence and severity of breaches

[17] Figure A2 shows log indices of average minimum wages for females and males.

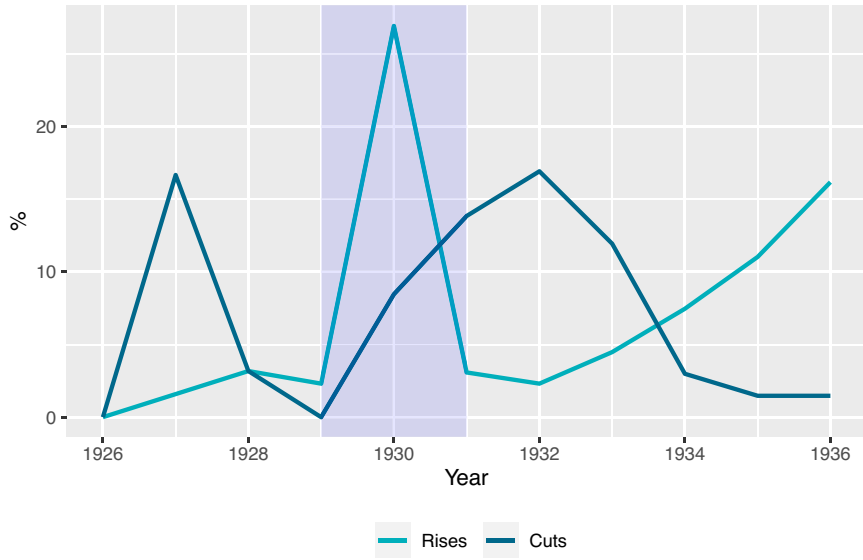

Figure 8. *The frequency of rises and cuts in nominal minimum wages, 1926–1936. Notes and sources: This figure shows the frequency of rises and cuts in nominal minimum wages in the United Kingdom between 1926 and 1936. The series have been calculated using information from the Ministry of Labour (1926-36). The shaded area represents recession from Broadberry et al. (2022).*

increased during the downturn. While breaches were uncommon in 1929, affecting 5,214 employees, there were 6,812 in 1930 and 7,011 in 1931. In addition, the breaches became more egregious. While 62.2% of underpaid workers were being paid at least 90% of the minimum wage in 1929, the proportion fell to 55.6% in 1930 and 50.9% in 1931. The implication is that there was an increase in the share being paid below 90% of the minimum wage.

Overall, this evidence is suggestive if not conclusive. On one hand, the breaches show that the minimum wage was not an important impediment, at least for the firms that were caught underpaying each year. On the other, the breaches suggest that for some jobs the shadow wage had sunk below the minimum wage, which policymakers did not fully adjust to the deflationary shock. Therefore, there may have been some institutional treacle that contributed to the stickiness of wages.

7.2 Unionisation

An interesting hypothesis is that unionisation had an impact on the rigidity of nominal wages. According to Broadberry (1986b, p. 91): "A combination of a decline in the proportion of the labour force unionised, and the playing of a cooperative game between unions, industry and government would explain the unusual degree of downward nominal wage flexibility until 1923. However, after that date, trade union density levelled out, and trade unions returned to their prewar non-cooperative perceptions on nominal wage bargaining."

One way to explore this is with industry-level data by matching data on wage changes (Ministry of Labour 1937, pp. 88-91), employment (Department of Employment and

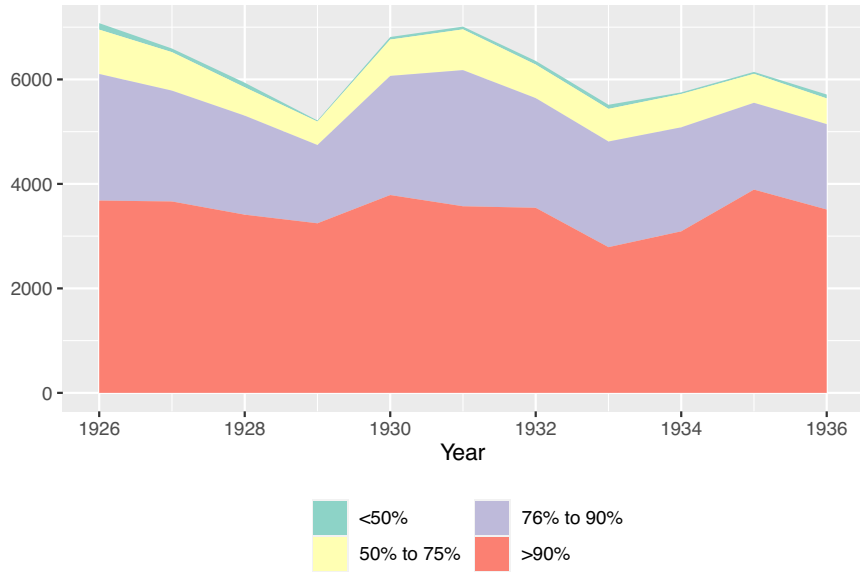

Figure 9. *The underpayment of minimum wages, 1926–1936. Notes and sources: This figure shows the number of employees that were underpaid by the fraction of the minimum wage that was paid in the United Kingdom between 1926 and 1936. The series have been calculated using information from the Ministry of Labour (1926-36).*

Productivity 1971, pp. 216-7), and trade union membership (Ministry of Labour 1937, pp. 138-9). Based on a subset of seven industries, there is not a robust relationship between the fraction of employees receiving wage changes, rises, or cuts and the fraction of employees in trade unions. The results are reported in Table A1 for models with and without fixed effects.[18] However, these results are subject to a number of caveats: the coarseness of industry-level data, the challenge of matching, and the possible bias from endogeneity.

7.3 Strikes

Hanes (1993) finds that strikes in the 1880s were associated with downward nominal rigidity in the recession of 1893 in the United States.[19] With the spectre of the General Strike of 1926 not long passed, in which 162 million workdays were lost (Ministry of Labour 1937, p. 127), firms may have been reluctant to cut wages during the British Great Depression. Figure 10 charts the number of workpeople involved in strikes and lock-outs by cause, distinguishing those due to "wage increases," "wage decreases," and "other wage questions." As the economic outlook turned south, the numbers striking over wage questions increased from less than 38,000 in 1927 and 1928 to 440,000 in 1929 and persisted above 156,000 until 1932. The vast majority of these grievances were due to wage decreases. Thus, perceived and

[18] Lags of the independent variable are also insignificant.

[19] In Sweden in the late nineteenth and early twentieth century, a significant share of strikes were caused by wage cuts (Enflo & Karlsson 2019, Enflo *et al.* 2021).

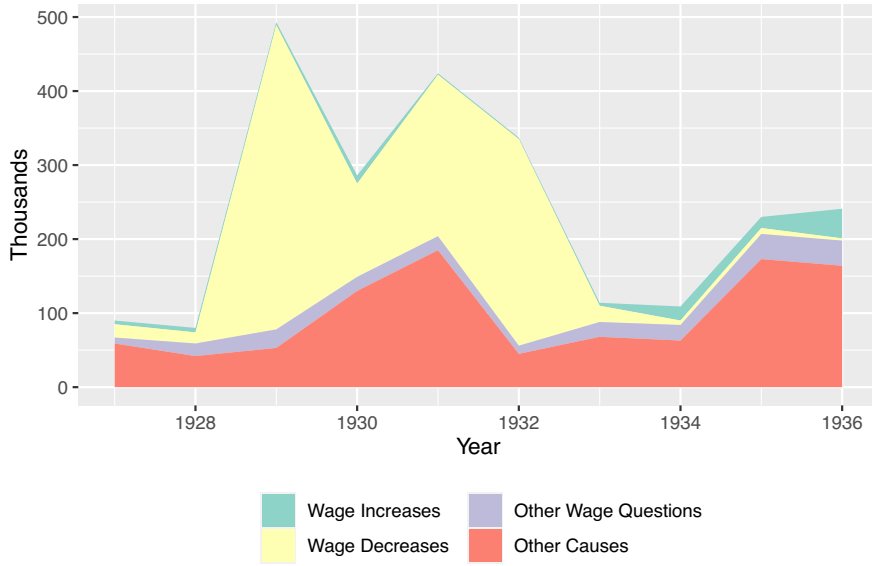

Figure 10. *The causes of strikes, 1927–1936. Notes and sources: This figure shows the number of employees directly involved in strikes and lock-outs by cause in the United Kingdom between 1927 and 1936. The series have been calculated using information from the Ministry of Labour (1937, pp. 132-3).*

realised strikes over wage cuts may have been an important cause of downward nominal wage rigidity.

7.4 Unemployment benefits

How benefits affected unemployment in interwar Britain has been a major debate in economic history (Benjamin & Kochin 1979, 1982; Broadberry 1983; Collins 1982; Crafts 1987; Cross 1982; Eichengreen 1987; Hatton 1983; Hatton & Bailey 2002; Metcalf *et al.* 1982; Ormerod & Worswick 1982). Based on macroeconometric models, some of this research suggests that unemployment benefits were a source of stickiness, providing a floor that influenced wage setting (Dimsdale *et al.* 1989; Hatton 1988b). A supporting fact is that the nominal benefits of males and females aged 21–64 years did not change between April 1928 and the outbreak of the Second World War, although the rates of young men and women (18–20 years), boys and girls (16–17 years), and dependents changed up to five times between April 1928 and March 1938 (Burns 1941, p. 368). Therefore, if benefits did provide a floor to wages, it was one that did not adjust for the majority of the labour force during the Great Depression.

7.5 Exports

During the UK trade collapse of 1929–1933, the price and quantity of exports slumped (de Bromhead *et al.* 2019). Did reliance on world markets affect the rigidity of wages? To answer this question, I match industries from an input–output table for 1935 (Barna 1952) to those from the Ministry of Labour (1937, pp. 88-91) and calculate export-output ratios for

eight industries.[20] There is a clear division between high-export industries (brick, pottery, glass, chemical, etc.; metal, engineering, and shipbuilding; mining and quarrying; textile), which had ratios between 14% and 23%, and low-export industries (building, public works contracting, etc.; clothing; gas, water, electricity, and public administration services; paper, printing, etc.), which had ratios below 5%. However, there is not a clear association between export intensity and wage cuts. For example, Table 4 shows that the high-export industries of mining and quarrying and textile had many wage cuts, but so did the low-export industries of building, public works contracting, etc. and gas, water, electricity, and public administration services.

8. Means of Adjustment

The reverse of why some wages were sticky is why others changed. In order to answer this question, I use the returns filed to the Ministry of Labour (1937, pp. 92-3), which enumerated "the methods by which changes in rates of wages were arranged." The categories are as follows: (1) By arbitration or mediation, (2) Under sliding scales: Cost of living, (3) Under sliding scales: Selling prices or proceeds of industry, (4) By standing joint bodies, and (5) By direct negotiation. The numbers reported are the "aggregate weekly amount of increases in rates of wages arranged" and "aggregate weekly amount of decreases in rates of wages arranged."

Figure 11 plots the means by which nominal wages were adjusted upwards and downwards. On average, the most common method for securing a pay rise and a pay cut was the sliding scale, of which linking wages to "selling prices or the proceeds of industry" was slightly more prevalent than to the "cost of living." The least common was by arbitration or mediation.

During the Depression, however, the mix changed. Sliding scales were still the biggest factor lowering wages, but it was the cost of living that weighed more heavily. Between 1930 and 1932, 33.7% of wage reductions were due to the automatic adjustments of sliding scales, of which 29.2% were accounted for by the cost of living and 4.5% by selling prices or the proceeds of industry. The next most common method of reducing wages was direct negotiation. Whereas 19.6% of wages had been cut in this way in the 5 years before the depression, 33.2% were directly negotiated during the slump. Other means also became more common, such as by standing joint bodies and by arbitration and mediation. The latter suggests that as the downturn became acute, the disputes became more serious and required external reconciliation.

9. Conclusion

An accepted fact in economic history is that nominal rigidity was a major amplification mechanism in the Great Depression. However, outside of the United States, the best available evidence is on average wages, which is problematic for several reasons. In this paper, I document the first estimates of nominal rigidity in interwar Britain that are comparable to those for modern economies. In order to do so, I use information on millions of wages from primary sources. My findings suggest that the British labour market in the 1930s was not especially downwardly rigid. Compared to the study by Grigsby *et al.* (2021)—a reasonably

[20] This is the only input–output table for interwar Britain.

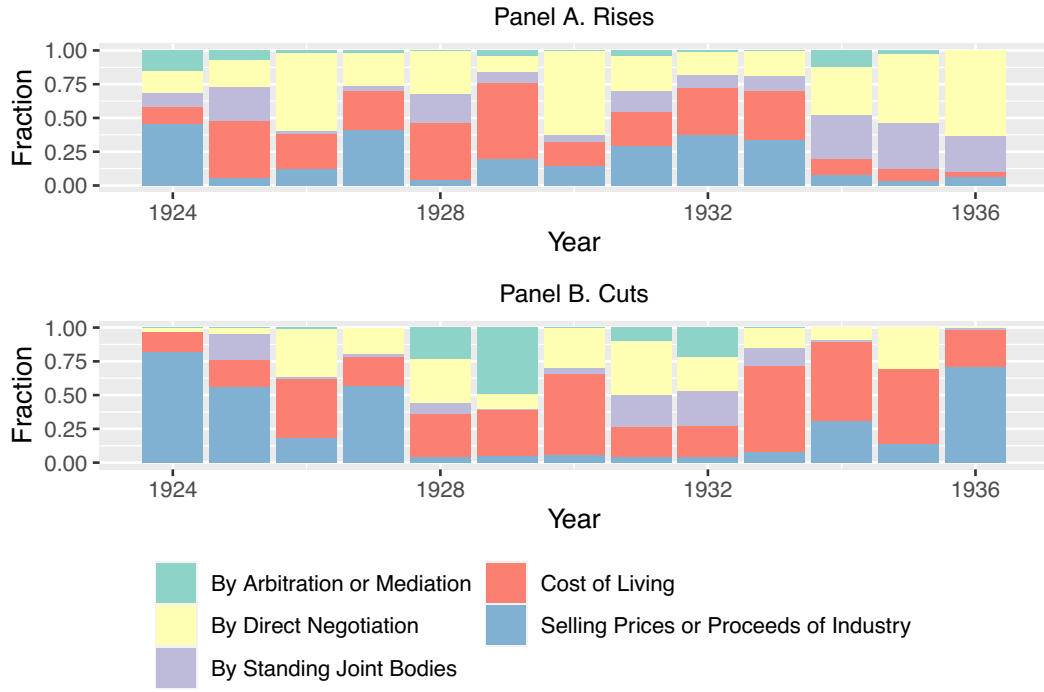

Figure 11. *The means of adjusting nominal wages, 1924–1936. Notes and sources: This figure shows the means of adjusting nominal wages in the United Kingdom between 1924 and 1936. The series have been calculated using information from the Ministry of Labour (1937, pp. 92–3).*

fair benchmark—nominal wage cuts were more frequent in the United Kingdom during the Great Depression than in the United States during the Great Recession.

In the hierarchy of aggregation, I used data somewhere between micro data on individual wages and macro data on average wages. These intermediate aggregates allowed me to calculate the same key statistics that would have been possible with the micro data but impossible with the macro data. A limitation of the aggregates, however, is that the richness of the underlying micro data is obscured, preventing the investigation of other insights and extensions.

There are a number of interesting avenues for future research. The first is to zoom in on nominal rigidity in interwar Britain by focusing on the industries excluded by the Ministry of Labour, such as agriculture and government, or on individual firms for which the necessary archival evidence survives. The second is to study nominal rigidity in the interwar period outside of the Atlantic economies of the United Kingdom and United States. The third is to go beyond documenting the degree of nominal wage rigidity to estimating the macroeconomic effects during the Great Depression.

Acknowledgments

For help and comments, I thank Brian Varian, Ivan Luzardo-Luna, Joe Hazell, Judy Stephenson, Patrick Wallis, Robin Adams, Seán Kenny, Solomos Solomou, and participants

at the Annual Conference of the Scandinavian Society for Economic and Social History. This research has been generously funded by grants from the Economic History Society and Handelsbanken.

Supplementary material

Supplementary material is available at *European Review of Economic History* online.

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