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The jobless recovery after the 1980-1981 British recession

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The jobless recovery after the 1980–1981 British recession

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Abstract

Extensive research has been conducted on the concept of jobless recoveries and their potential causes, primarily focused on the United States from the 1990s. This paper finds that the prolonged employment downturn following the brief 1980–1981 recession in Britain qualifies as a jobless recovery and then investigates possible contributing factors: labor reallocation across industries, regional employment changes, and job polarization. The United States, which did not have a jobless recovery from the early 1980s recession, is taken as a comparison case. I find that the leading candidate explanation for this jobless recovery is the reallocation of labor across industries. This suggests an important role for structural change in the early 1980s recession and in jobless recoveries more generally.

JEL classification: N14, N34, J64, E32
Keywords: jobless recovery, unemployment, industrial reallocation, job polarization, Okun's law

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1 Introduction

A jobless recovery is a recession recovery where employment growth remains stagnant or negative for an extended period after the business cycle trough. The term was coined and popularized in the United States and is typically associated with their 1990–1991, 2001, and 2007–2009 recessions. This apparent change in the character of recession recoveries after 1990 in the United States is costly for workers impacted by downturns and is troubling for policymakers aiming to maximize employment. However, the appropriate policy response depends critically on why these recent recession recoveries were jobless (Bernanke 2003). Various potential causes for jobless recoveries have been proposed, including firm restructuring over the business cycle, job polarization, structural change, and employment overhang, each with different policy implications.

It therefore remains important to determine why some recession recoveries are jobless, but the evidence to date is largely focused on the recent experience of the United States. This has limited our understanding of jobless recoveries in two ways. First, a focus on these post-1990 recessions has caused many economists to treat jobless recoveries as a wholly new phenomenon, despite little historical evidence of when jobless recoveries emerged. Many have thus sought explanations in other recent phenomena, such as job polarization and long expansionary periods, at the expense of explanations associated with more persistent factors, such as structural change, distorting our understanding. Second, there is evidence that some of the jobless recoveries in the United States were in fact because of slow output growth following the recession rather than a failure of employment growth to respond to output growth. While this may still have significant costs, these recoveries may not be the best examples of jobless recoveries in a strict sense.

I focus in this paper on the early 1980s recession in Britain, a short five-quarter recession that resulted in an unemployment rate of over 10% for seven years. I seek to answer the following questions: was the recovery from the early 1980s recession in Britain jobless, and if so, why? This is an ideal setting in which to explore jobless recoveries. The persistently high unemployment rate during the recovery stands in contrast to other signs of a strong economic recovery in Britain, such as real GDP growth and increased productivity growth.[1] In the context of these indications of a strong economic performance after the recession, the poor employment recovery seems particularly puzzling and a good candidate for a jobless recovery. Britain's employment recovery was also an outlier when compared to other OECD countries. Two years after the business cycle trough, seventeen of the twenty-one OECD countries that experienced a

[1] These data are presented in Appendix A Table 10. The output recovery is discussed in more detail in Section 3.2.

recession in the early 1980s had better cumulative employment growth than Britain, including the United States, Canada, Australia, Switzerland, and Denmark, suggesting it is appropriate to consider domestic reasons for the poor employment recovery.[2] Finally, the early 1980s unemployment episode was the most severe and persistent in Britain since the Great Depression and has had long-lasting impacts on policy and culture. Applying the jobless recovery framework to the early 1980s will advance our understanding of this historically significant unemployment episode.

To explore whether the early 1980s recession in Britain had a jobless recovery and to understand its causes, this paper marshals newly-digitized regional and industrial employment data, confidential survey data on occupations and wages, and a wealth of similar data from the United States to conduct a comparative analysis of the recovery from the early 1980s recession in Britain and in the United States. The first hypothesis I test is that the recovery from the early 1980s recession in Britain was jobless. I test this by comparing the length of the recovery to other recession recoveries in both countries. I also consider whether slow output growth, the dating of the recession, or compositional effects across regions could have created a false appearance of a jobless recovery. Then, I test three potential causes of this jobless recovery, motivated by the previous literature: the reallocation of labor across industries, regional employment shifts, and job polarization. On each of these dimensions, I evaluate the extent to which the British experience differed from that of the United States, which did not have a jobless recovery following the early 1980s recession, to determine which factor drove the jobless recovery in Britain.

I find that Britain had a jobless recovery from the early 1980s recession. It took twenty-five months for employment to stop contracting following the end of the recession and fifty-two months for employment to reach its pre-recession level.[3] During this recession recovery, there was a significant, temporary break in Okun's law for Britain, with the unemployment rate much higher than expected given GDP growth. I find that the recovery is also jobless even when offshore oil production is removed from GDP, causing the recession dates to adjust, and when compositional effects across regions are taken into account. The early 1980s recession in Britain is thus a good example of a large jobless recovery.

The comparative analysis indicates that the leading candidate explanation for this jobless recovery is the rapid reallocation of labor across industries. Estimates of the scale of labor reallocation across industries indicate that structural change was more significant in Britain than in the United States, especially the decline of manufacturing and the increase in banking and finance. Both countries also experienced

[2]This analysis is presented in Appendix A Table 4.

[3]In contrast, in the United States it took only two months for employment to stop contracting after the trough and only four months for employment to reach its pre-recession level.

substantial shifts in patterns of employment across regions during this period, but a dynamic shift-share analysis indicates that, unlike in the United States, the regional employment changes in Britain were driven by industrial mix.

Job polarization is the trend for routine, "middle-skill" occupations to disappear in the labor market as the employment share of non-routine service or manual jobs increases at the low end of the skill or wage distribution, while the share of jobs using abstract non-routine skills increases at the high end of the distribution. My results indicate that job polarization does in fact appear to have been more significant in Britain than in the United States in the early 1980s, regardless of whether it is measured through the changing composition of tasks in the economy or shifts in the relative share of employment in occupational deciles. But, a decomposition indicates that a large portion of this polarization was between industries rather than within industries, suggesting again that labor reallocation across industries was the key factor rather the occupational polarization within industries. Taken together, the conclusion is that a key driver of the early 1980s jobless recovery was the reallocation of labor across industries.

These results contribute to the existing literature on the causes of jobless recoveries in three ways. First, this paper establishes that Britain had a jobless recovery from the early 1980s recession, indicating that jobless recoveries are not just a post-1990 phenomenon. This raises questions about general explanations for jobless recoveries based on post-1990 phenomena such as the moderation of business cycle volatility (Garin et al. 2018), liquidity traps (Schmitt-Grohé and Uribe 2017), declining business dynamism (Pugsley and Sahin 2019), reduction of unionization (Berger 2018), increased unemployment benefits (Mitman and Rabinovich 2014), and increased globalization (Waddle 2019). This also weakens support for theories that jobless recoveries emerge from firm or labor market dynamics over the business cycle (Koenders and Rogerson 2005; Bachmann 2012; Penrose 2009; Berger 2018). These typically require firms to accumulate staffing inefficiencies throughout a long expansionary period, which was not the case prior to the early 1980s recession in Britain.

Second, this paper directly tests two leading explanations for jobless recoveries, industrial reallocation and job polarization, and further advances the analysis of industrial reallocation by considering the interaction of reallocation across regions and industries. Structural change characterized by the reallocation of labor across industries was first put forth as an explanation of jobless recoveries by Groshen and Potter (2003), following a broader literature on the impact of industrial reallocation on recessions (Lilien 1982; Abraham and Katz 1986; Campbell and Kuttner 1996; Chodorow-Reich and Wieland 2020, for example),

and has since been widely debated and criticized (Aaronson et al. 2004; Olney and Pacitti 2017; Garin et al. 2018). Recent work has focused more on job polarization as a potential cause of jobless recoveries (Jaimovich and Siu 2020; Gaggl and Kaufmann 2020; Burger and Schwartz 2018; Graetz and Michaels 2017). The present paper contributes to this literature by providing evidence that the reallocation of labor across industries was a key driver of the early 1980s jobless recovery in Britain, even once regional changes are taken into account, and not job polarization.

Third, this paper adds to a broader discussion on the definition of jobless recoveries. Jobless recoveries are typically assumed to represent a shift in the relationship between the unemployment rate and output growth, captured by Okun's law. Galí et al. (2012) argue that, in contrast, the post-1990 jobless recoveries in the United States were driven by the slow growth in output and would therefore be better termed "slow recoveries." There is continued debate on whether the three post-1990 jobless recoveries in the United States were true jobless recoveries with a shift in Okun's law or were just because of slow output growth (Ball et al. 2017; Gordon 2010; Elroukh et al. 2020, for example). The results in the present paper indicate that, unlike in the United States, there was a clear, temporary shift in Okun's law during the early 1980s recession and recovery in Britain, using the econometric tests performed in Ball et al. (2017). This indicates that the jobless recovery in Britain was a jobless recovery in the strictest interpretation of the term, where employment growth did not track with output growth, and makes the finding that structural change may have contributed to this jobless recovery especially valuable in the broader conversation about possible causes of jobless recoveries.

Lastly, this paper contributes to our understanding of this significant recession and recovery in British economic history, demonstrating the important role of structural change. This speaks to a broader literature on the relationship of structural change and the business cycle, which is a continued area of interest theoretically and in other British recessions (Sahin et al. 2014; Chodorow-Reich and Wieland 2020; Paker 2021).

The paper proceeds as follows. Section 2 gives a brief historical background on Britain and the United States in this period. Section 3 tests the hypothesis that the early 1980s recession in Britain had a jobless recovery, finding that this was indeed the case. Section 4 describes the broad comparative approach to testing three possible causes of this jobless recovery: industrial reallocation, regional employment shifts, and job polarization. Section 5 describes the data for the analysis. Section 6 describes the empirical methods in more detail. Section 7 presents the results, which indicate that the leading candidate explanation for

the jobless recovery is the reallocation of labor across industries. Section 8 gives a brief conclusion.

2 Historical Background

The early 1980s recession was a global downturn, but its effect on employment in Britain was particularly severe and prolonged. The recession occurred from the first quarter of 1980 through the first quarter of 1981. Figure 1 shows that the unemployment rate climbed from 5.5% before the recession to a new peak of 11.9% in the spring of 1984. From there, the unemployment rate decreased so slowly that it was still over 10% through the third quarter of 1987.

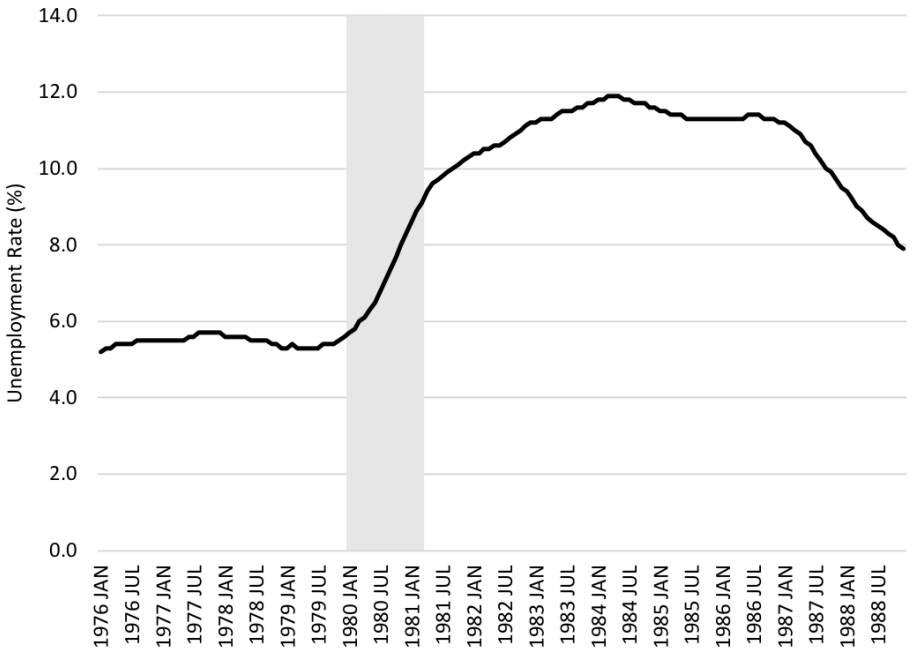
The early 1980s recession in Britain is associated with two interconnecting storylines: the 1979 oil crisis and the Thatcher government's efforts to control inflation. These forces not only helped bring about the early 1980s recession, but they also shaped the monetary and fiscal policy response to the economic downturn.

The 1979 oil crisis was caused by decreased oil output in the Middle East owing to the Iranian Revolution. This led to a 7% decrease in the global oil supply (Graefe 2013). Panic conditions driven by the energy crisis caused the price of oil to double from the spring of 1979 to the spring of 1980. The oil supply continued to fall after Iraq invaded post-revolutionary Iran, but this decrease was met by increased output from other oil fields in Siberia, the Gulf of Mexico, Alaska, and the North Sea. Britain was partially shielded from the effects of the 1979 oil crisis by domestic oil production. Oil production had increased in Britain after the 1973 oil crisis, and Britain became a net exporter of oil in 1980 – right in the middle of the recession and oil crisis.[4] While industries relying on oil as an energy input for production were still disadvantaged by the price shock, the increased value of oil production benefited national income.

Britain struggled with inflation throughout the 1970s, instituting various wage and price controls to try to slow the growth of the price level. In the mid-1970s, the climate of inflation caused the pound to depreciate against the dollar. Attempts to support the value of the pound forced the Labour Government, headed by James Callaghan, to request a $3.9 billion bailout loan from the IMF (Burk 1989). The IMF imposed strict conditions on this loan, including cuts in government spending and the deficit. Britain took their first steps toward monetarist policies, which had been coming into vogue, by also committing to suggested money supply targets (Goodhart 1989). These were then taken as formal targets by the financial sector (Davies 2012).

[4] See Figure 11 in Appendix A.

Figure 1: Unemployment rate in Britain, 1976–1988



ONS unemployment rate series [MGSX]. Note that this is the standard series based on the Labour Force Survey (LFS) and not the claimant count that was widely cited in the early 1980s.

With inflation still a problem, the Callaghan government set new guidance in 1978 limiting public-sector pay rises to 5%. This was met by intense trade union opposition. Over the "Winter of Discontent" from 1978 to 1979, strikes and walkouts were held in both private and public sector industries to negotiate pay rises well above 5%. As a result of this industrial action, 20 million more working days were lost to industrial disputes in 1979 than in 1978.

The Conservative Party led by Margaret Thatcher came to power in May of 1979. The Thatcher government was committed to reducing inflation and had no hesitation about pursuing monetarist policies to achieve that goal. Inflation had increased from 8.4% to 17.2% from December 1978 to October 1979. To meet the monetary targets, interest rates were increased to 17% in November, which contributed to the start of the recession in early 1980. The high interest rates also attracted foreign capital inflows — by the end of 1980, the real exchange rate had appreciated 30% over its level at the end of 1978 (Maynard 1988, p. 60). Though these policies had consequences for unemployment, throughout 1980 and 1981 the Thatcher government attributed unemployment to high wage demands and a correction of "overmanning" in unproductive industries (Rieger 2018, pp. 649-650).

In 1980, the Thatcher government introduced the Medium Term Financial Strategy (MTFS), which presented a serious commitment to long-term monetarism and inflation reduction. Targets for the money

supply were given for the next four years, as well as fiscal targets to reduce the amount of public-sector borrowing. In the second half of 1980, the monetary targets were temporarily abandoned to lower interest rates given the scale of the recession. The 1981 budget aimed to get the MTFS back on track with severe fiscal tightening. The government targeted an almost 1.5 percentage point decrease in public sector borrowing as a percent of GDP through increased taxes and cuts in government spending. The continued monetarism and fiscal conservatism outraged some economists, who responded by publishing a public statement expressing their discontent in *The Times* on March 30, 1981.[5] The worst fears of these economists were not realized, though, as the economy turned around sharply in the second half of 1981. Interest rates were lowered, inflation fell dramatically, and output growth brought the recessionary episode to a close. The Thatcher government continued to focus on fiscal restraint, but monetary targeting was no longer the central aim of the government's policy. A senior policy adviser in the Thatcher government, reflecting on the 1979–1981 period, wrote that they had "accidentally engineered" the recession through their monetarist policies and thus had "done the economy a great deal of damage by mistake" (Hoskyns 2000, pp. 263, 269, cited in Needham (2015)).

2.1 Comparison with the United States

The United States' experience paralleled that of Britain during the early 1980s recession, making it a valuable comparison case. Both countries experienced a recession starting in 1980, though the United States had a "double-dip" recession with two output troughs and a short period of growth between them. Each dip of the double-dip recession in the United States represented about half of the peak-to-trough percent decrease in GDP for Britain, making the recession in the United States and Britain broadly comparable.[6] The unemployment rate reached during the recession was also similar for both countries at about 10%. However, while employment recovered almost immediately in the United States, the unemployment rate continued increasing after the end of the recession to almost 12% in Britain. The timing of the end of the recession also differs – the second "dip" of the United States recession occurs after the recession concluded in Britain.

The United States was also shielded somewhat from the effects of the 1979 oil crisis by domestic oil production. As in Britain, domestic oil production in the United States was made more profitable by the 1973 oil crisis. Domestic oil production increased in the late 1970s as the Trans-Alaskan pipeline

[5]Statement printed in David Blake, "Monetarism attacked by top economists." *Times* [London, England] 30 Mar. 1981: 1. *The Times Digital Archive.*

[6]These statistics are given in Appendix A Table 5.

was operationalized, the Prudhoe Bay oil field was developed, and the industry was deregulated under the Carter and Reagan administrations. While the United States did not become a net exporter of oil, net exports became less negative leading up to the 1979 oil crisis, putting them in a similar (though less advantageous) position to Britain.[7]

Like Britain, the United States also faced a significant challenge in combating inflation. The United States also tried wage and price controls in the 1970s and began experimenting with monetarism. Soft targets for monetary aggregates were set in 1975 and initially extended one quarter at a time. In 1978, the Humphrey-Hawkins Act required the Federal Reserve to set annual targets and report on their progress to Congress. As in Britain, this foray into monetarism was flexible at first. Though inflation was high in the 1970s in both countries, it was greater in Britain than in the United States.

After inflation increased dramatically in 1979, averaging 10.75% from January to September, the Fed held a secret meeting in October to change policy (Walsh 2004). Under Chairman Volcker, the Fed determined that they needed to limit inflationary expectations by committing to quarterly targets for money supply growth and allowing interest rates to increase to the level needed to meet the targets (Walsh 2004). As a result, interest rates increased dramatically through the end of 1979, peaking in April 1980 at 17.6% (Walsh 2004). This monetarist policy was very similar to that pursued by the Thatcher administration at the same time. In both countries, the high interest rates contributed to the start of the recession in 1980.

The United States did not have as strong an emphasis on fiscal measures to control inflation as Britain. However, the Carter administration did introduce the Special Credit Restraint Program (SCRP) in March of 1980. This so effectively limited money supply growth by restricting credit creation that interest rates, at that time left to adjust to meet the new money supply targets, actually fell. The Fed then had to override its money supply targeting system to keep monetary policy tight (Hetzel 1986). Their correction ended up overshooting, leading interest rates to reach 19.0% in July 1981 and starting the second dip of the recession (Walsh 2004). Monetary policy was loosened, and eventually monetary targeting was abandoned with the end of the recession in 1982.

After facing difficulties controlling inflation in the 1970s, the United States and Britain thus both experimented with monetarism over the 1979–1981 period, a broadly similar monetary policy response to the challenges of inflation and recession. Taken with their domestic oil production and the similar dates

[7]This is shown in Appendix A Figure 12.

and scale of their recessions, the United States makes an interesting comparison case for Britain during this period.

3 The Jobless Recovery from the Early 1980s Recession

This section tests the hypothesis that Britain had a jobless recovery following the early 1980s recession by comparing the length of the recovery to other recessions in both Britain and the United States. The results of this analysis indicate that Britain did experience a jobless recovery from the 1980–1981 recession. Then, I address various counterarguments that could explain this evidence without the presence of a jobless recovery, including slow output growth, issues with recession dating, and compositional effects. I find that none are sufficient to explain the observed patterns, demonstrating that there was indeed a jobless recovery.

3.1 Length of recession recoveries

Jobless recoveries are typically associated with the United States' 1990–1991, 2001, and 2007–2009 recessions, which were all followed by a lengthy employment recovery after the trough. For example, after the 2009 Great Recession in the United States, it took over a year after the end of the output recession for employment to stop contracting, and then another four years for employment to reach its pre-recession level. These three recessions are often contrasted to the mid-1970s and early 1980s recessions in the United States, which all had strong employment recoveries from about two months after the trough.[8] Because of these three apparent jobless recoveries, most research on jobless recoveries has focused on the United States, and little is known about jobless recoveries in other developed countries.[9]

A standard way to identify jobless recoveries is to count the number of months it took for employment to rebound after the output trough of the business cycle was reached. Jaimovich and Siu (2020, p. 132) find that before 1990, it took 4 months on average for employment to expand after a recession in the United States, while in the recessions with jobless recoveries it took 21 months on average. They also count the number of months it took for employment to recover to the level it was at when the recessions ended, finding that before 1990, it took 10 months on average, while during the jobless recoveries it took 54 months on average.

Taking these numbers as a guide, we can do similar calculations for recent British recessions and

[8] These patterns are shown in Appendix C Figure 13.
[9] Graetz and Michaels (2017) is a notable exception.

Table 1: Employment recovery after recessions, Britain and the United States

	1973–1975	Early 1980s	Early 1990s	Early 2000s	2008–2009
United States					
months to turnaround	4	2	17	23	23
months to trough level	10	4	31	55	76
Britain					
months to turnaround	11	25	25	-	8
months to trough level	32	52	50	-	9

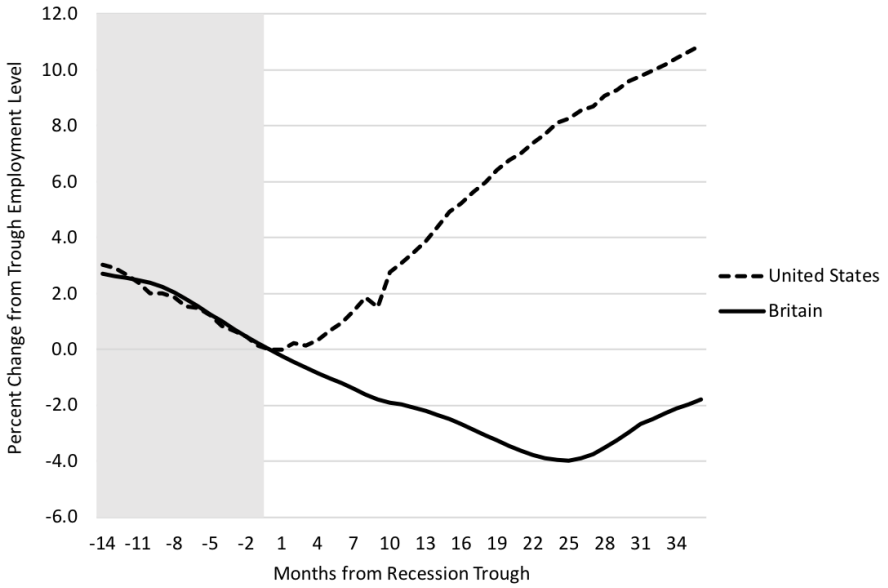
US entries from Jaimovich and Siu (2020), where the trough date for the double-dip US recession is for the second dip in 1982. Entries for Britain are author's calculations based on ONS number of people in employment series [MGRZ]. Britain did not have an early 2000s recession.

compare them to the recessions in the United States. The first two rows of Table 1 give the calculations from Jaimovich and Siu (2020) for the United States. The final two rows give the same calculations for Britain. Unlike in the United States, there is not a stark divide between pre-1990 and post-1990 recessions in Britain. Rather, the early 1980s recession in Britain stands out as an early example of a jobless recovery. It took 25 months for employment to stop contracting after the end of the recession in Britain, and it took 52 months for employment to recover to the level it had been at the business cycle trough. These numbers match the speed of recovery in the three United States jobless recoveries, indicating that Britain had a jobless recovery from the early 1980s recession.[10]

The employment recovery following the early 1980s recession in Britain appears especially slow when compared to the employment recovery in the United States from that recession. Figure 2 gives the change in employment from the level at the end of the recession in the United States and Britain. Employment rebounded rapidly in the United States after the end of the recession, but it continued to decline for many months in Britain. Britain and the United States are thus a good comparison case for the early 1980s recession, as it is clear that Britain had a jobless recovery from the recession while the United States did not.

[10]The early 1990s recession in Britain also stands out as another potential example of a jobless recovery, though beyond the scope of this paper.

Figure 2: Employment growth after the early 1980s recession, Britain and the United States



Analysis using BLS total nonfarm payroll series [PAYEMS] and ONS number of people in employment series [MGRZ]. The trough date for the US is November 1982 and the trough date for Britain is March 1981.

3.2 Other possible explanations for these patterns

Slow output growth and Okun's law

The literature on jobless recoveries in the United States often assumes that jobless recoveries involve a temporary change in the standard relationship between output growth and employment after recessions. This relationship is typically characterized by Okun's law, which says that a 1% increase in output is associated with about a 0.5 percentage point decrease in the unemployment rate.[11] A jobless recovery where output recovers as normal but employment does not immediately recover suggests a shift in the relationship between output and employment posited in Okun's law.

However, Okun's law also implies that slow output growth during a recovery should lead to slow employment growth. Without any change to Okun's law, the patterns observed in a jobless recovery could occur simply because of weak output growth during a recession recovery. Slow employment growth following a recession would thus not be an anomaly but rather an expected feature of recessions with weak output recoveries. Galí et al. (2012) argue that this was the case in the three United States jobless

[11] There are various other empirical estimates for the Okun's coefficient, typically slightly lower than this. A common way of estimating the Okun's coefficient relates changes in the unemployment rate gap to changes in the output gap.

recoveries, suggesting they should instead be called "slow recoveries." This continues to be a matter of debate for the United States (Ball et al. 2017; Gordon 2010; Elroukh et al. 2020, for example).

It is therefore important to distinguish if the jobless recovery patterns observed for Britain after the early 1980s recession can be explained by slow output growth or if there was a true break in the relationship between output growth and employment. To test this, I replicate for Britain the analysis of the United States in Ball et al. (2017). They find that Okun's law was stable in the United States since 1948, implying there were no jobless recoveries. I find that, in contrast, for Britain there appears to be a temporary change in Okun's law during the 1980s. Figure 3 shows that there are large differences between the actual unemployment rate and the unemployment rate predicted by Okun's law (estimated to have a coefficient of −0.40 for Britain from 1971–2019). From 1983 through 1986, the unemployment rate was about two percentage points higher than expected based on Okun's law, indicating a shift in the relationship between unemployment and output.

The 1980s period looks anomalous regardless of whether raw changes in unemployment and output are used or changes in the unemployment and output gap. This is robust to quarterly or annual data and various Hodrick-Prescott filter parameters.[12] In every specification, structural break tests also indicate a structural break in the relationship between output and employment in 1981. In general, the Okun coefficient for the jobless recovery period is estimated to be of a larger absolute value than in the periods before or after, indicating that for the size of the output gap, the unemployment rate gap is higher than expected.

These results demonstrate that the early 1980s recession recovery did not just appear jobless because of slow output growth. Instead, it was a jobless recovery with a temporary shift in the Okun's law relationship between output and the unemployment rate. Thus, it is not only appropriate but also valuable to study the possible causes of the early 1980s jobless recovery in Britain, as this jobless recovery is clearly anomalous and is not just driven by slow output growth.

Recession dating and North Sea oil

A related concern is that, if a business cycle trough actually occurred at a later date than the one used in the analysis, one could falsely believe the economy was in a jobless recovery when in fact it was just in an extended recession. This makes it important to clearly establish the dating of the output recession.

[12] The complete analysis is given in Appendix D.

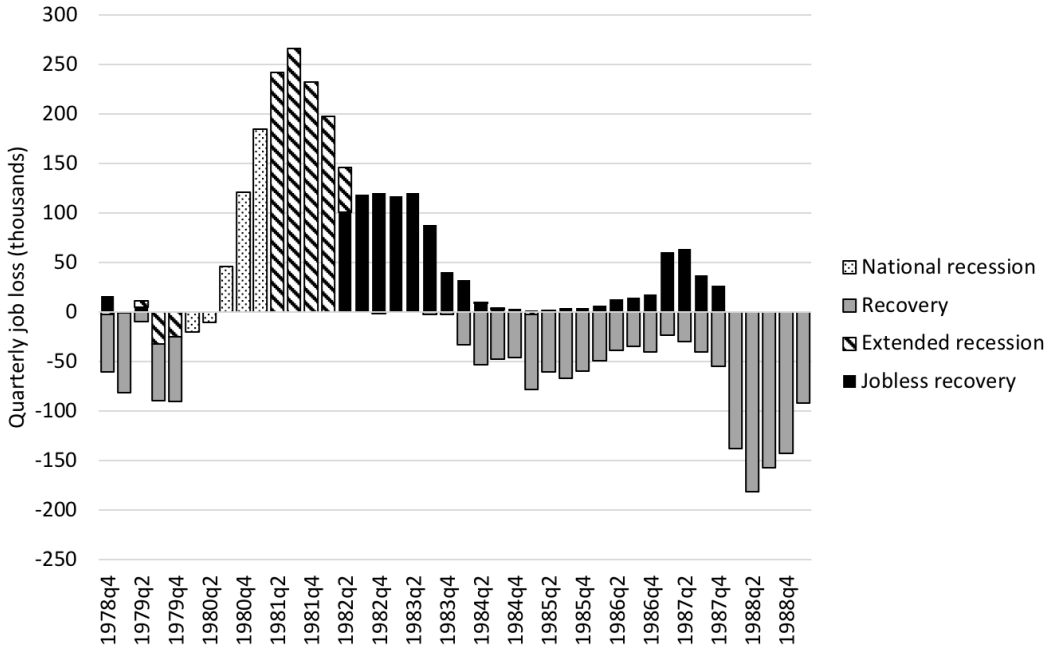
Figure 3: Actual and Okun's law predicted unemployment rates, 1971—2018

Analysis using ONS unemployment rate series [MGSX] and GDP series [ABMI]. Figure reports the actual unemployment rate and the unemployment rate from Okun's specification estimated on annual data in levels. The unemployment rate gap residuals plus the natural unemployment rate gives the predicted unemployment rate. Potential output and natural rates based on Hodrick-Prescott filter with $\lambda = 1000$. The full model coefficients are given in Appendix Table 6 Column (3). The dotted vertical lines demarcate the early 1980s recession.

The early 1980s recession in Britain is typically considered to have been five quarters long, from the first quarter of 1980 through the first quarter of 1981. However, one might be concerned that production had not actually begun expanding in a meaningful way after the first quarter of 1981. The national GDP estimates on which the traditional recession dates are based include oil output from Britain's Continental Shelf. It is possible that North Sea oil production inflated output growth during this time and that on-shore production remained in an extended recession, obviating the jobless recovery.

Koop et al. (2020) reconstruct quarterly GVA estimates by region back into the 1970s, excluding production from the Continental Shelf. Their estimates suggest that the national recession was only two quarters longer than traditionally thought, through the third quarter of 1981, when off-shore production is excluded. Additionally, their estimates by region show that all regions experienced output expansion by early 1982. Thus, even with more generous recession dates, the recovery from the early 1980s recession was jobless for at least a year.

Figure 4: Quarterly job loss in Britain decomposed by recovery status of region, 1978–1988



Analysis using quarterly GVA data from Koop et al. (2020) and quarterly regional employment data from the 1987 and 1989 *Employment Gazette* Historical Supplements. Total job losses in each quarter are disaggregated by region and then classified according to whether the region was experiencing an extended recession, a jobless recovery, or employment growth.

Compositional effects

Another concern is compositional effects. National output measures are composed of the output from different regions of a country. It is possible for the national output to show that a recession is over because of a strong recovery in some regions, even though other regions still face recession conditions. Burger and Schwartz (2018) find that these compositional effects played a role in the early 1990s and early 2000s recession recoveries in the United States. The national jobless recovery phenomenon could thus be partially attributed to output figures improving in some regions while employment recovery dragged in other regions.

Using the regional GVA data from Koop et al. (2020), it is possible to explore whether compositional effects played a role in the early 1980s jobless recovery in Britain. Figure 4 demonstrates that compositional effects did not drive this jobless recovery. Total job losses in each quarter are disaggregated by whether they occurred in a region experiencing an extended recession, a jobless recovery, or employment growth. Regions were in an extended recession if they had both output and employment contraction even after the national business cycle trough, in a jobless recovery if they had output growth but employment contraction, and in a traditional recession recovery if both output and employment were expanding.

Figure 4 shows that all regions had extended recessions through the second quarter of 1982 based on the Koop et al. (2020) GVA data. Subsequently, a jobless recovery occurred uniformly in regions through the third quarter of 1983. While a jobless recovery continued in some regions through 1987, other regions began seeing employment recovery during those years. Thus, while compositional effects are important to consider when classifying a recession recovery as jobless, it is clear that the recovery from the early 1980s recession in Britain was uniformly jobless for almost two years.

4 Theoretical Framework

Now that it is established that Britain had a jobless recovery from the early 1980s recession, we turn to testing various possible explanations for why this occurred. The results in the previous section are already important because they push back the date at which jobless recoveries may have emerged, from the 1990s to the early 1980s. Many potential causes of jobless recoveries that are discussed in the literature focus on post-1990 trends in order to explain the sudden emergence of jobless recoveries in the 1990s (Garin et al. 2018; Schmitt-Grohé and Uribe 2017; Pugsley and Sahin 2019; Berger 2018; Mitman and Rabinovich 2014; Waddle 2019). These post-1990 causes cannot explain why we observe a jobless recovery in Britain from 1981, raising questions about their usefulness in explaining jobless recovery patterns more generally. This jobless recovery also cannot be explained by countercyclical firm restructuring, as this typically requires a long expansionary period prior to the recession, which did not occur in Britain (Koenders and Rogerson 2005; Bachmann 2012; Penrose 2009; Berger 2018).

This paper instead focuses on testing three other potential explanations for jobless recoveries from the literature: labor reallocation across industries, regional employment shifts, and job polarization. In each case, the experience of Britain in the 1980s is compared to that of the United States in the 1980s, which did not have a jobless recovery from the recession. This approach allows us to identify the key differences between the countries that may have driven their different recovery experiences from the early 1980s recession.

Labor reallocation across industries could cause the employment recovery to take more time after a recession because reallocation takes longer than simply recalling workers from temporary layoffs or rehiring workers in the same industries. Reallocation requires new jobs to be created in different sectors and often involves costly search, retraining, or mobility for workers that are moving between industries. As the composition of industries changes in the economy, entirely new groups of workers might also be brought

into the labor supply. These adjustments can all slow the responsiveness of employment to output growth following a recession.

Structural changes in the industrial composition of the economy have long been associated with increased unemployment during recessions (Lilien 1982; Abraham and Katz 1986; Campbell and Kuttner 1996; Chodorow-Reich and Wieland 2020, for example). Structural change also remains a leading explanation for jobless recoveries in the literature, though its role is widely debated (Groshen and Potter 2003; Aaronson et al. 2004; Olney and Pacitti 2017; Garin et al. 2018). A large amount of industrial reallocation in Britain in the early 1980s could thus help explain the slow employment recovery, especially if similar levels of reallocation did not occur in countries with fast employment recoveries like the United States.

Relatedly, one of the major narratives to emerge from the early 1980s recession and recovery in Britain was the growing divide between the economic performance of the South of England, led by London and the surrounding areas, and the North of England, Scotland, and Wales (Lewis 1989). While most of the jobless recovery literature has focused on the reallocation of labor across industries, the reallocation of labor across geographies is a similarly slow and costly process that could contribute to a jobless recovery. Because different regions have different industrial compositions, it is also important to analyze how regional effects may have interacted with industrial reallocation. If regional effects were larger in Britain than in the United States, this could suggest that the jobless recovery was because of changes in the patterns of employment across regions.

Finally, job polarization may cause jobless recoveries. Job polarization is the trend of routine, middle-skill occupations becoming less prevalent in the economy. The center of a skill or wage distribution of jobs hollows out as the employment share of non-routine manual or service jobs increases at the low end of the distribution (such as jobs in home health care or child care), while the share of jobs using abstract non-routine skills increases at the high end of the distribution (such as jobs in computer programming and data analysis). This creates an "hourglass" labor market with fewer opportunities for middle-skill workers concentrated in occupations involving routine tasks. These occupations involving routine tasks can be primarily manual, such as factory work or machine operation, or cognitive, such as secretarial work, bank telling, or data entry.

Job polarization in the United States is typically understood to have begun in the late 1980s or early 1990s, therefore coinciding with the emergence of jobless recoveries in the early 1990s.[13] Jaimovich and

[13] Acemoglu and Autor (2011) write "During the 1980s (1979–1989), employment growth by occupation was nearly monotone in occupational skill; occupations below the median skill level declined as a share of employment and occupations above the

Siu (2020) argue that jobless recoveries occur because of job polarization, as employment fails to recover in routine occupations. Other researchers have also found a link between job polarization and jobless recoveries (Gaggl and Kaufmann 2020; Burger and Schwartz 2018; Graetz and Michaels 2017).

There is some evidence that suggests that job polarization was occurring in Britain in the 1980s (Goos and Manning 2007; Salvatori 2018; Cristini et al. 2018), as well as evidence from longer-run studies that it was occurring by the early 1990s (Goos et al. 2009, 2014). Because job polarization may have started earlier in Britain than in the United States, it could have caused the jobless recovery from the early 1980s recession. It is therefore important to consider job polarization specifically over the early 1980s recession and recovery period and to explore if, and to what extent, job polarization may have contributed to the early 1980s jobless recovery.

5 Data

To shed light on the drivers of Britain's jobless recovery from the early 1980s recession, our goal is to compare Britain and the United States in terms of their industrial reallocation, regional employment shifts, and job polarization in the early 1980s. This requires similar data from both countries on employment by industry and geographic area for the analysis of labor reallocation across industries and regional change, as well as detailed occupational and wage data for the analysis of job polarization.[14]

In Britain, the workforce jobs series from the Office of National Statistics (ONS) gives detailed employment data by industry and region. The workforce jobs estimates are establishment-based, relying primarily on surveys sent to businesses and employers in the private and public sectors. The workforce jobs data by industry and region is only available from the ONS starting in 1981, limiting its usefulness for exploring the early 1980s recession.

The precursor to this series, however, was published in the *Employment Gazette* during the 1970s and early 1980s, covering the entire period of interest. Printed tables in the Historical Supplement to the *Employment Gazette* conveniently summarize these monthly publications. I digitized Table 1.5 of the 1987 and 1989 Historical Supplements, creating a dataset with quarterly employment by industry and region for the entire recession and recovery period.

median increased. In the subsequent decade, this monotone relationship gave way to a distinct pattern of polarization" (p. 1071).

[14] All data and replication files, including detailed documentation, are available on openICPSR at `https://doi.org/10.3886/E193213V3`, see (Paker 2023).

Industrial employment data is available for the United States in the Quarterly Census of Employment and Wages (QCEW). Like Britain's workforce jobs data, the QCEW is establishment-based, constructed from unemployment insurance records and business surveys. Quarterly employment data is available on the state and county level from 1975 for detailed industry categories, thus spanning the entire recession-recovery period. Though the QCEW provides the best estimate of short-term changes in the industrial composition of employment, at very refined geographic areas and industry categories, some employment estimates are "non-disclosed" for privacy reasons.[15] The US data is limited to the private sector throughout in order to minimize the effect of disclosure restrictions.[16]

For the analysis of job polarization, detailed occupational and wage data is required for both Britain and the United States. Following the literature on job polarization, the data for Britain come from the Annual Survey of Hours and Earnings (ASHE), previously called the New Earnings Survey (NES). The longitudinal ASHE data is available as a confidential dataset from the ONS Secure Research Service. This dataset contains about 300,000 observations per year, taken as a 1% sample from HM Revenue and Customs records of employee payrolls. The data contain information on wages and hours worked that are linked to employees' occupations, industries, and demographic characteristics, allowing for a detailed analysis of job polarization.

Similar data is available for the United States from the Current Population Survey (CPS), which is the monthly labor force survey used to generate national labor statistics. Data from the May Supplement Files gives occupations, hours worked, and earnings for the years 1979–1987. The occupation codes are standardized using the data files from Autor and Dorn (2013).

6 Empirical Methods

6.1 Labor reallocation across industries

A large amount of industrial reallocation in Britain in the early 1980s could explain the jobless recovery, especially if similar levels of reallocation did not occur in the United States. To evaluate the role of structural change in the jobless recovery, we therefore need to establish how the industrial structure of

[15] Appendix B gives more details on how disclosure restrictions were handled.

[16] The public administration and defense sector is excluded for both the United States and Britain throughout the paper. Nationalized British industries in other sectors are included, as this represented a large share of British employment and unemployment in the 1980s. Nationalized industries were uncommon in the United States, so all public sector employment is excluded.

both countries changed during this period. If the industrial structure changed more in Britain than in the United States, this suggests that labor reallocation across industries may have contributed to Britain's jobless recovery.

The most straightforward way to capture changes in the industrial structure is to simply graph the percent change in employment in each sector during and after the early 1980s recession, standardized to the quarter just before each country's recession. If we see large and persistent changes in industrial employment in one country and not the other, that suggests that structural change was more significant in the former.

However, some industries are more sensitive to the business cycle than others and are therefore more likely to experience temporarily high unemployment during a recession. To capture more permanent structural changes, it is important to net out these temporary cyclical effects. This complicates the comparison between Britain and the United States because, while it took years after the end of the recession for employment to recover to its pre-recession level in Britain, the United States had a relatively rapid recovery. Our second test therefore captures changes in the share of employment in each country over their specific recession-recovery period in terms of employment. For each country, a snapshot of the industrial employment composition in the quarter just before the recession is compared to the quarter in which national employment recovered to its pre-recession level.[17] Any changes in the industrial composition observed are thus more likely to be permanent structural changes rather than temporary cyclical effects.

6.2 Regional employment shifts

To evaluate the role of regional employment shifts in the early 1980s jobless recovery in Britain, we can compare whether regional effects were greater in Britain than in the United States. If there were larger changes in regional employment in Britain, this suggests that regional reallocation may have contributed to Britain's jobless recovery.

To capture simple changes in regional employment shares in Britain and the United States, I conduct a similar analysis as for changes in the industrial structure. I graph the percentage change in employment in each region after the early 1980s recession and analyze changes over the full recession-recovery cycle to net out any temporary cyclical effects.

However, it is important to consider the extent to which these regional employment patterns just

[17] These dates are 1979Q4 and 1987Q3 for Britain, and 1979Q4 and 1983Q3 for the United States.

reflected the changing industrial structure. For example, if a region is dominated by an industry that then declines in employment, that region will see a decrease in its employment share because of labor reallocation across industries and not owing to specific features of that region. I first measure the extent of industrial reallocation within each region by capturing the dispersion in employment growth rates across industries within a geographic area. In each area a, the level of industrial reallocation $R_{a,t}$ from time $t-1$ to t is given by the mean absolute deviation of employment growth across industries. This is calculated in the standard way as

$$R_{a,t} = \frac{1}{N} \sum_{i=1}^{N} |g_{a,i,t} - m_{a,t}|$$

for N industries i where $g_{a,i,t}$ is employment growth in industry i in area a from time $t-1$ to t, and $m_{a,t}$ is the mean employment growth rate across all industries i in area a over the same time period.

A higher mean absolute deviation indicates that, on average, that geographic area has more dispersion in employment growth across industries, indicating a higher level of industrial reallocation. The value $R_{a,t}$ is easy to interpret as the average difference between industries' employment growth and the mean employment growth in the area. The first test is thus to compute this measure for regions in Britain and the United States to observe if there are differences in patterns of industrial reallocation across regions.

The second key test of whether regional effects contributed to the jobless recovery in Britain is a dynamic shift-share model. This can fully decompose regional employment changes to identify the role of regional effects above and beyond differences in the industrial composition of regions. In a traditional shift-share model, the changes in employment in a region are decomposed into three effects: a national growth effect, an industry mix effect, and a regional share effect. The national growth effect captures how employment in the region would change if it followed the path of the national economy. The industry mix effect takes into account the national performance of the industries in the region. The regional effect is the residual, which is the change in employment in the region owing to regional factors other than the national trend or effects of the region's industrial composition.

The traditional model is a comparative static model that considers only the starting and ending date of the analysis period, keeping the industrial composition of each region fixed in the interim. This can introduce bias in regions undergoing significant structural change, causing the industrial structure of the initial period to have an outsize influence. Because the traditional shift-share model also holds the employment share of regions relative to the national economy constant, it can introduce bias when regional employment patterns are changing over the period of analysis.

I implement a dynamic shift-share model, which is a standard way to correct for both of these potential biases by allowing growth rates and the industrial structure to change in every year between the start and end dates of the analysis. The shift-share effects for each time increment, typically a year, are then added to give the total shift-share over the entire period.

The dynamic shift-share decomposition of the change in employment e in industry i and region j from time t to $t+N$ is given by the formula:

$$e_{ij}^{t+N} - e_{ij}^{t} = \sum_{k=t+1}^{t+N} (NS)_{ij}^{k} + \sum_{k=t+1}^{t+N} (IM)_{ij}^{k} + \sum_{k=t+1}^{t+N} (RS)_{ij}^{k}$$

where:

- $(NS)_{ij}^{k}$ is the national share effect of the decomposition of the employment change from year $k-1$ to k, defined as:

$$(NS)_{ij}^{k} = e_{ij}^{k-1} \cdot g_{n}^{k}$$

- $(IM)_{ij}^{k}$ is the industry mix effect of the decomposition of the employment change from year $k-1$ to k, defined as:

$$(IM)_{ij}^{k} = e_{ij}^{k-1} \cdot (g_{in}^{k} - g_{n}^{k})$$

- $(RS)_{ij}^{k}$ is the regional shift effect of the decomposition of the employment change from year $k-1$ to k, defined as:

$$(RS)_{ij}^{k} = e_{ij}^{k-1} \cdot (g_{ij}^{k} - g_{in}^{k})$$

- g_{n}^{k} is the national growth rate of employment from $k-1$ to k
- g_{in}^{k} is the national growth rate of employment in industry i from $k-1$ to k
- g_{ij}^{k} is the growth rate of employment in industry i in region j from $k-1$ to k

The dynamic shift-share decomposition can be applied to the change in regional employment over the complete recession-recovery period in Britain and the United States. If we find that regional effects

played a larger role in Britain than in the United States over the recession-recovery period, this suggests that regional shifts in employment above and beyond the effects of industrial reallocation contributed to Britain's jobless recovery.

6.3 Job polarization

To evaluate whether job polarization drove the jobless recovery from the early 1980s recession in Britain, we first need to establish if Britain had more job polarization than the United States in this period. This paper identifies job polarization over the early 1980s in two ways: capturing changes in the task composition of the economy and measuring shifts in the employment share of occupational deciles.

The first method captures the changing occupational structure of the economy by tracing the prevalence of abstract, service, and routine tasks. This method is common in the United States job polarization literature, and a similar method has been applied to the post-1990 Labour Force Survey data for Britain in Dabla-Norris et al. (2019). To implement this first method of measuring job polarization, the occupational codes from 1975 are mapped into occupational codes from 2010. These 2010 occupational codes are then linked to O*NET SOC classifications which specify the amount of abstract, service, and routine tasks within each occupational category. As the composition of occupations changes in the economy, so does the prevalence of abstract, service, and routine tasks. Thus, for each year, changes in the average level of abstract, service, and routine tasks across the population indicate how occupational change has shifted the task composition of the economy.[18]

If job polarization is present, this first method should show a decline in the average amount of routine tasks and an increase in abstract and service tasks. This would imply that the employment share of occupations that rely heavily on routine tasks has declined, while the share of occupations that rely heavily on abstract or service tasks has increased.

A strength of the first method is that it captures the changing task composition of the economy. This aligns closely with the interpretation of job polarization as the decline of jobs with primarily routine tasks. Task-classified occupations thus offer a less noisy signal of job polarization than other methods that might capture routine jobs less directly. However, in the present historical application, this method has

[18]Frey and Osborne (2017) use a similar task-classification method to identify the jobs at risk for elimination by computerization. In a departure from the traditional job polarization literature, this includes some jobs that entail non-routine cognitive tasks. These jobs are at risk of computerization because of advances in AI and big data that allow for pattern recognition. The present paper focuses on traditional job polarization, the decline of routine jobs, because these developments in AI and big data had not yet occurred in the 1980s.

a major limitation because it depends critically on the classification of tasks in each occupation in 2010. While the O*NET task classifications are widely used in the literature, it is likely that occupations used different tasks in the late 1970s and early 1980s than they did in 2010. For example, in the 1980s the tasks of a travel agent might involve referencing paper fare sheets, calculating cost-effective travel routes, and issuing handwritten tickets. Travel agents today can largely automate the tasks of finding economical travel routes and arranging bookings, so they have instead specialized in other areas of travel management, relying on more abstract skills to operate travel management technology or to handle the bespoke travel needs of various businesses. This limitation is most significant when the tasks of an occupation changed considerably between the early 1980s and 2010. Job polarization that caused the decline in the prevalence of some occupations, such as bank tellers, would still be captured accurately by this method.

The second method ranks occupations based on their average hourly earnings and then tracks how the employment share of each decile changes over time. This is the method used in Goos and Manning (2007) and Cristini et al. (2018), among others, which also rely on the NES-ASHE data.

To implement this second method of quantifying job polarization, I rank all occupations by their average hourly earnings in a chosen year. Using this ranking, occupations are sorted into deciles, with lower-paid occupations in the lower deciles and higher-paid occupations in the higher deciles. This allows the middle-skill, middle-wage occupations to be identified. Then, keeping the ranking of occupations constant over time, the share of employment represented by each decile changes as the occupational structure shifts, capturing job polarization

If job polarization is present, this second method should show a decline in the share of employment in the middle deciles of the occupational ranking and an increase in the share of employment in the highest and lowest deciles. This U-shaped pattern indicates the "hollowing out" of the middle-skill routine occupations predicted by job polarization.

A strength of the second method is that it captures job polarization in an intuitive way by sorting occupations into high, middle, and low skill categories that can be tracked over time. This method also avoids the mapping issues that arise when occupational codes from 1975 are translated into more recent occupational classifications. However, a drawback of this method is that it makes the assumption that the distribution of wages corresponds closely with the definition of skill that relates to job polarization. While this assumption is common in the literature, wages are only an imperfect proxy for the skill level of an occupation.

While neither method of capturing job polarization is perfect, the combination of methods can reliably identify whether job polarization was more prevalent in Britain than in the United States. However, this does not imply that the jobless recovery in Britain was because of job polarization. It is also necessary to distinguish whether this job polarization was mainly "within industry" or "between industries." Within-industry job polarization refers to routine or middle-skill occupations disappearing within a certain industry as technological innovations or offshoring changes the task composition of that industry. For example, bank tellers were an important component of the banking and finance industry in the past, conducting routine financial transactions. As banking transactions became more automated and accessible online, there are fewer routine tasks in the banking industry, and the occupation of "bank teller" is less important to the industry. This within-industry component is what is typically thought of as occupational job polarization.

In contrast, between-industry job polarization picks up on the effects of structural change and industrial reallocation. For example, as the industry of Steel Works, Blast Furnaces, and Rolling and Finishing Mills declined, so did the employment share of all of the occupations associated with that industry, including rolling machine operators; furnace, kiln, and oven operators; and grinding, abrading, buffing, and polishing machine operators. These occupations were not displaced because of technological change or other improvements or routinization of the production process, but rather because of the decline of the Steel Works, Blast Furnaces, and Rolling and Finishing Mills industry in general. The driving force behind between-industry effects is actually the larger processes of industry labor reallocation and structural change, which is why it is important to establish how much job polarization is actually due to between-industry effects.

To break down the overall trend of job polarization into between-industry and within-industry components, I decompose the changes in the share of employment in each occupation decile identifed by the second method of capturing job polarization. The between-industry component is the change in the share of overall employment in an industry, weighted by the share of the industry that is in an occupation in the relevant decile. The within-industry component is the change of the share of an industry that is in an occupation in the relevant decile, weighted by the share of that industry in overall employment. These components are captured by the shift-share formula:

$$\Delta S_{d,t} = \sum_{i}^{I} \Delta s_{i,t} \omega_{d,i,t} + \sum_{i}^{I} \Delta \omega_{d,i,t} s_{i,t}$$

where the first term represents the between-industry component and the second term represents the within-industry component. More specifically,

- $\Delta S_{d,t}$ is the change in the employment share of the occupational decile d from t to $t+1$
- $\omega_{d,i,t}$ is the average share of industry i employed in the decile d at time t
- $s_{i,t}$ is the average employment share of industry i at time t.

If the job polarization we observe is actually owing to larger structural changes in the composition of industries in the economy, we should see larger "between-industry" effects than "within-industry" effects. Large "within-industry" effects, in contrast, would suggest occupational polarization was separate from labor reallocation across industries, and therefore job polarization may have contributed to Britain's jobless recovery from the early 1980s recession.

7 Results

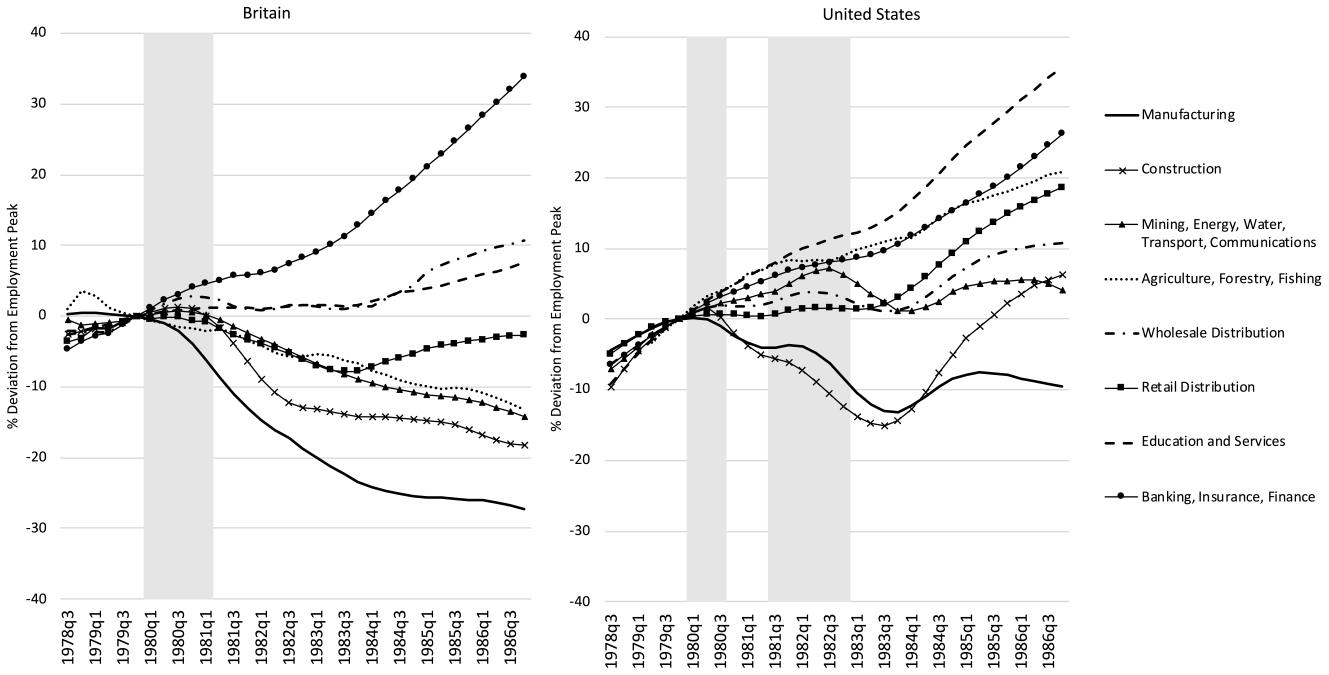
This section presents the results in turn for the three phases of analysis: (1) labor reallocation across industries, (2) regional employment shifts, and (3) job polarization. Britain is found to have had much more industrial reallocation in this period than the United States. Both Britain and the United States had shifts in their regional employment patterns, but in Britain these are found to be primarily because of the differing composition of industries in each region. More job polarization is observed in Britain than in the United States, but similarly this is owing primarily to industrial reallocation. These results thus indicate that labor reallocation across industries was the main driver of the jobless recovery in Britain.

7.1 Labor reallocation across industries

Were there differences in the scale of labor reallocation across industries in Britain and the United States during the early 1980s recession and recovery period? Figure 5 presents the results from the first test, giving the changing employment growth of industries in Britain and the United States in the early 1980s. The highlighted years indicate the recessionary periods for each country.

Figure 5 shows that after the recession, industries in Britain had extremely varied and persistent changes in employment. In contrast, industries in the United States fared more similarly, with employment declining in many industries during the recession but then rebounding shortly after. Looking at the patterns for specific industries, the contraction in manufacturing and in construction is more dramatic and persistent

Figure 5: Industrial change in Britain and the United States, 1978–1986



Analysis using British data from the 1987 and 1989 *Employment Gazette* Historical Supplements and US data from the QCEW. Industries were standardized between Britain and the United States. Public administration and defense excluded. Data for the United States is private sector only.

in Britain than in the United States, while both countries saw increases in employment in finance and in services.

Table 2 presents the second test for differences in the scale of industrial reallocation. This gives changes in industrial employment shares over the complete recession and recovery period for Britain and the United States, netting out any temporary cyclical effects. The time period analyzed for each country is the quarter just before the employment downturn through the quarter when national employment recovered to its pre-recession level. The second and third columns give the share of employment in each industry at the start and end of the cycle, and the final column gives the level difference in the share.

Table 2 shows that the industrial structure changed more significantly in Britain than in the United States over the recession-recovery cycle.[19] The decline in the employment share of manufacturing for Britain is particularly dramatic. As a share of private-sector employment, manufacturing fell from 34.6% of employment to 26.6% of employment at the end of the cycle. This decline of almost 8 percentage points is much more than the decline of less than 4 percentage points in the United States, bringing the share of manufacturing to a similar level in both countries.

[19]The results are qualitatively similar when an extended period of 1979Q4 to 1986Q4 is considered for the United States.

Table 2: Change in industry share of employment over 1980s recession-recovery

	Share of Emp. Pre-Recession	Share of Emp. Post-Recovery	Level Change in Emp. Share
United Kingdom (1979q4–1987q3)			
Agriculture, Forestry, Fishing	1.78%	1.64%	-0.14
Mining, Energy, Transport, Comm.	10.48%	9.36%	-1.12
Manufacturing	34.55%	26.61%	-7.94
Construction	5.77%	5.11%	-0.66
Wholesale Distribution	9.70%	11.29%	1.59
Retail Distribution	10.36%	10.88%	0.52
Banking, Insurance, and Finance	7.85%	11.61%	3.76
Education and Services	19.50%	23.49%	3.99
Unclassified	0.00%	0.00%	0.00
Total Establishment Employment	*20,641,750*	*19,093,000*	
United States (1979q4 - 1983q3)			
Agriculture, Forestry, Fishing	1.38%	1.53%	0.15
Mining, Energy, Transport, Comm.	7.55%	7.74%	0.19
Manufacturing	28.91%	25.18%	-3.73
Construction	6.18%	5.25%	-0.93
Wholesale Distribution	7.14%	7.23%	0.09
Retail Distribution	20.58%	21.04%	0.46
Banking, Insurance, and Finance	6.62%	7.28%	0.66
Education and Services	21.47%	24.49%	3.02
Unclassified	0.18%	0.26%	0.08
Total Establishment Employment	*72,696,704*	*72,582,184*	

Analysis using British data from the 1987 and 1989 *Employment Gazette* Historical Supplements and US data from the QCEW. Industries were standardized between Britain and the United States. Public administration and defense excluded. Data for the United States is private sector only.

The share of employment in education and services increased in both Britain and the United States to about 24% of all employment. However, banking and finance saw a much more dramatic increase over the recession-recovery period in Britain than in the United States. The employment share of banking and finance increased from 7.9% before the recession to 11.6% after the employment recovery — reaching a larger employment share than in the United States (7.3%).

Finally, there was a decrease in the share of employment in the mining, energy, water, transport, and communications sector in Britain but not in the United States. However, the share of employment in this large category remained higher in Britain than in the United States at the end of the cycle.[20]

Taken together, Figure 5 and Table 2 demonstrate that the early 1980s recession and recovery coincided with more significant structural change in Britain than in the United States. Declining industries in Britain did not recover as strongly after the recession as in the United States. This led the industrial composition of employment in Britain to change more dramatically over the recession and recovery period than in the United States. There was an especially large decline in the share of manufacturing and increase in the share of banking and finance in Britain relative to the United States. This evidence suggests that structural change may have been a key driver of the jobless recovery from the early 1980s recession in Britain.

7.2 Regional employment shifts

Could the jobless recovery from the early 1980s recession in Britain be because of the changing patterns of employment across regions? If regional employment changes were more significant in Britain than in the United States, this would suggest they may have driven the jobless recovery.

In terms of simple changes in the proportion of employment in each region, this does not seem to be the case. Both Britain and the United States experienced similarly large shifts in their composition of regional employment.[21] In Britain, there was exceptionally rapid growth in the share of employment in the South East region including London, while there was a consistent, dramatic decline in the share of employment in the North, North West, West Midlands, and Yorkshire regions. In the United States, there was a steep decline in the employment share of the East North Central region, while the South Atlantic region had consistent employment share growth.[22] Considering the full recession-recovery period with temporary

[20] It is also notable that these are high levels of structural change in absolute terms just for Britain. Summing the absolute value of the level changes in employment share for the six years and three quarters in Table 2 gives a 19.72 total percentage point change in the industrial composition. A similar calculation for the ten years 1987-1997 is only 11.74, and for 1997-2007 is 14.45.

[21] This analysis is provided in Appendix E Figure 18 and Table 9.

[22] The East North Central region includes Illinois, Indiana, Michigan, Ohio, and Wisconsin. The South Atlantic region

cyclical effects netted out, the dominant regional trend in Britain was the growth of employment in London and the South East, providing employment opportunities for workers when other regions were struggling. In contrast, the key story in the United States was the deterioration of employment opportunities in the East North Central region, possibly dispersing workers to other regions of the country. Thus, there do not appear to be major differences in the scale of regional employment change in Britain and the United States.

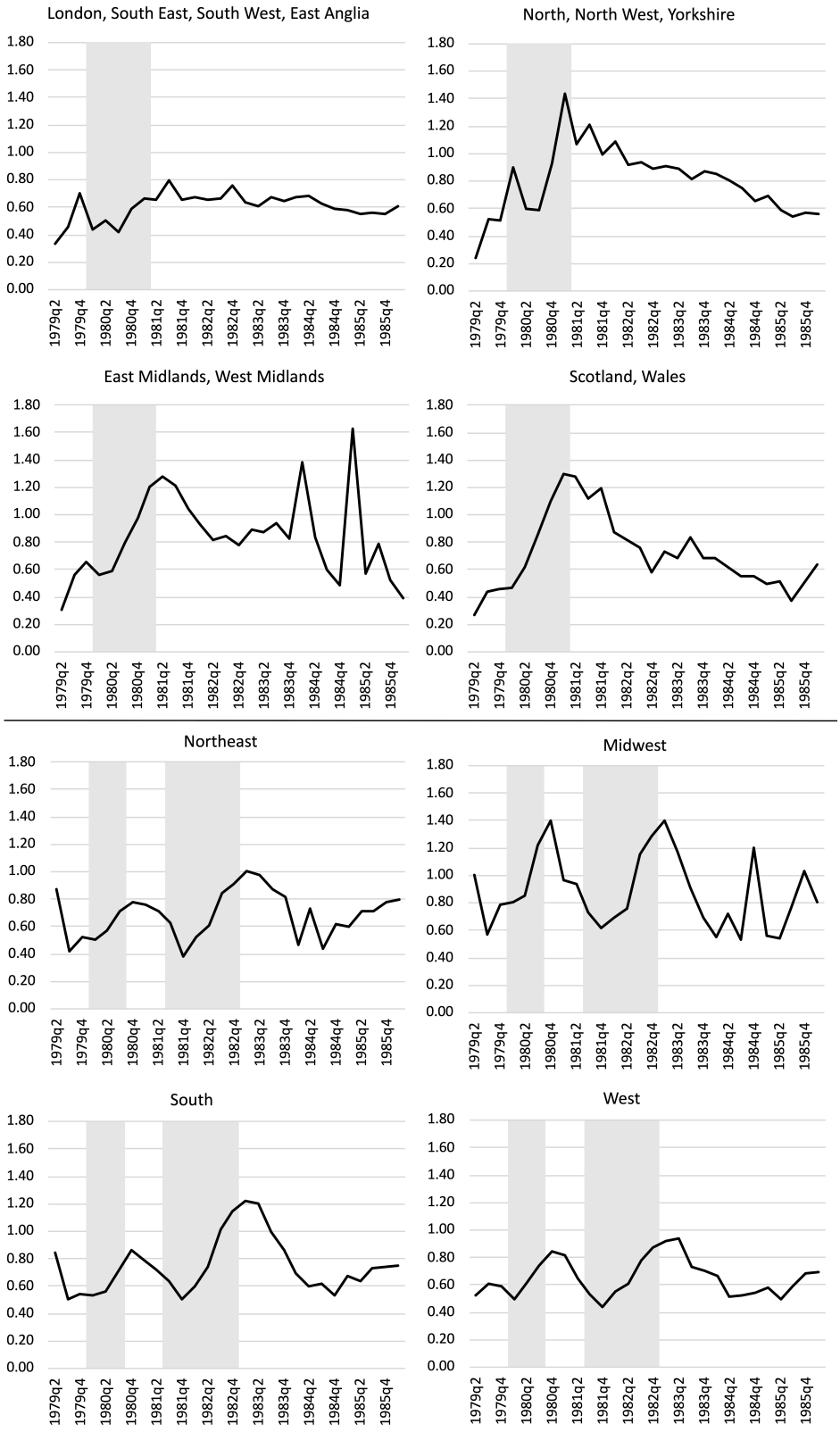
To what extent were these shifts in regional employment just owing to differences in regions' industrial composition? To explore this, I first compute a simple index of industrial reallocation for each region which captures the dispersion of employment growth across industries within the region. The measure of variance used is the mean absolute deviation. Figure 6 aggregates these quarterly industrial reallocation estimates into four areas of Britain and the four Census regions of the United States, which are given in the first and second panels respectively.

In both the graphs for Britain in the first panel of Figure 6 and the graphs for the United States in the second panel, it is evident that industrial reallocation varied considerably in levels and trends by region within each country. During the recession in Britain, industrial reallocation was highest in the North, Wales, and Scotland, which were the regions that were also losing relative employment share. The United States had a similar pattern, with industrial reallocation highest during the recession in the Midwest region which was losing relative employment share. Industrial reallocation varied across regions from about 0.30 to 1.60 in Britain, and from about 0.40 to 1.40 in the United States. This means that, on average, industries' quarter-on-quarter employment growth differed from the regional mean by about 0.30 to 1.60 percentage points, with substantial variation over time and between regions.

The level of labor reallocation across industries thus varied by region in both Britain and the United States. This motivates our key test for regional differences between Britain and the United States, a dynamic shift-share analysis that decomposes regional employment changes over the recession-recovery period into industry mix, national, and regional effects. This decomposition will allow us to see whether regional effects above and beyond the composition of industries in a region drove the changing patterns of employment in both countries.

includes Maryland, DC, Virginia, Florida, Georgia, North Carolina, South Carolina, West Virginia, and Delaware.

Figure 6: Industrial reallocation in aggregated regions of Britain and the United States



Analysis using British data from the 1987 and 1989 *Employment Gazette* Historical Supplements and US data from the QCEW. Industrial reallocation captured by the mean absolute deviation on the vertical axis.

The results of the dynamic shift-share analysis are shown in Figure 7, which suggests that regional effects were less important in Britain than in the United States during the early 1980s recession and recovery. The decompositions for Britain indicate larger industrial mix effects and national effects, while the decompositions for the United States indicate larger regional effects. These trends are especially apparent when comparing the regions with the most change over the period. In Britain, the South East (including London) attracted new employment over the period. Most of this additional employment was because of the industry mix effect rather than a pure regional effect.[23] In contrast, the region of the United States with the worst employment growth, the East North Central division, was dominated by a regional effect above and beyond industry mix effects. These results suggest that the regional shifts in employment observed in Britain during the early 1980s recession and recovery were in large part because of the differing experiences of industries in this period, unlike in the United States.

To summarize, in some ways the regional employment effects of the early 1980s recession in Britain and the United States were quite similar. The distribution of employment across regions in both countries changed significantly, with poor-performing regions in Britain losing employment share to growth in the South East, and the Midwestern United States losing employment share to regions like the South Atlantic and the West. Additionally, both countries had more significant industry labor reallocation in some regions than in others during the recession. However, when these regional shifts are decomposed into the part owing to a region's industrial mix and the part above and beyond industrial mix, it is clear that industrial mix effects played a larger role in regional employment changes in Britain than in the United States. The regional changes in employment observed in this period in Britain were driven by the divergent performance of industries that were concentrated in some declining regions. Therefore, there is not evidence that pure regional effects caused the jobless recovery in Britain. In fact, the evidence in this section further indicates that labor reallocation across industries, driving the industrial mix effects, was the key difference between Britain and the United States in the early 1980s recession and recovery period.

[23]For a longer-run decomposition of regional employment shifts in Britain, see Gardiner et al. (2013).

Figure 7: Dynamic shift-share analysis of regional employment change over the early 1980s recession-recovery, Britain and the United States

Analysis using British data from the 1987 and 1989 *Employment Gazette* Historical Supplements and US data from the QCEW

7.3 Job polarization

Was there more job polarization in Britain than in the United States in this period, and, if so, did it cause the jobless recovery? We consider the two measures set out in Section 6.3.

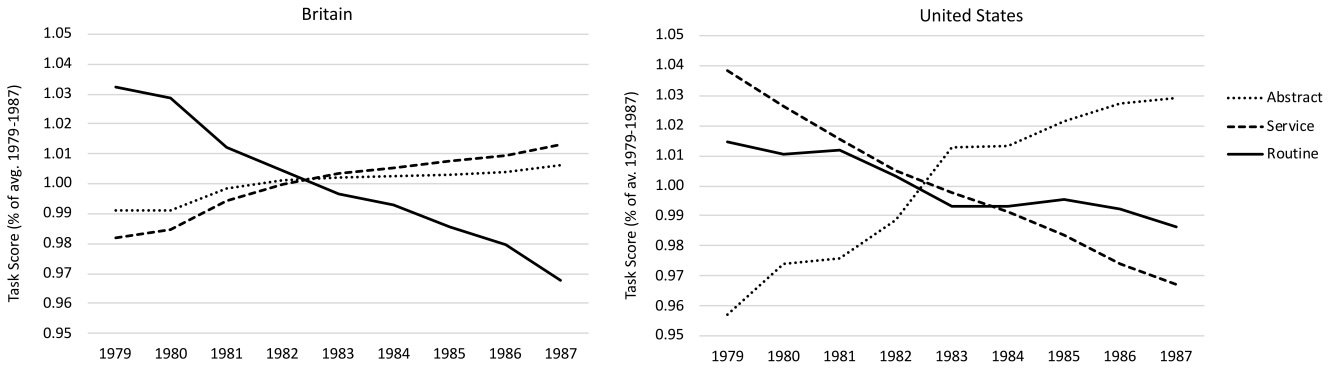
Our first measure of job polarization is the changing amount of abstract, service, and routine tasks in the economy based on workers' occupations in the ASHE dataset. The left panel of Figure 8 shows this changing task composition in Britain from 1979 to 1987. The declining solid line shows that occupations with routine tasks became less prevalent over the period, while, in contrast, occupations with abstract and service-based tasks became increasingly important.[24]

In contrast, the right panel of Figure 8 shows that the United States did not have the same pattern of polarization over this period. This is consistent with the results of Autor et al. (2003), and others, that the United States did not experience significant job polarization from 1979 to 1987.[25] Both Britain and the United States had a decrease in the proportion of occupations with routine tasks and an increase in the proportion with abstract tasks. However, the proportion of occupations with service tasks fell in the

[24] Appendix F shows that the trends in abstract, routine, and service tasks in occupations were extremely similar across the regions of England, Scotland, and Wales and between genders. The overall trends were also similar between full-time and part-time workers, though the decline of routine tasks in the part-time economy was not as steep as in the full-time economy.

[25] For example, Autor et al. (2003, Figure 1) show on a decadal level that the sharpest decline in the share of routine tasks occurs after 1990, later than in the British case, and that the share of services declines over the 1980s.

Figure 8: Change in task composition
in Britain and the United States, 1979–1987



Source for Britain: ONS confidential ASHE data. US analysis using the CPS May Supplement data.

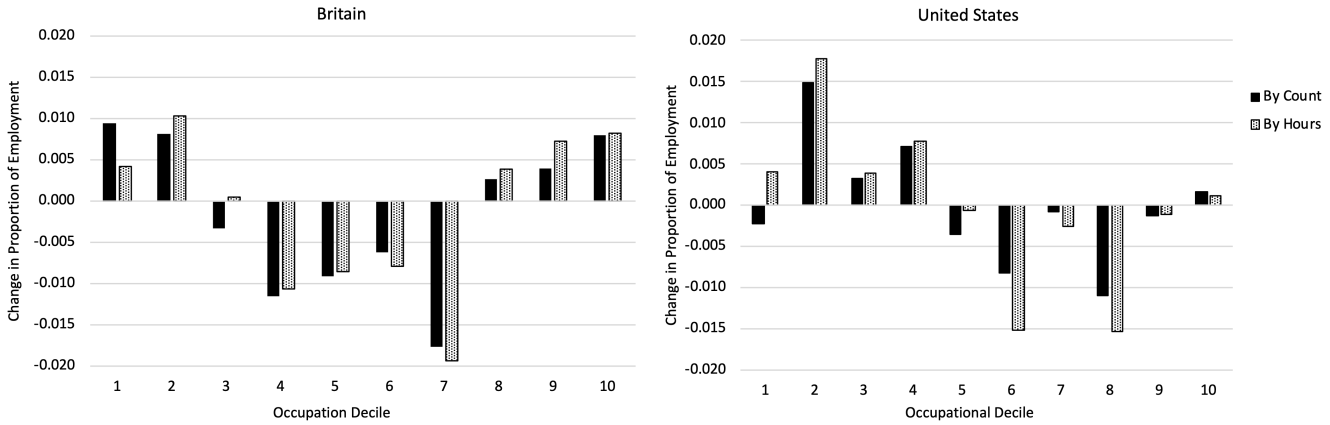
United States, disrupting the traditional polarization pattern. In contrast, the share of jobs with service tasks increased in Britain over this period. The task-based measure of job polarization thus confirms that job polarization was more significant in Britain than it was in the United States over the early 1980s recession and recovery period.

Our second test is the occupational-decile based measure of job polarization. If job polarization is occurring, we should see a U-shaped pattern across the deciles, with a decline in the employment share of middle-skill occupations and an increase in the employment share of the lowest and highest skill occupations. Figure 9 shows how the employment share of each occupational decile changed from 1979 to 1987. The occupational deciles were determined based on average hourly earnings in 1979, with the occupations with the lowest average hourly earnings in decile 1 and the occupations with the highest average hourly earnings in decile 10. The bars give the change in the proportion of total employment classified into that occupational decile. The black bars show the raw change in the share of employment based on the number of workers in each occupational decile. The white patterned bars show the change in the share of employment based on hours worked, capturing changes on both the extensive and intensive margins.

In the left panel of Figure 9, the U-shaped change in employment share by occupation deciles indicates that job polarization was occurring in Britain from 1979 to 1987.[26] The employment share of the lowest two deciles and the highest three deciles increased over the period, while the employment share of the middle five deciles decreased. This indicates that the occupational composition of the economy was shifting away from middle-skill occupations towards the upper and lower ends of the distribution. In total, the decline

[26] Appendix F Figure 22 shows that these results are robust to using occupational rankings based on data from 1975, 1983, and 1987.

Figure 9: Change in the proportion of employment in the United States and Britain by occupation decile, 1979–1987



Source for Britain: ONS confidential ASHE data. US Analysis using the CPS May Supplement data. Occupational decile calculated for 1979.

in the share of middle-skill occupations was about 4.8 percentage points, while the increase in the lower and upper deciles was about 3.2 percentage points. This polarization process therefore impacted over 1.5 million workers.

The right panel of Figure 9 shows that, in contrast, job polarization was not occurring over this period in the United States. The change in employment shares fails to show the distinctive U-shaped pattern of job polarization.[27] In the United States, there was a large increase in the share of employment in the second decile, as well as in the third and fourth deciles. The share of employment declined in the sixth and eighth deciles, but there was no increase in employment for the top end of the distribution. This confirms that the job polarization experienced in Britain was distinct from the experience of the United States in this period.

Both methods of identifying job polarization therefore indicate that job polarization was occurring in Britain during the early 1980s. However, it is still necessary to distinguish whether this job polarization was mainly "within industry" or "between industries." Within-industry job polarization is what is typically meant by job polarization—occupations that rely on routine tasks become less prevalent, changing the occupational composition within an industry. In contrast, between-industry polarization just reflects the changing composition of industries in the economy, capturing industrial reallocation instead of job polarization. To identify whether the observed job polarization is between or within occupations, I decompose changes in the share of employment of each decile into between- and within-industry components.

[27] Appendix F Figure 23 shows the change in the share of employment from 1979 to 1984, the end of the recession-recovery period in the United States. The pattern is even less prevalent.

Table 3: Decomposition of decile employment share change in Britain, 1979–1987

Decile	Emp. Share in 1979	Emp. Share in 1987	Percentage Point Change	Within Industries	Between Industries
1	15.84%	17.01%	1.17	-0.02	1.17
2	14.82%	16.07%	1.25	0.79	0.44
3	16.48%	16.37%	-0.12	0.12	-0.20
4	9.23%	8.19%	-1.04	-0.71	-0.33
5	7.71%	6.89%	-0.82	-0.08	-0.71
6	6.50%	5.95%	-0.54	-0.09	-0.44
7	5.83%	4.11%	-1.71	-0.97	-0.74
8	6.45%	6.80%	0.36	0.26	0.09
9	6.00%	6.49%	0.49	0.88	-0.40
10	11.14%	12.10%	0.96	-0.18	1.11

Source: ONS confidential ASHE data. Employment share by count. The final two columns may not add up to the total percentage point change because of rounding.

Table 3 gives the results of this decomposition for all ten occupational deciles in Britain over the 1979 to 1987 period. Occupations are ranked by average hourly earnings with 1979 as the base year. The employment share of each decile is given for 1979 and 1987, where the employment share is calculated by the proportion of workers.[28] The last two columns show how the percentage point change is decomposed into within-industry and between-industry components.

While there is some variation across the deciles, in some of the key deciles it is clear that a between-industry effect makes up most of the polarization result. In the first decile, the entire 1.17 percentage point increase in employment share is attributable to the between-industry component. Similarly, the between-industry component accounts for the increased employment share of the tenth decile. In the fifth decile, which shows a significant decrease in employment share, over 85% of the effect is because of shifts between industries. Without the between-industry component, there would be little or no employment change in these deciles and thus no U-shaped pattern of polarization across all deciles.

The importance of the between-industry effect indicates that the driving force behind the job polarization results for Britain in this period was actually the shifting industrial composition of the economy. While there is evidence of job polarization measured in terms of abstract, service, and routine tasks and by occupational deciles, much of this polarization is an empirical artifact of the changing industrial structure of Britain, so it could not have been the cause of the jobless recovery. These results instead offer additional evidence that industrial reallocation was the central driver of the early 1980s jobless recovery in Britain.

[28] The results are similar when employment share by hours is used.

8 Conclusion

This paper tested two hypotheses: first, was the recovery in Britain from the early 1980s recession an example of a jobless recovery? Second, was this jobless recovery driven by industrial reallocation, regional employment shifts, or job polarization?

The first hypothesis was tested by comparing the length of the recovery from the early 1980s recession in Britain to other recessions in Britain and the United States. The early 1980s recession in Britain meets the standard for a jobless recovery. A detailed analysis of Okun's law for Britain suggests that this jobless recovery was not because of slow output growth but rather represented a temporary change in the relationship between output and employment. The jobless recovery remains when issues of recession dating and compositional effects across regions are taken into account.

This first result is important because it provides a clear example of a jobless recovery before 1990. Many researchers have sought to explain the post-1990 jobless recoveries in the United States with other phenomena that emerged post-1990. This early example of a jobless recovery raises questions about these explanations and motivates a focus in the rest of the paper on other potential causes of jobless recoveries: industrial reallocation, regional change, and job polarization.

Then, this paper explored these possible explanations for the jobless recovery. The United States is taken as a comparison case because they did not have a jobless recovery from the early 1980s recession but were similar in many ways, including struggling with inflation, experimenting with monetarism, and increasing their domestic oil production. For each possible cause of the jobless recovery, the experience of Britain was compared to that of the United States to identify the differences that may have led to the jobless recovery.

The results indicate that the leading candidate explanation for the jobless recovery in Britain is labor reallocation across industries. Britain faced rapid, permanent industry labor reallocation at a level unseen in the United States. The decline in the employment share of manufacturing and the increase in the employment share of banking and finance in Britain were especially large relative to the United States.

While both Britain and the United States saw significant changes in their regional distribution of employment during the early 1980s period, in Britain these changes were in large part because of the differing experiences of industries. A dynamic shift-share analysis indicates that industrial mix effects were more significant in Britain than in the United States. The regional changes in employment that emerged

in Britain thus reinforce industrial reallocation as the central difference between Britain and the United States.

Lastly, Britain is found to have experienced more job polarization over the early 1980s recession and recovery period than the United States. However, a large portion of this polarization was between industries rather than within industries. This is additional evidence that labor reallocation across industries was the key factor behind the early 1980s jobless recovery in Britain.

This set of results on the explanations for the early 1980s jobless recovery in Britain bolsters the evidence that jobless recoveries may be because of structural change through the reallocation of labor across industries. By pushing back the date at which jobless recoveries began and analyzing this clear example of a jobless recovery owing to slow employment growth, the evidence in this paper in support of the role of industrial reallocation is valuable to broader debates in the literature on the causes of jobless recoveries.

These results also contribute to our understanding of the early 1980s recession and mass unemployment in Britain, one of the most severe economic crises in British history. The role of structural change in this unemployment episode casts new light on, and raises new questions about, fiscal and monetary policymaking under the Thatcher government. High interest rates brought about by monetarism likely contributed to structural change by disadvantaging export industries. Thatcher's fiscal conservatism, privatization of industry, and weakening of trade unions may also have contributed directly to structural change or indirectly failed to mitigate its aggregate employment impacts. The evidence in this paper indicates that the scale of structural change in Britain was much larger than in the United States over the same period, suggesting that these policies transformed the British economy in a way that was not paralleled in the United States despite their similar policy outlook. These structural changes contributed to Britain's jobless recovery from the early 1980s recession, with real employment costs.

This perspective on the early 1980s recession additionally shapes our understanding of the interaction of cyclical downturns and structural change more broadly, which is an area of continued interest (Sahin et al. 2014; Chodorow-Reich and Wieland 2020, for example). It also speaks to recent research on interwar Britain, which finds a key role for industrial reallocation and regional effects in the unemployment downturn of the 1920s and early 1930s (Paker 2021; Luzardo-Luna 2022; Booth and Glynn 1975). In the early 1980s case, this paper finds that structural change meaningfully impacted the early 1980s recession, contributing to a jobless recovery that lengthened the unemployment crisis of the 1980s. This suggests continued study

of the interaction of cyclical and structural forces in historical recessions. It also directs future research on Britain in the 1980s to further consideration of the drivers of rapid structural change in this period and its consequences for different segments of the labor force.

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Appendices

A Economic performance of Britain and the United States, 1979–1987

Figure 10 gives three key economic indicators for Britain during the five-quarter recession from 1980 to 1981 and after. The left panel shows the negative real GDP growth over the recession dates but then a good recovery afterward. The center panel tracks CPI over the same period. There was a dramatic increase in inflation in 1979, but the growth rate of the price level slowed during the recession dates and stabilized afterward. Finally, the right panel shows that productivity growth in terms of output per worker trended upward during the recession recovery beginning in 1981.

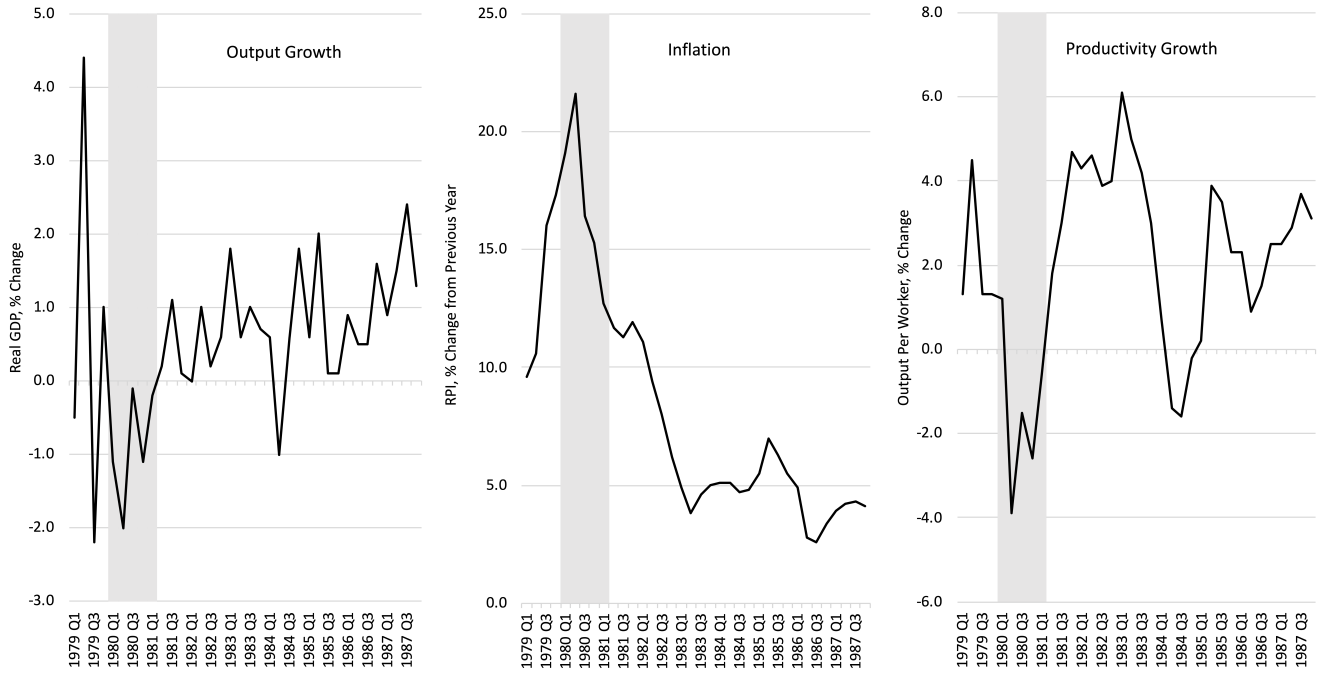
Britain's employment recovery appears slow when compared to other countries. Table 4 gives the growth in employment after the end of the early 1980s recession for the twenty-one OECD countries that had an early 1980s recession. The table is standardized to the different recession end dates for each country and gives the cumulative employment growth one and two years after the trough. While a handful of countries had meager employment growth during this period, two years after the end of the recession Britain had the fourth worst employment performance of the twenty-one countries listed. Only Ireland, Spain, and Belgium had slower employment growth two years after the trough, and none of these countries had real GDP growth that was as strong as in Britain. Many countries had much better employment growth two years after the end of the recession, including the US, Canada, Australia, Switzerland, and Denmark.

Figure 11 shows net exports of crude oil in Britain from 1975 to 1990. Net exports became less negative in the late 1970s, with exports first outpacing imports in 1980.

Table 5 gives the headline statistics for the early 1980s recession in Britain and the United States. The recessions are broadly comparable.

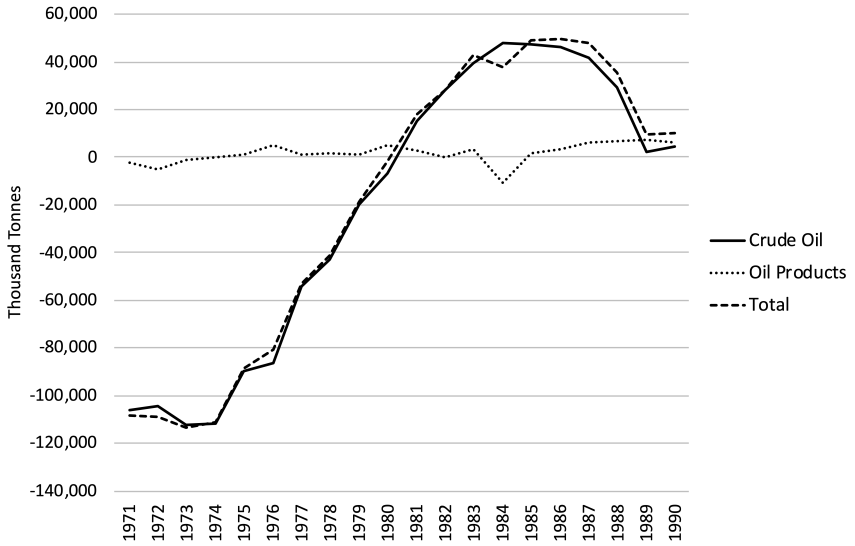
Figure 12 shows that net exports of crude oil from the United States became less negative through the late 1970s and early 1980s, even though the United States did not export more than they imported during this period like Britain did.

Figure 10: Economic performance in Britain, 1979–1987



Quarter-on-quarter GDP growth from ONS series [IHYQ], RPI percent change from ONS series [CZBH], and output per worker from ONS series [A4YN].

Figure 11: Net exports of crude oil and oil products from Britain, 1975–1990



Source: UK Department for Business, Energy, and Industrial Strategy, "Crude oil and petroleum products: production, imports, and exports 1890 to 2018."

Table 4: Growth in employment after early 1980s recession, international comparison

		Years Since Trough	
	Trough Year	One	Two
Ireland	1983	-1.80	-4.26
Spain	1981	-1.30	-2.39
Belgium	1981	-1.30	-2.29
United Kingdom	1981	-1.90	-2.10
Netherlands	1982	-1.90	-2.00
Norway*	1982	-1.90	-2.00
Austria	1981	-0.90	-1.89
Germany	1982	-1.20	-1.79
France*	1983	-1.00	-1.30
Luxembourg	1981	-0.30	-0.60
Portugal	1984	-0.50	-0.30
Sweden*	1981	-0.10	0.00
Italy*	1982	0.30	0.60
Denmark	1981	0.40	0.70
Switzerland	1982	0.00	1.00
Australia	1982	-1.80	1.15
Greece*	1983	0.30	1.30
Canada	1982	0.50	2.91
Turkey	1980	2.10	3.53
Iceland	1983	1.50	5.15
United States	1982	1.30	5.45

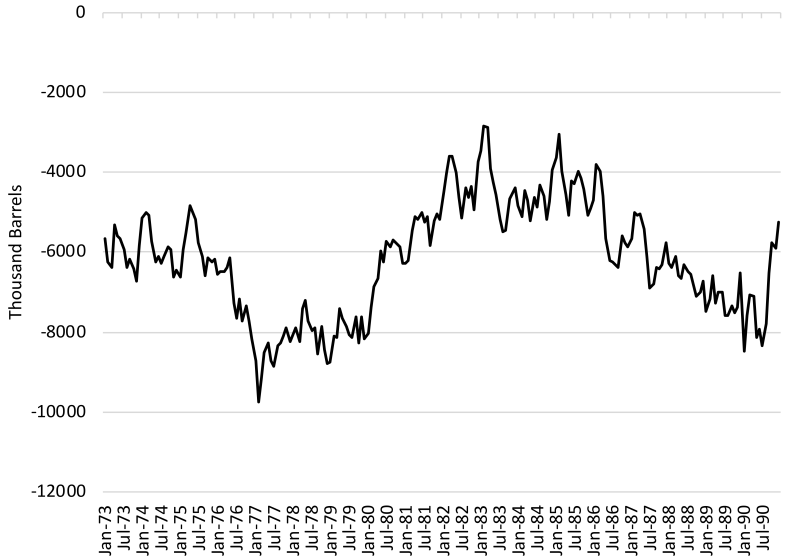
Analysis using data from *OECD Economic Outlook*, Volume 1990 Issue 2, Tables R 1 and Table R 17. Entries are the cumulative percent changes in employment from the trough. Business cycle trough dates are taken as the last year in which real GNP/GDP growth was negative for the country, except for the cases with an (*). In these cases, real GNP/GDP growth was never negative, so the trough date is the last year in which it was less than 1%. Finland, Japan, and New Zealand are omitted because they did not have negative or less than 1% real GNP/GDP growth.

Table 5: The early 1980s recession in Britain and the United States

	Length (mo.)	Length (qtr.)	Unemp. Rate Peak - During Recession	Unemp. Rate Peak - Overall	GDP Decline (PtT %)
Britain					
Jan 1980-Mar 1981	15	5	9.1% (Mar 1981)	11.9% (Mar-May 1984)	-4.48
United States					
Jan 1980-Jul 1980	6	2	7.8% (July 1980)	7.8% (July 1980)	-2.18
July 1981-Nov 1982	16	5	10.8% (Nov 1982)	10.8% (Nov 1982)	-2.52

UK GDP from ONS series [ABMI] and unemployment rate from ONS series [MGSX]. US GDP from BEA series [GDPC1] and unemployment rate from BLS series [UNRATE]. Unemployment rate peak during the recession is the highest unemployment rate within the recession dates. Unemployment rate peak overall is the highest unemployment rate during the recession-recovery cycle, including after the trough. GDP decline is from the peak to the trough (PtT) of the recession.

Figure 12: Net exports of crude oil from the United States, 1973–1990



Source: US Energy Information Administration, "U.S. Net Imports of Crude Oil and Petroleum Products"

B Non-disclosed employment figures in the QCEW

The US Bureau of Labor statistics suppresses the publication of data that could possibly identify individual employers in the QCEW. Disclosure restrictions only become an issue when industry-level analysis is conducted at the sub-national level, as the US totals include all observations. Disclosure restrictions therefore do not affect aggregate industrial analyses such as in Figure 5 or Table 2.

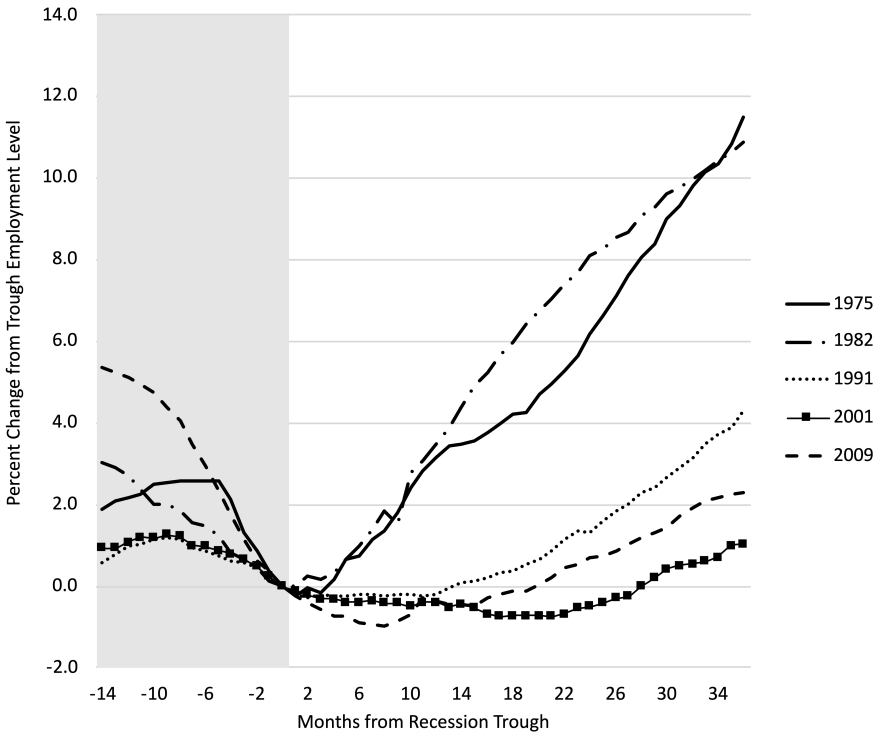
On the state level, 14.55% of observations of quarterly employment from 1975 to 1986 are not disclosed at refined industry categories. The majority of these cases are for industry categories located in local, state, and national government sectors. Few of the non-disclosed observations are for the private sector, so disclosure issues are minimized by restricting to the private sector. Restricting to the private sector leaves only 4.1% of all observations non-disclosed.

All of these suppressed observations fall into three broad industry categorizations: agriculture, mining, and non-classifiable industries. Fortunately, in agriculture and mining, undisclosed quarterly employment observations are more likely to be one-off occurrences rather than missing for long periods of time. This makes it possible to simply interpolate from the surrounding rows an estimate of quarterly unemployment in the quarters in which such data is unavailable. After this interpolation, only 2.1% of observations are non-disclosed. By omitting non-classifiable industries, where non-disclosed employment figures are pervasive, disclosure restrictions impact only 1.5% of observations, which are dropped.

C Jobless recoveries in the United States

Figure 13 summarizes the experience of the United States in the five recessions from 1971 to 2019. The recessions ending in 1975 and in 1982 saw strong employment recoveries from about two months after the trough. In stark contrast, the recessions ending in 1991, 2001, and 2009 all had a significantly delayed employment recovery after the end of the recession.

Figure 13: Employment growth after recent recessions in the United States



Analysis using BLS total nonfarm payroll series [PAYEMS].

D Okun's law

Was there a change in Okun's law in Britain during the early 1980s recession recovery? As described in the main text, this is important to determine because a recovery can appear jobless in two ways. First, there could be a shift in the relationship between output growth and unemployment (a change in Okun's law), such as normal output growth and abnormally slow employment growth. This is what is typically assumed to occur in a jobless recovery. Second, there could be no change in the relationship between output growth

and unemployment, but employment could recover slowly after a recession simply because output growth is also slow. It is therefore essential to determine whether the relationship between unemployment and output growth was unusual in the early 1980s relative to other times, or if the slow employment recovery was because of slow GDP growth.

Galí et al. (2012) argue that slow GDP growth can explain the three United States jobless recoveries, suggesting they should instead be called "slow recoveries." Ball et al. (2017) comprehensively evaluate Okun's law for the United States from 1948 to 2013. They find that Okun's law was stable during this period, indicating again that there were no true jobless recoveries with an abnormal relationship between output growth and unemployment in the United States. Though this continues to be debated (see Gordon 2010; Elroukh et al. 2020), I replicate the analysis in Ball et al. (2017) for Britain in order to use the most stringent tests for whether there was a shift in Okun's law during the early 1980s recession recovery.

Ball et al. (2017) estimate Okun's law using two methods. Their preferred "levels" method involves estimating the natural unemployment rate U_t^* and potential log output Y_t^* using a Hodrick-Prescott (HP) filter, and then measuring the relationship between the output and unemployment gaps. This is the equation

$$U_t - U_t^* = \beta(Y_t - Y_t^*) + \epsilon_t$$

where U_t is the actual unemployment rate and Y_t is the actual log output. β is the Okun's law coefficient, and the key question is whether this is stable over time or if it changes during a potential jobless recovery. If this is stable, the slow employment recovery does not represent a shift in Okun's law so is just an artifact of the slow output recovery. If this shifts, then there is a change in the relationship between output and the unemployment rate, as is often assumed in the jobless recovery literature.

As a robustness check, they also estimate the "changes" version, which relates raw changes in the unemployment rate to raw changes in log output. This version requires the assumption there are no changes in the natural unemployment rate or potential output in a period, which is likely not met and therefore can bias these estimates. However, this version does not depend on estimation of the natural unemployment rate or potential output. The changes equation is

$$\Delta U_t = \alpha + \beta \Delta Y_t + \omega_t.$$

For the United States, Ball et al. (2017) estimate the Okun's coefficient on an annual and quarterly

level at various smoothing parameters for the HP filter. For the quarterly estimates, they also include two lags of log output. They check for stability over time by (1) plotting the residuals from the estimation to show if the estimated coefficient fits the true patterns well in each time period, (2) testing for structural breaks, and (3) computing Okun's coefficients for different time periods.

I replicate this analysis for Britain using ONS data from 1971 to 2018. Table 6 gives the Okun's coefficient estimates for Britain using annual data, and Table 7 gives the Okun's coefficient estimates using quarterly data (including the two lags), replicating Tables 4 and 5 in Ball et al. (2017). Focusing on the estimates in columns (2) and (3) of each table, which are the levels estimates, the estimated Okun's coefficient is about -0.35 to -0.40.

Table 6: Okun's law estimates for Britain (annual data: 1971–2018)

	(1) Differences	(2) Levels	(3) Levels
HP filter λ		$\lambda = 100$	$\lambda = 1000$
ΔY_t	-0.2827***		
	(0.0647)		
$(Y_t - Y_t^*)$		-0.3824***	-0.4020***
		(0.0562)	(0.0642)
Constant	0.0057**	0.0000	0.0000
	(0.0019)	(0.0014)	(0.0025)
N	47	48	48
Adjusted R^2	0.433	0.619	0.541
RMSE	0.007	0.007	0.010
Durbin-Watson	0.979	0.753	0.404
Struc. break 1981	Yes***	Yes*	Yes***

Newey-West standard errors in parentheses. * p <0.05, ** p <0.01, *** p <0.001. Column (1) is the Okun's law estimates in differences: $\Delta U_t = \alpha + \beta \Delta Y_t + \epsilon_t$. Columns (2) and (3) are the Okun's law estimates in levels: $U_t - U_t^* = \beta(Y_t - Y_t^*) + \epsilon_t$. The last row gives the results of a Wald test with known break date at 1981.

The first test of stability over time is to observe whether this Okun's coefficient for 1971-2018 holds during the early 1980s period. To do this, following Ball et al. (2017, fig. 2), I plot the fitted unemployment gap and the actual unemployment gap for the full period, based on the Okun's law specifications. Figure 3 in the main text shows that there were large residuals during the early 1980s period, with the actual unemployment rate about two percentage points higher than the predicted unemployment rate given changes in GDP.

This result is robust to changing the HP filter. Figure 14 shows the fitted unemployment rate gap for

Table 7: Okun's law estimates for Britain
(quarterly data: 1971–2018)

	(1) Differences	(2) Levels	(3) Levels
HP filter λ		$\lambda = 1600$	$\lambda = 16000$
$(L)\Delta Y_t$	-0.2851***		
	(0.0466)		
$(L)(Y_t - Y_t^*)$		-0.3428***	-0.4110***
		(0.0457)	(0.0411)
Constant	0.0014***	0.0000	-0.0000
	(0.0004)	(0.0005)	(0.0008)
N	189	190	190
Adjusted R2	0.436	0.683	0.725
Root MSE	0.002	0.003	0.005
Durbin-Watson	0.891	0.293	0.167
Struc. break 1981	Yes***	Yes***	Yes***

Newey-West standard errors in parentheses. * p <0.05, ** p <0.01, *** p <0.001. (L) indicates the table entry is the sum of the coefficients on the variable, a first lag, and a second lag. Columns (1) is the Okun's law estimates in differences: $\Delta U_t = \alpha + \beta_1 \Delta Y_t + \beta_2 \Delta Y_{t-1} + \beta_3 \Delta Y_{t-2} + \epsilon_t$. Columns (2) and (3) are the Okun's law estimates in levels: $U_t - U_t^* = \beta_1(Y_t - Y_t^*) + \beta_2(Y_{t-1} - Y_{t-1}^*) + \beta_3(Y_{t-2} - Y_{t-2}^*) + \epsilon_t$. The last row gives the results of a Wald test with known break date at 1981.

the annual model with HP smoothing of 100 from Table 6 Column (2). This shows large differences from the actual unemployment rate gap in the 1980s.

The result is also robust to quarterly data. Figure 15 shows the fitted values for the quarterly model with HP smoothing of 16000 from Table 7 Column (3). This also shows large differences in the 1980s.

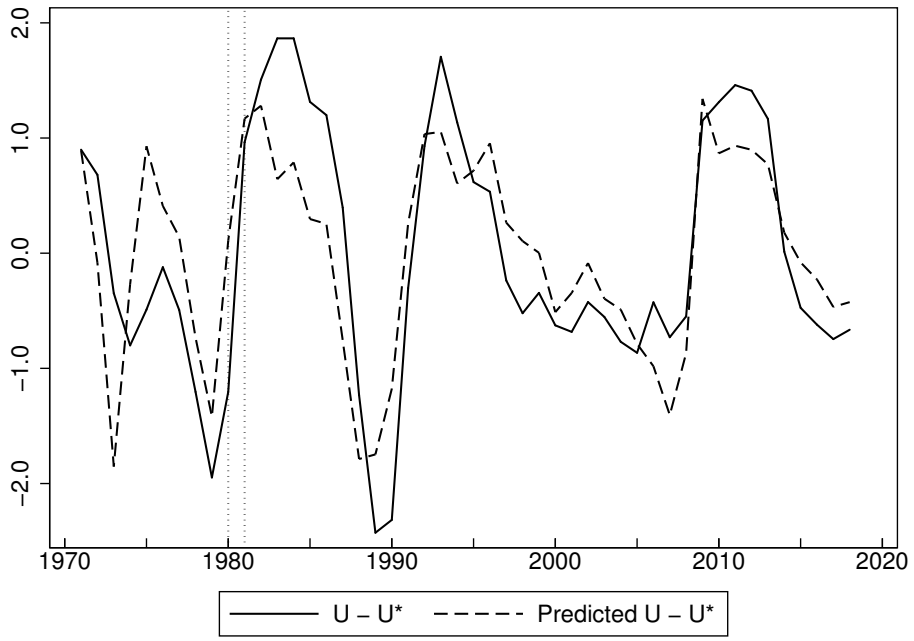
The result is also robust to using the differences method of Okun's law rather than the levels method. Figure 16 shows the fitted values for the quarterly model in differences from Table 7 Column (1). This also shows large differences from the actual unemployment rate changes in the 1980s.

In all of these cases, the actual unemployment rate or unemployment rate gap was greater then expected based on changes in output or the output gap.

The second test is a test for structural breaks in the Okun's law relationship following Ball et al. (2017, sec. 2.3). The last row of Tables 6 and 7 indicate the results of a test for a known break date in the relationship at 1981 or the first quarter of 1981. In all cases, a structural break was detected at this date, indicating a shift in the relationship between output and employment in 1981.

The third test is estimating separate Okun's coefficients for the early 1980s period to see if there were large differences, following Ball et al. (2017, tab. 3). Table 8 gives the results for annual data. In general,

Figure 14: Actual and fitted unemployment rate gap, 1971–2018, annual data, levels method $\lambda = 100$



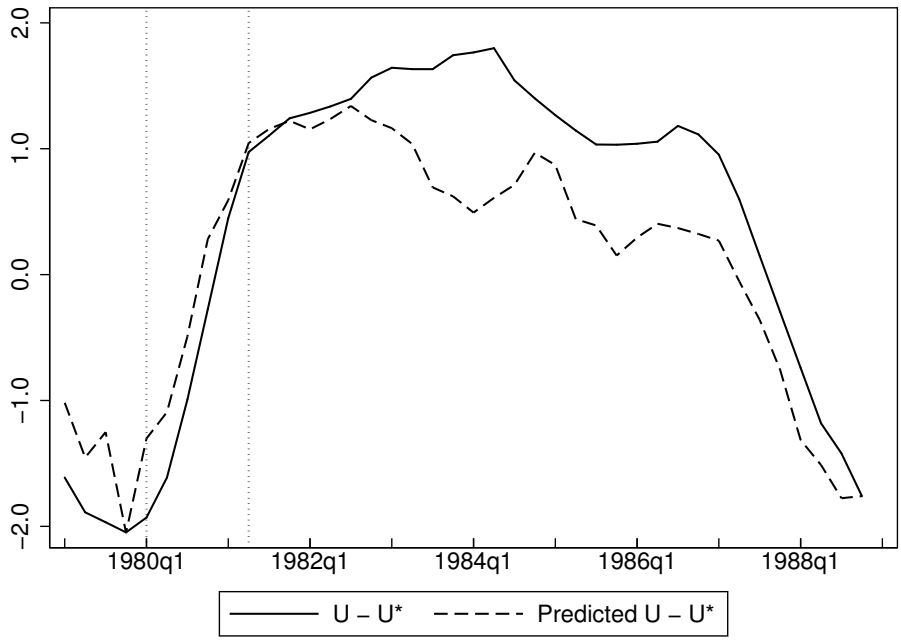
Analysis using ONS unemployment rate series [MGSX] and GDP series [ABMI]. Figure reports the actual unemployment gap and the unemployment gap from Okun's specification estimated on annual data in levels. Potential output and natural rates based on Hodrick-Prescott filter with $\lambda = 100$. The full model coefficients are given in Appendix Table 6 Column (2).

the absolute value of the Okun's coefficient is estimated to be larger from 1982 to 1987 than in the years before and after that range. This suggests that the unemployment rate was higher in the early 1980s period than expected based on changes in GDP – a small decrease in the output gap led to a very large increase in the unemployment gap. This aligns with the results from the residual plots.

The anomaly of the 1980s is even apparent in a raw scatterplot of the data. Figure 17 gives a scatterplot of the output gap and unemployment gap using annual data with an HP filter of 1000. The observations from the 1980s are labeled. It is evident that the unemployment gap is higher than expected at all levels of the output gap, indicating a temporary shift in Okun's law during the 1980s period.

Subjecting the data from Britain to the rigorous tests for stability in the Okun's law relationship developed in Ball et al. (2017) thus leads to the conclusion that there was in fact a temporary shift in the Okun's law relationship in Britain during the early 1980s recession recovery. Regardless of whether the differences or levels method is used for Okun's law, whether quarterly or annual data is used, or whether a small or large HP smoothing parameter is used, the early 1980s had an anomalous relationship between output and unemployment. This makes it an extremely interesting case to analyze when exploring the

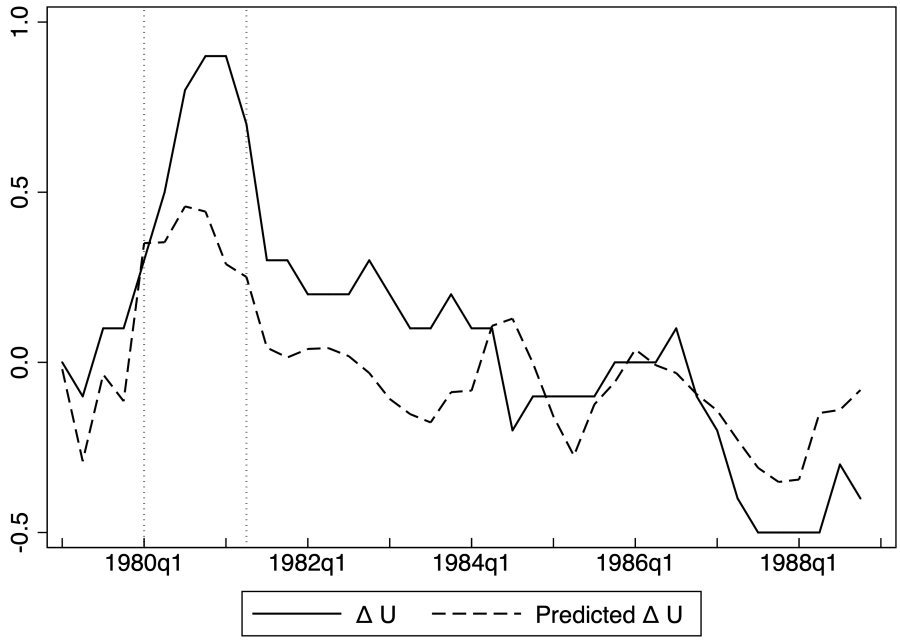
Figure 15: Actual and fitted unemployment rate gap, 1971–2018, quarterly data, levels method $\lambda = 1600$



Analysis using ONS unemployment rate series [MGSX] and GDP series [ABMI]. Figure reports the actual unemployment gap and the unemployment gap from Okun's specification estimated on quarterly data in levels. Potential output and natural rates based on Hodrick-Prescott filter with $\lambda = 16000$. The full model coefficients are given in Appendix Table 7 Column (3).

causes of jobless recoveries.

Figure 16: Actual and fitted change in unemployment rate, 1971–2018, quarterly data, differences method



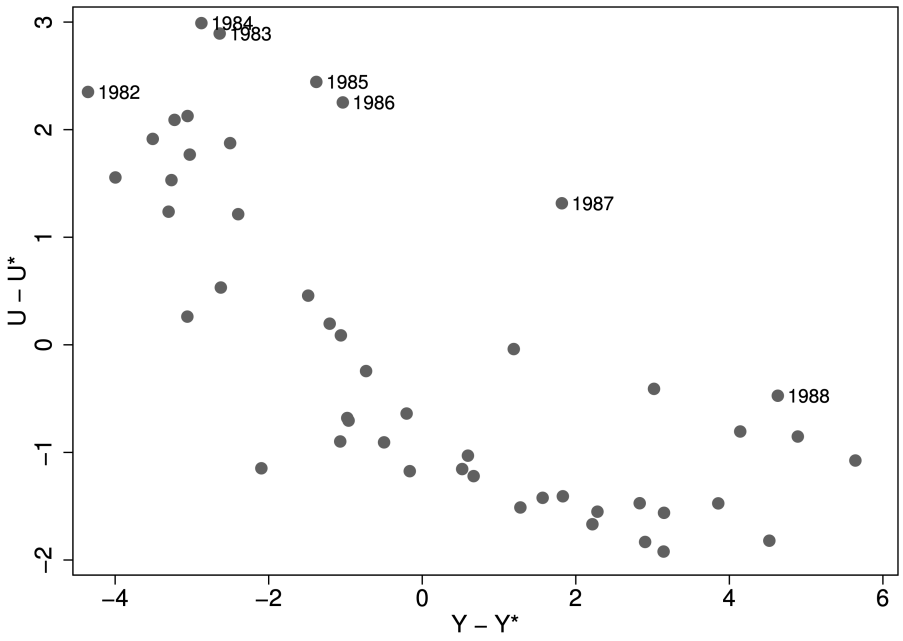
Analysis using ONS unemployment rate series [MGSX] and GDP series [ABMI]. Figure reports the actual change in unemployment rate and the predicted change in unemployment rate from Okun's specification estimated on quarterly data in differences. The full model coefficients are given in Appendix Table 7 Column (1).

Table 8: Okun's law estimates for Britain with early 1980s break (annual data: 1971–2018)

	(1) Differences	(2) Levels	(3) Levels
HP filter λ		$\lambda = 100$	$\lambda = 1000$
1982–1987=0 × ΔY_t	-0.3013***		
	(0.0766)		
1982–1987=1 × ΔY_t	-0.1694		
	(0.0857)		
(*a*) 1982–1987=0 × $(Y_t - Y_t^*)$		-0.3622***	-0.3563***
		(0.0588)	(0.0579)
(*b*) 1982–1987=1 × $(Y_t - Y_t^*)$		-0.5694**	-0.7586***
		(0.1618)	(0.1693)
Constant	0.0056**	-0.0003	-0.0009
	(0.0018)	(0.0014)	(0.0024)
N	47	48	48
Adjusted R^2	0.448	0.627	0.585
RMSE	0.007	0.007	0.010
Durbin-Watson	1.048	0.842	0.567

Newey-West standard errors in parentheses. * p <0.05, ** p <0.01, *** p <0.001. Column (1) gives the Okun's law estimates in differences with an interaction: $\Delta U_t = \alpha + \beta \Delta Y_t *$ "1982–1987" $+ \epsilon_t$, where "1982 – 1987" is a dummy for 1982–1987. Columns (2) and (3) are the Okun's law estimates in levels with an interaction: $U_t - U_t^* = \beta(Y_t - Y_t^*) *$ "1982––1987" $+ \epsilon_t$.

Figure 17: Scatterplot of output and unemployment rate gaps, 1971–2018

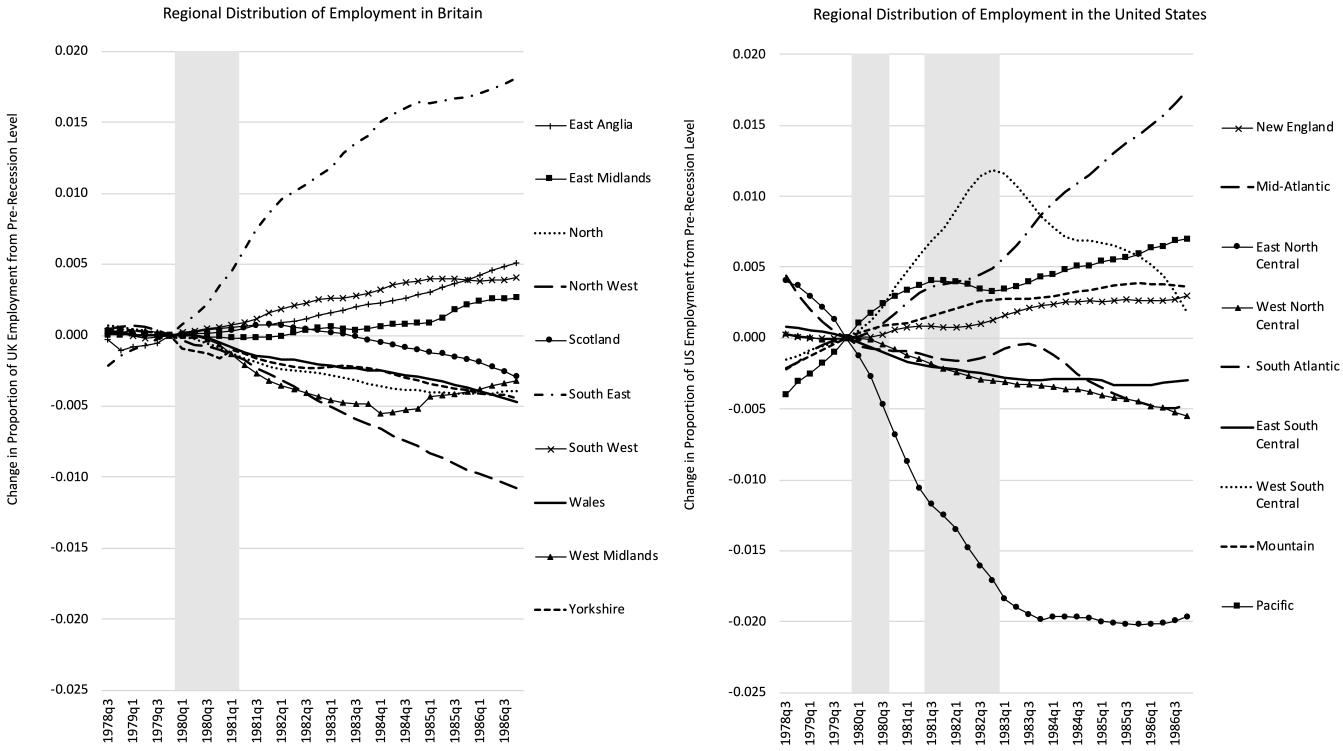


Analysis using ONS unemployment rate series [MGSX] and GDP series [ABMI]. Scatterplot gives the actual unemployment rate and output gap for every year 1971–2018. 1980s years are labeled. Potential output and natural rates based on Hodrick-Prescott filter with $\lambda = 1000$.

E Regional shifts in employment

Figure 18 shows the level change in the proportion of employment in each region in Britain and the US over the early 1980s recession and recovery. In both countries, the regional composition of employment changed significantly over the period.

Figure 18: Regional change in Britain and the United States, 1978–1986



Analysis using British data from the 1987 and 1989 *Employment Gazette* Historical Supplements and US data from the QCEW

In Britain, there was exceptionally rapid growth in the share of employment in the South East region including London. East Anglia and the South West also expanded their share of employment, and there was a slight increase in share for the East Midlands as well. In contrast, there was a consistent, dramatic decline in the share of employment in the North West over the period. The West Midlands, North, Yorkshire, and Wales regions all also had steadily contracting employment shares. While the regional changes in employment across Britain were likely affected by the business cycle downturn, there is little change in the pattern of adjustment once the recovery begins.

In the US, there was a steep decline in the employment share of the East North Central region (Illinois, Indiana, Michigan, Ohio, and Wisconsin) during the recession, tapering off during the recovery. In the

opposite direction, the employment share increased for the West South Central region (Texas, Louisiana, Oklahoma, and Arkansas) during the recession and then decreased during the recovery. The South Atlantic region (Maryland, DC, Virginia, Florida, Georgia, North Carolina, South Carolina, West Virginia, Delaware) had consistent employment share growth that picked up slightly during the recovery. Finally, the Pacific states, Mountain states, and New England states expanded their share somewhat over the period, while the West North Central, East South Central, and Mid-Atlantic states decreased their employment share.

Table 9: Change in regional share of employment over 1980s recession-recovery

	Share of Emp. Pre-Recession	Share of Emp. Post-Recovery	Level Change in Emp. Share
United Kingdom (1979q4–1987q3)			
South East and London	33.04%	34.75%	1.72
North West	11.86%	10.98%	-0.88
West Midlands	9.93%	9.47%	-0.46
Scotland	9.25%	8.90%	-0.34
Yorkshire	8.88%	8.40%	-0.48
South West	7.00%	7.58%	0.58
East Midlands	6.89%	7.09%	0.21
North	5.51%	5.08%	-0.43
Wales	4.55%	4.23%	-0.32
East Anglia	3.09%	3.51%	0.41
Total Establishment Employment	*22,580,250*	*20,997,750*	
United States (1979q4–1983q3)			
East North Central	19.32%	17.37%	-1.95
Mid-Atlantic	16.84%	16.80%	-0.04
South Atlantic	15.36%	16.12%	0.76
Pacific	14.57%	14.96%	0.39
West South Central	9.81%	10.77%	0.96
West North Central	7.61%	7.29%	-0.32
New England	6.19%	6.40%	0.21
East South Central	5.62%	5.32%	-0.30
Mountain	4.69%	4.97%	0.28
Total Establishment Employment	*72,567,312*	*72,392,348*	

Analysis using British data from the 1987 and 1989 *Employment Gazette* Historical Supplements and US data from the QCEW. Public administration and defense excluded. Data for the US is private sector only.

Table 9 shows the change in the regional distribution of employment for Britain and the US over the same recession-recovery periods as in Table 2. Comparing the regions with a growing employment share over the cycle, the South East region in Britain stands out for attracting significant employment growth, more than the top regions of the US. In contrast, there was a dramatic flight away from the East North

Central region in the US that was larger than that from declining regions in Britain.

F Job polarization

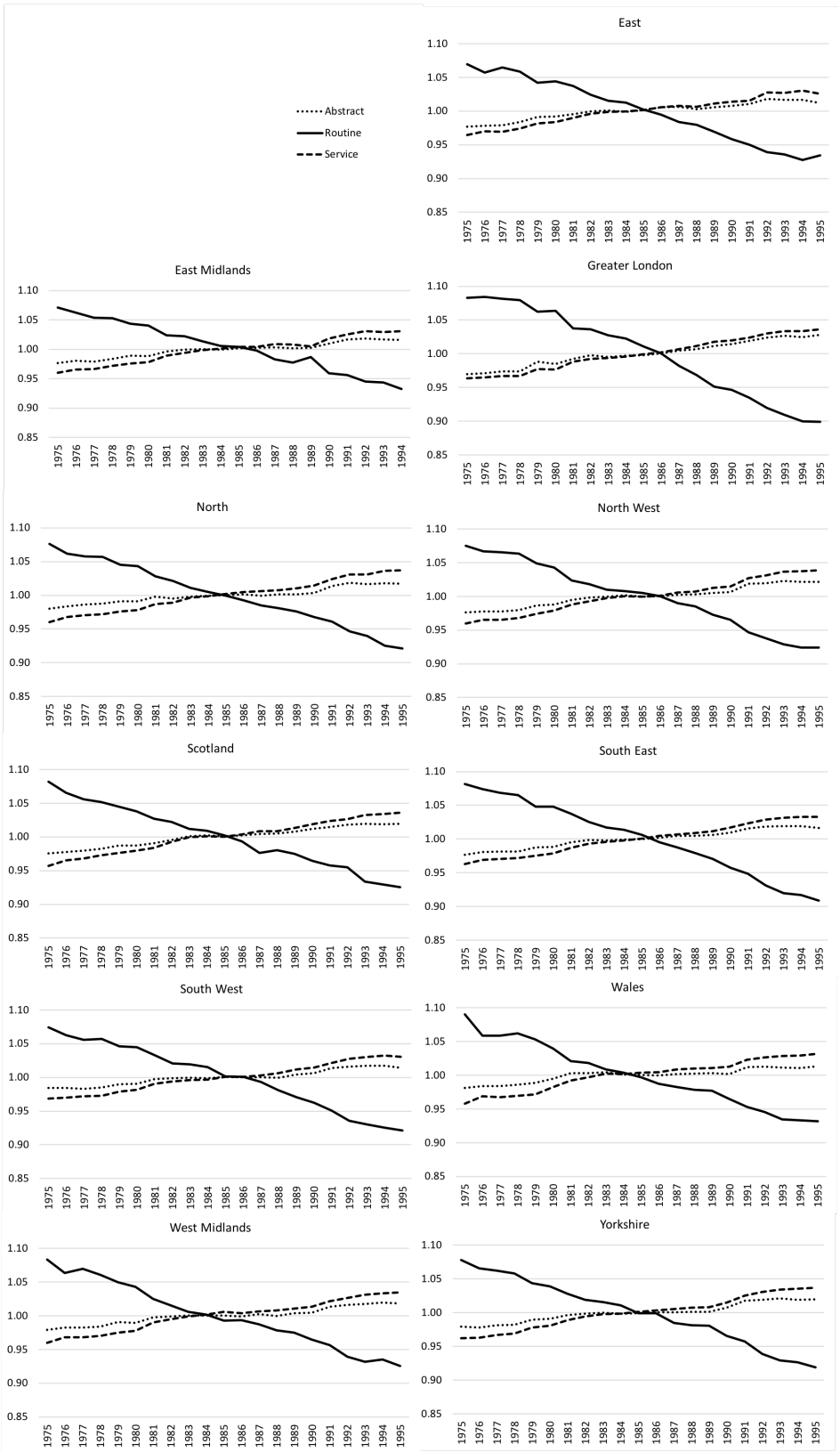
Figure 19 demonstrates that the trend in abstract, routine, and service tasks across occupations was extremely similar across regions of Britain.

Figure 20 gives the change in task composition by gender, which shows little difference. Figure 21 disaggregates between full-time workers and part-time workers. While the overall trend was the same, the decline of routine tasks in the part-time economy was not as steep as in the full-time economy.

For job polarization captured by shifts in occupational deciles, it is important to consider whether the results are robust to using different base years for the classification of average hourly earnings. I calculate the occupational rankings for four different base years — 1975, 1979, 1983, and 1987. Figure 22 gives the change in employment share by decile from 1975 to 1990 for each of these base years. All of the base years yield a similar U-shaped pattern of employment share change over the period, indicating that the general trend of job polarization is robust to different specifications of the base year.

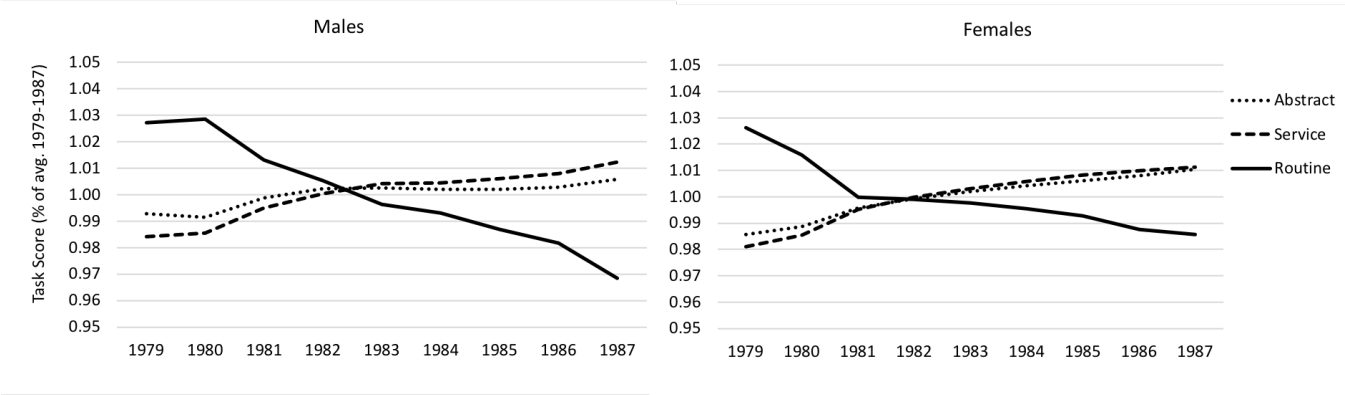
For the United States, we can also restrict the analysis of shifts in occupational deciles to their strict recession-recovery period of 1979–1984. Figure 23 gives the change in the share of employment from 1979 to 1984 in the US for occupational deciles based on average hourly earnings in 1979. This period represents the complete recession-recovery cycle for the US. There is no indication of a U-shaped pattern of employment share changes, indicating that job polarization was insignificant during this period.

Figure 19: Change in task composition in Britain by region, 1975–1995



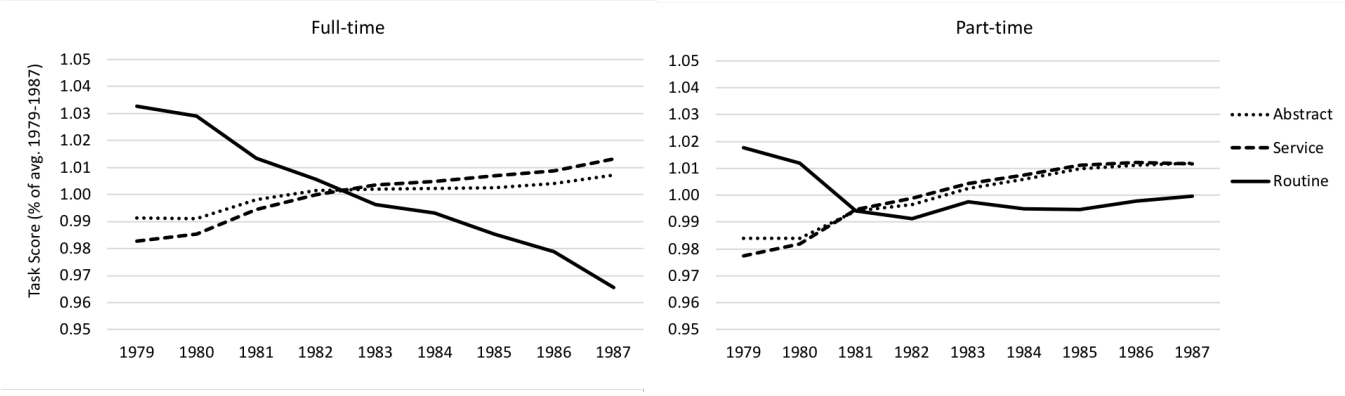
Source: ONS confidential ASHE data. Y-axis gives the task score as a percent of the average from 1975-1995.

Figure 20: Change in task composition in Britain by gender, 1979–1987



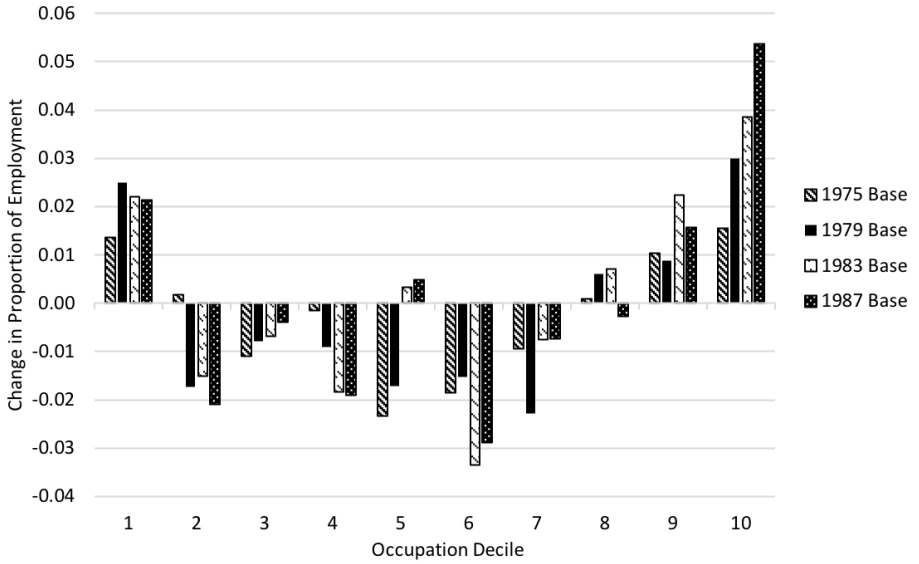
Source: ONS confidential ASHE data

Figure 21: Change in task composition in Britain by full-time status, 1979–1987



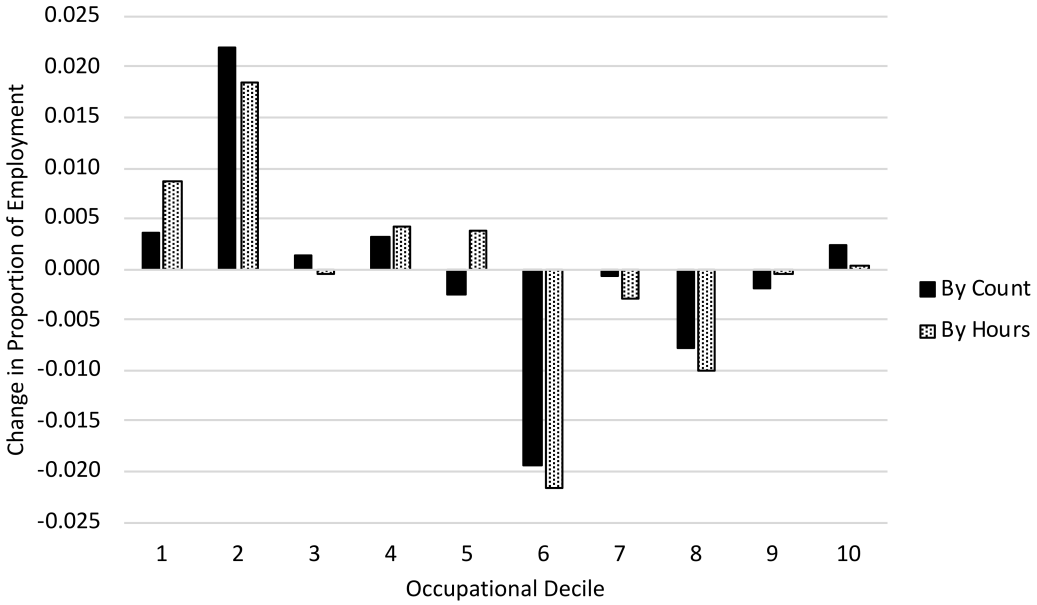
Source: ONS confidential ASHE data

Figure 22: Change in the proportion of employment by occupation decile in 1975, 1979, 1983, and 1987 in Britain 1975–1990



Source: ONS confidential ASHE data. Employment share is by count. Occupation deciles are calculated for four different base years — 1975, 1979, 1983, and 1987

Figure 23: Change in the proportion of employment by occupational decile in the United States, 1979–1984



Analysis using CPS May Supplement data

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