Labour Frictions in Interwar Britain: Industrial Reshuffling and the Origin of Mass Unemployment

Abstract

This article estimates the matching function of the British labour market for the period of 1921-1934. Changes in matching efficiency can explain both employment resilience during the Great Depression and the high structural unemployment throughout the interwar period.

Early in the 1920s, matching efficiency improved due to the development of the retail industry. However, the econometric results show a structural break in March 1927, related to a major industrial reshuffling that reduced the demand for workers in staple industries. Since these industries were geographically concentrated, there was an increase in the average distance between the unemployed and vacancies, and matching efficiency declined.

The labour market in interwar Britain is puzzling. On one hand, it showed a great degree of resilience during the Great Depression, as unemployment did not reach the huge level seen in other industrialized countries such as the United States or Germany, and it recovered from 1933 onward. On the other hand, unemployment was persistently high throughout the period despite a strong expansion of real income, consistent with significant structural unemployment. This dual scenario has led observers to put forward explanations such as labour frictions. These are the transaction costs between the two sides of the labour market: unemployment and vacancies.

Scholars pinpoint several potential frictions: high unemployment benefits (Benjamin and Kochin, 1979), institutional changes in the early 1920s (Hatton and Thomas, 2012), regional divergence (Booth and Glynn, 1975), and structural change in the composition of industry (Eichengreen, 1988). The nature and magnitude of such frictions, however, have not yet been quantified.

The primary purpose of this article is to answer the following two questions: firstly, how did matching efficiency in interwar Britain evolve, and secondly what were its main drivers? To the best of my knowledge, this article is the first to estimate the matching function for interwar Britain.

This paper uses a matching function framework to estimate the level of labour frictions in Britain for the period April 1921- June 1934. The matching function is a concept analogous to the production function. In this case, the unemployed and job vacancies are inputs to the number of matches (successful vacancies filled), which constitute the output. Matching efficiency is the capacity of the labour market to

transform the unemployed and vacancies into labour matches. In other words, matching efficiency is a measure of labour market frictions (Petrongolo and Pissarides, 2001).

The econometric results show that matching efficiency was highly variable between 1921 and 1934. This outcome explains both the high structural unemployment for the whole period, and the relative resilience during the Great Depression (1929-33). The fluctuations in labour frictions were strongly associated with a great industrial reshuffling, which came about as a result of the decline of export-oriented staple industries, and the increase in industries oriented to the domestic market (such as services). Incomplete worker mobility from the former to the latter was an important driver in the variability of matching efficiency and one structural cause for the high structural unemployment throughout the whole period. This article tests for a structural break, finding that the 1926 coal stoppage (May-December) was as a watershed phenomenon that accelerated regional labour markets' divergence, leading to a tendency towards decline in matching efficiency.

This article is comprised of six sections. The first section presents some stylised facts about unemployment in interwar Britain. The second section presents a literature review concerning matching efficiency and British interwar unemployment. The third part presents the theoretical and econometric framework of the aggregate matching function while the fourth section shows the econometric results. The fifth section analyses the reasons behind matching efficiency fluctuation following the conceptual framework developed by Barnichon and Figura (2015). Finally, the sixth section presents the conclusions.

I

Unemployment in the interwar period

British interwar unemployment featured persistently high rates compare to pre-1914 and post-1945 eras (Boyer and Hatton, 2002). During the 1920s and 1930s, there were cycles of rapid expansion in GDP per capita without achieving full employment, suggesting the existence of substantial structural unemployment. The macroeconomic literature links this phenomenon to rigidities in the wage setting mechanism, which meant that real wages did not fall enough to allow for full employment (Gali, 2011).

A prominent concept here is the non-accelerating inflation rate of unemployment (NAIRU). The NAIRU measures the minimum level of unemployment below which inflation would accelerate as a consequence of higher wages, which can be thought at as an indicator of the natural unemployment rate. According to Hatton and Thomas (2012), Britain saw a significant increase in the NAIRU in the interwar period. This is in line with the persistent high unemployment throughout these decades. They also show that the main adjustments in wages and prices were observed between 1920 and 1922, with only moderate fluctuating over the rest of the period. This pattern indicates that unemployment variations were likely due to other forces.

A second important characteristic of British interwar unemployment is its behaviour during the Great Depression. The labour market showed a high degree of resilience in the years immediately after 1929, despite a slow recovery during the 1930s. In

1929, the yearly industrial unemployment rates in Britain and the United States were 10.4% and 5.3%, respectively. This ranking was reverted in 1931, when unemployment had risen to 21.3% for the former and 25.2% for the latter. In 1932, the worst year of the Great Depression, the industrial unemployment rates were 22.1%, 36.2% and 43.8% for Britain, the United States and Germany, respectively (Eichengreen and Hatton, 1988). Clearly, the impact of the depression on employment was milder in Britain than for other leading industrialized countries.

Institutional changes

The first potential driver of labour frictions in interwar Britain were the institutional changes occurring in this period. Important as they were, however, most of the major institutional changes took place at the beginning of the interwar period, between 1919 and 1920. As a result, these reforms might explain the higher structural unemployment with regard to the pre-1914 period, but not the variability within the interwar period.

Interwar institutional changes can be divided in two types: those related to the costs of job search for the unemployed, and those that affected wage setting mechanisms. The main example of the former is the Unemployment Insurance Act of 1920, which established unemployment benefits for insured workers. The new framework replaced an older scheme which had been in force since 1911, expanding both weekly payments from 15 to 39 weeks (Garside, 1990 pp 36-43) and the number of workers insured. The coverage of Unemployment Insurance was extended to approximately 66% of the labour force (Thomas, 1988, p 99), and this level persisted for the whole interwar period[i].

This structure remained essentially unchanged during the entire interwar period, although there were scattered increases in the 1930s[ii]. This fact led some observers to conclude that the unemployment benefit generosity was the reason behind the structural unemployment in the 1930s (Benjamin and Kochin, 1979). Econometric evidence, however, shows no evidence of a link between unemployment benefits and the incidence of unemployment (Hatton and Bailey, 2002; Eichengreen, 1986).

The second set of relevant institutional changes are those related to trade unions and trade boards, which could have affected employment performance thanks their influence on wage bargaining agreements.

Trade unions experienced an important transformation during the trans-war and early interwar period. According to Hatton and Thomas (2012), there was a significant increase in the trade union density (members as a share of the labour force), between 1913 and 1920 (from 22% to 44%), before a decline to the pre-war levels (24% in 1931) (Bain and Price, 1983). If the rise of the trade union density had an impact on employment, it is plausible to assume that this influence was dissipated as membership declined through the 1920s[iii].

Another important institutional change arrived with the Trade Boards Acts of 1918. According to Hatton and Thomas (2012), in trades and occupations without proper structure (i.e. without trade unions), the trade boards acted to fix a minimum wage. They record that there were 63 trade boards in 1921 which covered 3 million workers. Considering both structures (trade unions and trade boards), Thomas (1992, p. 278) estimates that half of the workforce was covered by some kind of collective bargaining agreement in 1920. Yet their coverage declined to 44% in 1937.

Despite their potential importance, the effect of the trade unions and trade boards on wage setting was constrained by the large fragmentation of these institutions in many organisations, with limited capacity for coordination (Hatton, 1988; Thomas, 1992). As in the case of unemployment insurance, it is plausible to assume that the most significant impact of these institutions occurred during the trans-war period rather than the interwar period.

Institutional changes could have interacted with other frictions, such as geographical or skill mismatch between employers and unemployed. Yet institutional changes themselves are unlikely to explain the complete story behind the dynamics of interwar unemployment, which is why other factors need to be analysed.

Regional and industrial differences

Figures 1 and 2 map unemployment rates for insured workers in Britain's main regions for June 1924 and June 1930. Figure 2 shows a clear geographical divide in unemployment by 1930. The highest unemployment rates were in the Northern regions and Wales. London, the South, and to a lesser extent the Midlands, had much lower unemployment rates after the 1929 shock. These regions recovered quickly, in particular the South-East, which was probably very near to full employment in June 1936.

Here Figure 1

Here Figure 2

That regional differences were amplified during the 1920s can be seen contrasting Figures 1 and 2, and is supported by the econometric results in section IV. High unemployment regions were associated with the importance of the five great staple industries (coal mining, cotton, shipbuilding, mechanical engineering and iron). The decline of these industries generated a mass of the unemployed that was not fully able to migrate to other sectors.

Table 1 shows the unemployment rates for selected years (July) between 1921 and 1933 for the 17 biggest industries[iv] recorded in the National Unemployment Insurance scheme. An unemployed person was considered part of the industry of her last employment. In July 1932, the highest unemployment rate (63.8%) was observed in the shipbuilding and ship-repairing industries, which were heavily affected by the collapse of world trade. Unemployment rates were also high in metal manufacturing and mining, at 44% and 40.1%, respectively.

Here table 1

The industry with the lowest unemployment rate in July of 1932 was banking and finance, at 5.5%. Utilities and distributive trades also had a relatively good performance, with unemployment rates of 10.9% and 11.6%, respectively. In the main, the industries with low unemployed rates were either geographically spread or slightly concentrated in the South. This was a fundamental difference to important depressed trades, such as mining or textiles, which were located mainly in the North.

II

Economic historians have presented different explanations for structural unemployment in interwar Britain, but all of them stress the importance of labour frictions.

Hatton and Thomas (2012) estimate that NAIRU increased from 5.7% to 9.5% after 1921 and remained at this level for the rest of the interwar period, a finding that indicates the presence of labour frictions that were absent in the past.

The authors compare the experiences of the United Kingdom and the United States in the 1921 crisis and the Great Depression. According to Hatton and Thomas (2012), the differences between the two countries are explained by the interaction between shocks and labour market institutions. In their view, the institutional changes introduced at the beginning of the 1920s in Britain increased the level of labour frictions, and their adverse effect on employment was triggered by the 1921 crisis. As these institutional changes did not occur in the American economy, the United States labour market was able to fully recover from the early 1920s crisis. The opposite took place in the 1930s; the United States set up new regulations with the New Deal, while Britain did not adopt any additional institutional changes.

The interaction between labour institutions and shocks is an important element in understanding the evolution of unemployment. Yet the precise transmission mechanisms and their magnitude remain unclear.

A potential mechanism is presented by Benjamin and Kochin (1979), who link the high unemployment observed in interwar Britain with the generosity of the

Unemployment Insurance. The authors found that the replacement rate[v] was a positive and a significant determinant of unemployment for adult male workers.

Eichengreen (1986) put forward a microeconometric estimation of the determinants of unemployment incidence for 27,000 male individuals from the *New Survey of London Life and Labour* (NSLLL), between 1929 and 1931. He found a positive and significant relationship between unemployment incidence and the replacement rate, although too small to explain the mass unemployment of the interwar period.

Hatton and Bailey (2002) followed Eichengreen's approach but with a larger dataset with more variables. They did not find a significant relationship between the replacement rate and unemployment incidence once occupation and skill level are controlled for. This result indicates how relevant these latter variables are in accounting for individual job-finding rates.

Interwar unemployment was geographically concentrated, which is why Booth and Glynn (1975, p 611) considered it essentially a regional problem. They emphasize that outside of the depressed regions, Britain saw unemployment rates probably not very different from the pre-1914 period.

A potential relief for regional depressed labour markets could have been a significant migration to the South, but this did not occur. The reasons behind the low internal migration are part of the puzzle of the persistent regional unemployment differentials in interwar Britain, and there is still no convincing explanation. The existence of subsistence income provided by unemployment insurance could have reduced the

incentive to migrate, but other factors, such as skills or housing, need to be considered.

The most relevant study on matching efficiency during the interwar period was conducted by Lee (2016), who estimated the matching function in the United States for the period of 1924 and 1932. Using city-month level data on unemployed, vacancies and new hires, he finds no evidence of declining matching efficiency with the Great Depression, at least in its early phase. One interesting result is that the elasticity of the unemployed over the number of matches is estimated at 0.1, meaning that the matching function largely depended of the number of vacancies, and therefore the mass unemployment in the 1930s was mainly due to depressed aggregate demand rather than labour frictions.

III

The matching function and matching efficiency

In a standard model of matching (Pissarides, 2000), the matching function is represented by equation (1):

$$M(U_t, V_t) = \Omega U_t^{\xi} V_t^{1-\xi} \quad (1),$$

where M is the number of matches, U_t is the number of unemployed, V_t is the number of vacancies, Ω is an efficiency factor and ξ is the elasticity of the unemployed over the number of matches. Equation (1) is a Cobb-Douglas function with constant return

to scale, an assumption supported by evidence in Petrongolo and Pissarides (2001) regarding the structure of empirical matching functions.

Ω is matching efficiency and captures the extent of labour frictions or the number of matches which are not explained by unemployment or vacancies. This constant could be interpreted as the technology through which the unemployed and vacancies are transferred into new matches. ξ measures the elasticity of the number of matches to a change in the number of unemployed.

Equation (2) denotes the job-finding rate for the unemployed:

$$f_t = \frac{M_t}{U_t} \text{ (2)}$$

Combining equation (1) and (2),

$$f = \frac{M(U_t,V_t)}{U_t} = \left(\frac{V_t}{U_t}\right)\left(\frac{M_t}{V_t}\right) = \Omega\theta_t^{1-\xi} \text{(3)},$$

where $\theta_t = \frac{V_t}{U_t}$, is a measure of market tightness

Taking logarithms at equation (3) yields

$$\log(f) = \log(\Omega) + (1-\xi)\log(\theta_t) + u_t \text{ (4)}$$

The monthly deviations from the average matching efficiency Ω are described by equation (5):

$$\mu_t = \text{Log}\Omega_t - E_t\text{Log}\Omega_t \text{ (5)}$$

where $E_t \mathrm{Log}\Omega_t$ is the expected value of Ω_t, or the intercept in the econometric estimations.

There are several potential determinants of matching efficiency deviations μ, but in order to provide a systematic analysis this article will follow the conceptual framework developed by Barnichon and Figura (2015). They developed an analysis of matching efficiency across labour market segments. A segment is a group of workers within a specific district and industry, such as workers in the retail industry in London. The authors argue that matching efficiency is affected by two factors: heterogeneity across workers and segments' dispersion.

The former measures the variation in matching efficiency due to the composition of the unemployed pool. If the pool of unemployed has a lower job-finding rate than the labour force (due to a high share of groups with a low job-finding rates), then friction in the labour market increases and matching efficiency declines. If for example female workers have a lower job-finding rate and higher separation rate[vi] than the male workers, they will also experience a higher rise in their unemployment rate during an adverse economic shock. The overrepresentation of this group in the unemployed pool causes the matching efficiency to be lower during the recovery than prior to the crisis.

The second set of determinants considered by Barnichon and Figura (2015) is the segments' dispersion. This factor measures the friction caused by the geographical or skill mismatch between the unemployed and vacancies. In this case, the unemployed and firms with open vacancies are in different locations or industries, with lower availability of suitable matches.

Any economic crisis affects some industries and occupations more severely than others, generating newly unemployed workers with the skills demanded precisely in those industries with a high unemployment rate. If such industries are facing an adverse business cycle, then migration to other industries requires time and adaptation, which leads to a decline in matching efficiency. In this situation, the unemployed have a skill endowment which is different than that looked at by the firms to cover their vacancies.

Similarly, the high variation in regional unemployment rates in Britain after the depression indicates the importance of geographical dispersion as a source of labour market friction.

Barnichon and Figura (2015) also developed the concept of permeability, which means the degree of mobility from one segment to another. The higher the degree of permeability between segments, the higher the matching efficiency and the resilience of the labour market. In the presence of high permeability, workers who become unemployed can move quickly towards segments with open vacancies.

Unfortunately, this article cannot fully replicate Barnichon and Figura's methodology, because the information about segments is not available. The econometric estimations control for a set of variables, whose nature can be associated with either heterogeneity across workers or segments' dispersion. In the former group are variables including gender, age or unemployment duration, while in the latter are the shares of unemployed from specific industries.

IV

Data and Econometric estimation

Inserting control variables X_t in equation (4) yields

$$\log(f) = \log(\Omega) + (1 - \xi)\log(\theta_t) + \beta X_t + u_t \quad (6),$$

The differences between the estimated job-finding rate and the actual job-finding rate are the deviations of aggregate matching efficiency described in equation (5).

To control for heterogeneity across workers, the regressions include the female share of the unemployed, the juveniles share of the unemployed, and the share of temporary stoppages in the unemployed pool. Unemployment insurance split the unemployed population between those who were *wholly unemployed* and *temporary stoppages*. The latter retain some link with their last employer and were called back once the situation improved (Thomas, 1988). In the main, *temporary stoppages* were workers suspended for a period of a maximum of 6 weeks.

The explanatory variables associated with segments' dispersion are the share of unemployed coming from mining, the share of unemployed coming from textiles, the share of unemployed coming from these two trades, and the share of insured workers coming from distributive trades.

The data used for estimations were taken from *the Labour Gazette*, a Ministry of labour publication. These statistics were gathered monthly from the labour exchanges, which were government offices in charge of facilitating the matching between the unemployed and firms for the population affiliated with Unemployed

Insurance. The coverage of this scheme was around 66% and remained stable for the entire interwar period. For this reason, it is plausible that information taken from such exchanges is broadly representative of the labour force.

This article uses monthly data between April 1921 and June 1934. The latter was the last month that the *Labour Gazette* presented information about unemployment flows, which are essential for the matching function estimation. The Labour Gazette does not show information about unemployment flows between May 1926 and May 1930. Results presented here replace missing flows with estimates based on the Holt-Winters[vii] method (Winters, 1960), which in this case is equivalent to a linear interpolation. Data for other variables is complete.

Equation (6) was estimated using Ordinary Least Squares models. The series of the logarithm of the job-finding rate was evaluated for stationarity using the Dicky-Fuller test. The null hypothesis was rejected, indicating that this variable is stationary.

Results

The econometric results for equation (6) are shown in Table 2. Model 1 presents the results for the standard aggregate matching function without additional controls, as it is shown in equation (4). For this model, the coefficient of the elasticity of the unemployed ξ is 0.274, indicating that the number of new matches is mainly sensitive to the variation in the number of vacancies. This coefficient increased significantly in the measure when more dependent variables were incorporated in models 2 and 3, and is significantly higher than in the United States (0.1) for a similar period (Lee,

2016). This finding supports the notion that labour market frictions were initially lower in the United States than in Britain (Hatton and Thomas, 2012).

Here table 2

Model 2 incorporates the variables associated with heterogeneity across workers, while model 3 adds also controls for segments' dispersion. The coefficients for the juvenile share of the unemployed are positive and consistently significant, indicating that this group had a higher job-finding rate than the average of the labour force. The coefficients for the female share of the unemployed are negative in both estimations, but become much less significant once I add controls for the share of unemployed coming from the textile industry. This shows that besides a lower job-finding rate for this group itself, they were overrepresented in the unemployed pool because their major employer was a depressed sector. The share of temporary stoppages in the unemployed pool is negative and significant for both models. Yet this coefficient is sensitive to the incorporation of the explanatory variables associated with the segments' dispersion as is set out in section V.

The monthly deviations of matching efficiency for models 1 and 3 are presented in Figure 3. It can be observed that the efficiency levels increased during the first half of the 1920s, particularly after the 1921 crisis. There was a substantial decline in matching efficiency after the Great Depression, as was observed after the Great Recession of 2009 (Daly, Hobijn, Sahin, Valletta, 2012; Davis, Faberman, and Haltiwanger, 2013). The sharp decline of matching efficiency after 1929, was followed by a recovery in late 1931, although it decreased again from late 1932

onwards. This additional decline is likely associated with the rise in long-term unemployment, revealing the importance of the heterogeneity across workers factors. Yet, it does not explain why in late 1931, matching efficiency moved to a level similar to that of the late 1920s.

Here Figure 3

More interesting than the expected fall in matching efficiency in 1929, is the trend change in the second half of the 1920s. Matching efficiency fell from early 1927, well before the 1929 October shock, when there was a significant decline relative to the levels observed in the first half of the 1920s.

Structural break

A Supremum Wald test (Vogelsang, 1997) was used to detect a structural break at an unknown date. This test estimates the month when the probability of a structural break is the highest.

Here table 3

The results of this test show the most probable date for the structural break was March 1927, when the country started to recover from the 1926 coal stoppage. This strike, which lasted eight months from May to December, was a watershed in British

labour history. It suspended the coal supply for a range of industries, which soon entered into decline. The impact was especially significant in the metal and cotton industries, which were located mainly in the North, and relied heavily on coal to operate.

This result points out that the two halves of the 1920s were very different in terms of labour market frictions. This was a result of an uneven recovery from the 1926 coal stoppage, a profound shock which involved more than one million miners. In the second part of the 1920s, high unemployment rates in the northern districts, and Wales coexisted with low unemployment rates in the southern districts, and to a lesser extent in the Midlands.

This difference in unemployment incidence was exacerbated following the Great Depression, but the results of matching efficiency and the structural break test indicate that the roots of the regional divergence were in the mid-1920s. The problems in the backbone industries, combined with the lack of mobility of those who were unemployed towards new emerging industries, were probably the main reason behind the high structural unemployment in interwar Britain. It is in this lack of inter-regional mobility, when segments' dispersion factors are essential in solving the British interwar unemployment puzzle.

V

To analyse the role of the segments' dispersion in matching efficiency in more detail, it will be assumed that fluctuations depend on three factors: the job-finding rate, the permeability, and the size of each industry in the economy.

If an industry has a job-finding rate higher than the average of the overall workforce, it will be called a *driver* since it contributes to an increase in matching efficiency. On the other hand, if an industry has a job-finding rate lower than the average of the entire workforce it will be called a *brake,* since it reduces matching efficiency. Unfortunately, it is not possible to estimate the job-finding rate for each industry since there is no information about unemployment flows in each of them. In that case, the unemployment rate will be used as a proxy for the job-finding rate. It will be assumed that these industries with high unemployment have a low job-finding rate, and vice-versa.

The classification between *driver* or *brake* will be based on their outcome relative to other sectors over the period under consideration. Industries such as shipbuilding or textiles had higher unemployment rates for all of the thirteen years that were analysed, than the average of the total labour force. On the other hand, industries such as clothing, or retail trades had unemployment rates lower than the mean of the total labour force for the entire period. A few industries had mixed outcomes, and in these cases, they were classified based on their outcome for most years.

Permeability is the capacity of an industry to provide employment for people, regardless of their skills or location. Since human capital development requires time, it is reasonable to assume that the higher the skill requirements, the lower the industry permeability will be. Geographical spread is also another condition for an industry to be permeable. Since workers' mobility has a cost, it is likely that the geographical proximity between segments has a positive impact on matching

efficiency. In this case, the nearer a vacancy is located, the lower the degree of friction.

Table 4 represents a summary of this theoretical framework. A permeable industry is one that is oriented to medium or low-skilled workers, and is geographically spread.

Here table 4

This article classifies the fifteen major industries (in insured workers terms) by skill and geography, whose details are shown in Appendix 1. For the classification of skill categories, the occupation distribution by industry elaborated by Routh (1965) based on the 1951 census was used. Likewise, the geographical distribution of insured workers in December 1926, was used for the classification of the levels of geographical concentration in each industry. As a consequence of the General Strike and the 1926 coal stoppage, the Ministry of Labour conducted a study concerning the impact of the shock on other industries at the time. The outcome of the survey, which was published in the *Labour Gazette* of January 1927, is used to geographically classify the sectors.

In addition to the job-finding rate and permeability, a third factor, which is important in the behaviour of matching efficiency, is the size of the industry. In order to reduce the labour frictions, the labour market needs permeable drivers large enough to have a positive impact on the aggregate matching efficiency.

Figure 4 shows the results regarding permeability and size for these industries, considered as *drivers* of matching efficiency. The horizontal axis presents a measurement of geographical concentration, while the vertical axis represents the skill class levels. The size of the circles represent the share of insured workers in June 1926.

Here Figure 4

In the interwar period, several industries were permeable drivers, but it was the retail trades which had the largest share in terms of insured workers. This industry, which had a high proportion of low-skilled workers and was geographically spread, grew rapidly in the first half of the 1920s, leading to a significant improvement in matching efficiency.

On the other hand, the results concerning the permeability of industries considered as *brakes* are presented in Figure 5. The most important *brake* industries (mining and textiles) in terms of insured workers were non-permeable due to the fact that they were geographically concentrated. The decline of these industries in the second half of the 1920s left a significant share of insured workers unemployed, and far away from locations with job vacancies. This increase in the average distance between the unemployed and job vacancies laid behind the decrease in matching efficiency in the second half of the 1920s.

Here Figure 5

The retail revolution

Retail experienced a boom during the interwar period, but especially throughout the 1920s. In this decade, the industry evolved from local stores towards national chains. The increase in purchasing power and the adoption of mass consumption required the development of a sophisticated distribution channel, able to reach a wide consumer base. The development of mass production technology led to a separation between the production and distribution tasks due to an increase in the size of firms, and standardisation of products (Jefferys, 1954).

The share of insured workers in the retail industry was 13.9% in 1929, up from 7.9% in 1921. At the end of the 1920s, the retail industry became Britain's main employer, a position historically occupied by the textile industry. This massive incorporation of new workers and unemployed into the retail sector would be the key to labour market resilience during the Great Depression. By then, tens of thousands of workers were located in an industry mildly affected by the crisis. In July 1932, when unemployment was at its highest, the unemployment rate in the retail trade was only 11.6% while for the insured population the rate was 22.8%.

Despite such an important contribution to matching efficiency, the retail industry could not prevent a structural decline after March 1927, as its influence was mainly seen in the early 1920s. Between July 1921 and 1926, the number of insured workers in the retail trade increased by 56.1%, while between July 1926 and 1929 it only increased by 11.1%. This moderation in the expansion of retail coincided with the structural break in matching efficiency.

It is likely that this industry continued to exert a positive influence on matching efficiency in the second half of the 1920s. Yet it did not grow strongly enough to compensate the crises in the mining and textiles industries. The retail's share in insured workers continued expanding throughout the 1930s, although at a slower pace than in the first half of the 1920s, when the industry incorporated almost half a million workers.

Coal mining and textile's decline and the deterioration in matching efficiency

The bad performance of the great staple trades was constant throughout the 1920s. Yet it was with the general strike (May 1926) and the 1926 coal stoppage that these industries started to have a significant negative impact on matching efficiency.

Most of the industries shown in Figure 5 are classified as intensive in mid-skilled workers, which implies that the main difference between them was geographical concentration. There were industries such as mining and textiles which were significantly concentrated precisely in the depressed areas in the North, Scotland and Wales. On the other hand, there were *brakes* such as engineering or building, largely spread over the whole of Britain. This difference in geography explains the difference in the unemployment dynamic in the two halves of the 1920s.

Between 1921 and 1926, a significant share of the unemployed came from industries with low geographical concentration. In July 1921, engineering, iron-founding and metal trades were the industries with the highest share in the pool of unemployed workers (29.5%). In July 1925 this share was, however, only 16.9% and it continued

to decline in the second half of the decade to up to as little as 13.3% in July 1929. To a large extent, this decline was due to this group of industries reducing their number of insured workers by more than 450.000 between 1921 and 1925, rather than by a significant improvement in their operation. Although many of them left the labour force, others doubtless migrated to industries with better prospects such as retail, which in the same period saw an increase in the number of insured workers by more than 490.000 individuals.

In the second half of the 1920s, the unemployed came mainly from industries which were highly geographical concentrated. Two industries, mining and textiles, accounted for around one-third of the unemployed between July 1926 and July 1929. Yet it was mining which contributed the most to the structural break in matching efficiency.

In the first half of the decade, the unemployment rate in the mining industry was below the national average. However, in 1925 problems in this industry began with the restoration of the Gold standard (April 1925), leading to the general strike in May 1926 and the coal stoppage during most of 1926 (McIlroy, Campbell and Gildart, 2004). In July 1927 and 1928, the unemployment rate in coal mining was 19.9% and 26.8%, respectively, while the national rates were 9.1% and 11.6%. In those two years, almost one in four of the unemployed came from the coal mining industry. Many of these unemployed were *temporary stopped* which after 1929 became *wholly unemployed*, and likely became long-term unemployed after 1931. Here was planted the seed of a *bifurcated* labour market in Britain as described by Thomas (1988).

As in coal mining, the textile industry was highly concentrated in geographical terms, which is why it was a non-permeable *brake* and was costly to leave. Due to the sizes of these industries, their impact on matching efficiency was probably substantial. In addition, the textile industry used the temporary stoppages institution intensively. This fact, which at first sight may appear to have relieved the problem, could have increased expected the unemployed costs of migrating to the service sector in the South.

The unemployed in the first half of the 1920s had a different profile from those in the second half. Throughout the whole decade, the unemployed came from mid-skilled groups, but after 1926 they started to a large extent to emanate from specific regions. In this sense, the structural break of matching efficiency is associated with regional divergence, which significantly increased the mobility cost between industries.

Industrial composition and matching efficiency

Two additional models were estimated incorporating interactions between dummies, after and before the structural break, and explanatory variables associated with the segments' dispersion. Model 4 incorporated an interaction between the share of unemployed coming from the textile and mining industries and a dummy for the months after the structural break. The coefficient for this new variable is negative and significant, indicating how important these industries were in explaining the decline in matching efficiency after March 1927.

Once the interaction is incorporated into the estimations, the coefficient for the share of temporary stoppages becomes positive, which is probably due to the fact that this kind of unemployed workers was more common in the five great staple industries after the 1926 coal stoppage. These industries had between 70% and 80% of the total of *temporary stoppages* between July 1926 and July 1934.

Here table 5

Model 5 included an interaction between the share of insured workers coming from distributive trades and a dummy for the months before the structural break. The coefficient for this new variable is positive and significant, indicating that the increasing population working in the distributive trade was the main driver behind the improvements in matching efficiency in the first half of the 1920s.

The results shown in table 5 are useful for solving the puzzle of unemployment in interwar Britain. They indicate that there was a significant change in the second half of the 1920s which generated two different groups displaying opposite trends. The first group comprised the workers with a high job-finding rate and to a great extent, was located in the South. Within this group, there were many workers who successfully moved to an industry with a high permeability, as occurred in the retail industry during the first half of the 1920s. This is why the retail revolution was at the core of the British labour market resilience during the Great Depression. The distributive trades not only had a good performance during the whole interwar period but were also highly permeable, which allowed a relatively fast recovery in the 1930s once the aggregated demand started to grow.

The second group consisted of those workers with a low job-finding rate, many of them located in the North and working in the great staple industries. These workers were not able to move to more resilient segments in the 1920s. Within this group, many workers became *temporary stoppages* in the second half of the 1920s, *wholly unemployed* after 1929 and eventually long-term unemployed in the 1930s. The size of this group can explain the high structural unemployment in interwar Britain. Their weak position as a result of the mining and textile decay in the second half of the 1920s, left them in a fragile position for the strong shock of the Great Depression.

VI

The analysis of the labour frictions through the matching function offers a plausible explanation for both the structural unemployment in interwar Britain, and the labour market resilience found throughout the Great Depression.

As the econometric results show, there was a structural break in matching efficiency in the middle of the 1920s, indicating two very different periods in this decade. The first half of the 1920s was characterised by significant improvements in matching efficiency, while the second saw a significant worsening in this variable. During the interwar period, matching efficiency fluctuations were determined largely by the segments' dispersion factor, generated by the industrial reshuffling observed.

Such industrial re-composition in the 1920s increased the demand for workers in those industries oriented to the internal market. At the same time, industrial re-composition reduced employment in industries oriented to exports, which had

formed the core of economic prosperity since the time of the Industrial Revolution. This process increased the distance between unemployment and vacancies in terms of geography.

This geographical mismatch appears to be the structural determinant of the worsening of matching efficiency after March 1927 and ultimately the reason behind the high structural unemployment in interwar Britain. The lower matching efficiency in the second half of the 1920s was largely influenced by the problems in coal mining and the textile industries. The high incidence of the unemployment of workers in these industries explains the high and persistent unemployment rates in the Northern districts, Scotland and Wales; these rates contrast with the resilience of the Southern districts, London and the Midlands. In this period, the unemployed and job vacancies were separated by geography, presenting a significant difference with the first half of the decade when the unemployed were more geographically spread.

On the other hand, in the first half of the 1920s matching efficiency saw significant improvements. What led to such progress was the emergence of the modern retail industry, which was able to absorb a significant share of the unemployed and newcomers to the labour force. The retail industry was a highly permeable industry as it required large numbers of low-skilled workers and were geographically spread, which is why their growth reduced the degree of labour frictions. In addition, the retail industry was mildly affected by the Great Depression, which explains the resilience of the British labour market during the early 1930s.

Appendix 1

For the classification of skill categories, the occupation distribution by industry elaborated by Routh (1965) based on the 1951 census was used. The occupations classified as professionals (category 1) and clerical workers (category 3) are considered to be high-skilled workers. The occupations classified as foremen, supervisors and inspectors (category 4) and skilled manual workers (category 5) are considered mid-skilled workers, while semi-skilled (category 6), and unskilled (category 7) are considered low-skilled workers. Category 2 (employers and propitiators) was excluded from the analysis due to its inclusion of high and low skilled workers

The difference between the percentage of workers in each occupation and the percentage of workers in each occupation for all of the insured population was estimated and normalised (at this latter value) for each industry. For instance, the share of clerical workers in the chemical industry is 16.02%, while the share for all the insured population is 10.85%. The difference between the two values (normalised in the latter) was estimated at 47.6% which means that the chemical industry has 47.6% more clerical workers than the average of all other industries, and therefore these kinds of workers are over-represented. This article considers the category with the highest over-representation in each industry for its skill classification.

The geographical distribution of insured workers in December 1926, was used for the classification of the levels of geographical concentration in each industry. As a

consequence of the General Strike in May 1926 and the coal stoppage, the Ministry of Labour conducted a study concerning the impact of the shock on other industries at the time. The *Labour Gazette* published the outcome of the survey in January 1927. This study classified insured workers into three main regions in Britain: group 1 was composed of the Northern Districts, Scotland and Wales; group 2 was comprised of the South-West and the Midlands, and group 3 was made up of the South-East and London. These groups had a worker share in the insured population of 52.5%, 22.2% and 25.3%, respectively.

The difference between the share of insured workers in each industry and the share of all insured workers was estimated. Then, the variance of these three values for each industry was estimated. If the variance for an industry was higher than the average for all industries, then this industry was considered geographically concentrated.

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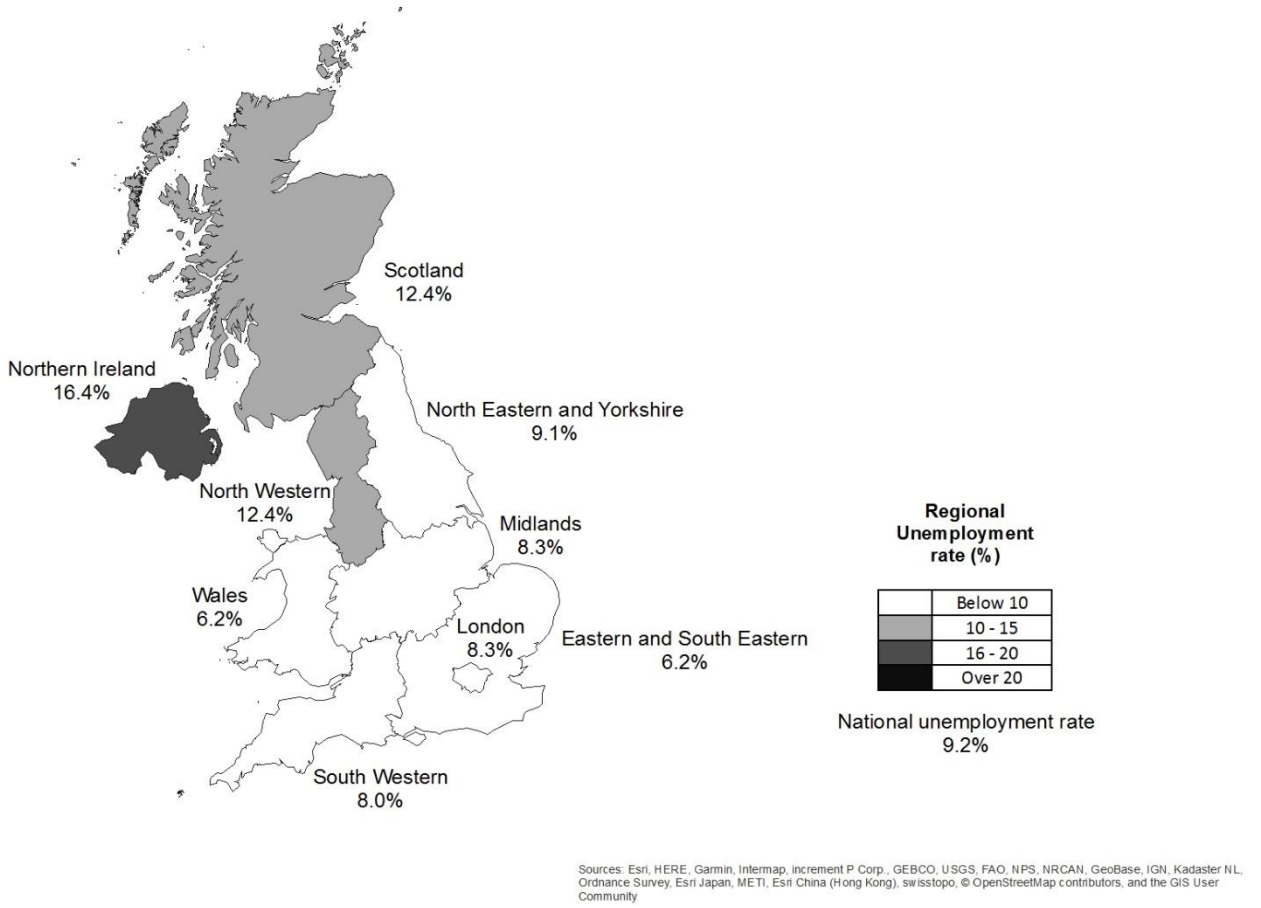
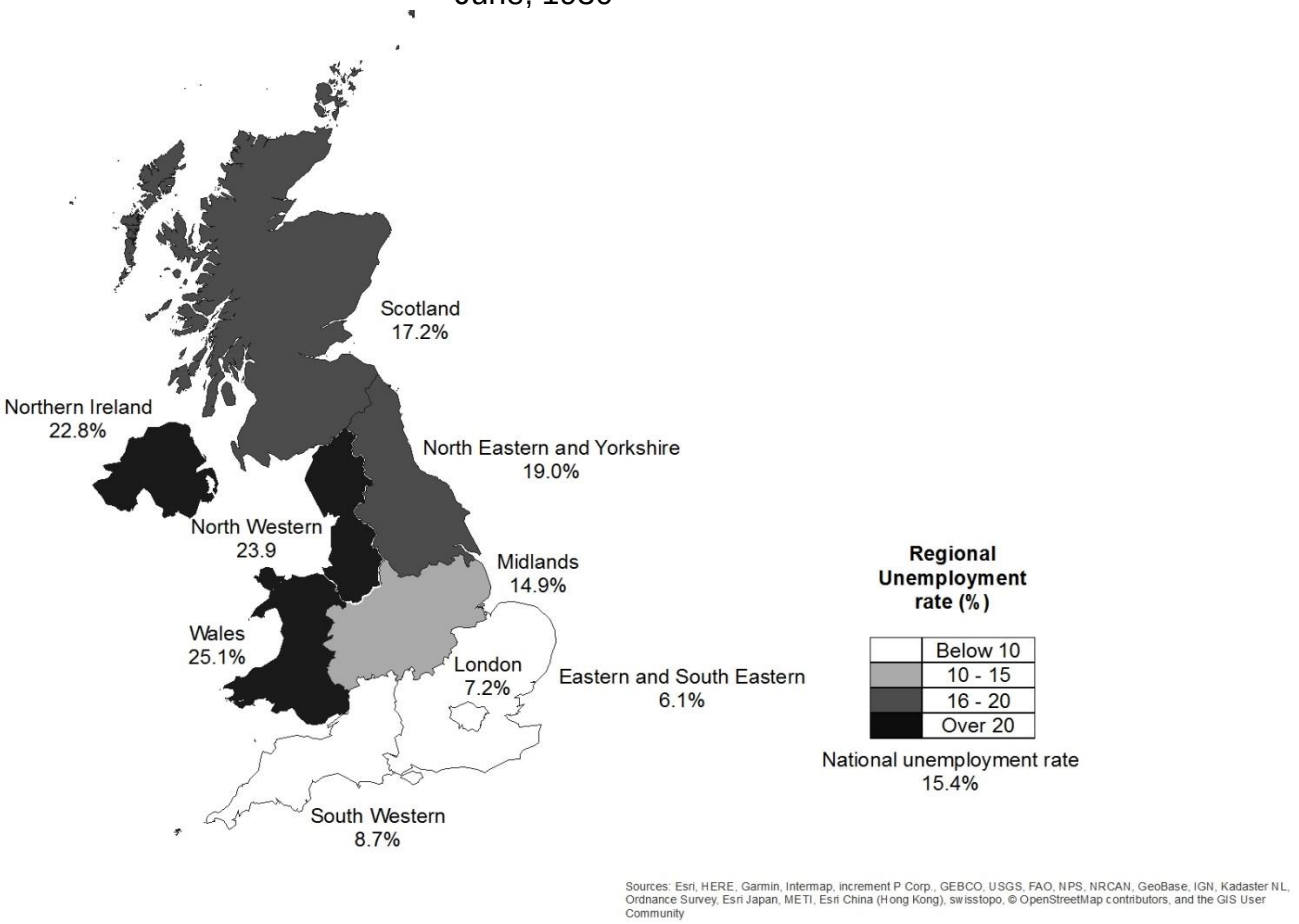
Figure 1
Unemployment rate by district (insured workers)
June, 1924



Sources: 20th Abstract of Labour Statistics

Figure 2
Unemployment rate by district (insured workers)
June, 1930



Sources: 20th Abstract of Labour Statistics

Table 1
Unemployment rate by industry (insured persons), July 1921-1933[a]

Industry	1921	1925	1928	1929	1932	1933
Building	15.4%	9.1%	11.7%	10.4%	30.6%	26.0%
Shipbuilding	32.8%	34.9%	28.3%	23.0%	63.8%	60.1%
Engineering, Ironfounding and metal trades	25.4%	13.7%	11.5%	9.8%	29.8%	23.4%
Construction of vehicles	11.7%	6.9%	9.7%	7.6%	22.7%	17.6%
Sawmilling	15.2%	8.2%	7.3%	7.0%	21.9%	18.3%
Chemicals	14.5%	8.1%	6.0%	5.9%	13.8%	12.2%
Hotel College, Club, etc,	11.8%	8.0%	5.9%	6.3%	14.6%	13.2%
Banking and Finance	4.1%	3.3%	2.2%	2.5%	5.5%	4.7%
Transport service	18.0%	15.0%	14.1%	13.0%	21.6%	20.3%
Mining	9.7%	14.3%	26.8%	17.5%	39.6%	36.8%
Printing and paper trades	9.8%	5.0%	4.1%	3.8%	10.3%	9.0%
Textile trades	13.4%	15.9%	14.3%	13.3%	29.5%	20.9%
Clothing	10.9%	9.0%	9.8%	7.3%	15.6%	13.1%
Food, Drink and Tobacco	9.5%	7.4%	6.8%	6.6%	12.3%	11.4%
Public utility services	8.3%	5.5%	5.7%	5.4%	10.9%	10.2%
Distributive trades	6.7%	5.8%	5.2%	5.4%	11.6%	11.3%
National and Local Governments	7.1%	7.3%	7.0%	7.3%	16.0%	16.9%
Others	15.7%	10.6%	9.1%	8.6%	19.5%	16.4%

Source: Calculated based in the information registered in the Labour Gazette (1921-1933)

a: Some years were omitted. However, for the classification between driver or brake, it was considered the whole 14 years. The completed table is available at the complementary material in the electronic version of this article.

Table 2
Matching function results

Dependent variable: The natural logarithm of Job-finding rate

	Model 1	Model 2	Model 3
The natural logarithm of market tightness	0.73***	0.52***	0.54***
	(0.08)	(0.06)	(0.07)
Female share of unemployed		-3.53***	-3.23*
		(0.77)	(1.67)
Juvenile share of unemployed		19.65***	18.73***
		(3.16)	(3.72)
The share of temporary stoppages		-1.13***	-0.98***
		(0.19)	(0.28)
The share of unemployed coming from textiles			-0.57
			(1.5)
The share of unemployed coming from mining			-0.43
			(0.61)
Constant	2.14***	1.03***	1.21**
	(0.33)	(0.37)	(0.51)
R^2	0.36	0.63	0.63
Observations	159	159	159

Notes: * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1* level. Standard errors are reported in parentheses.

Figure 3
Monthly deviations of average matching efficiency
April 1921 - June 1934

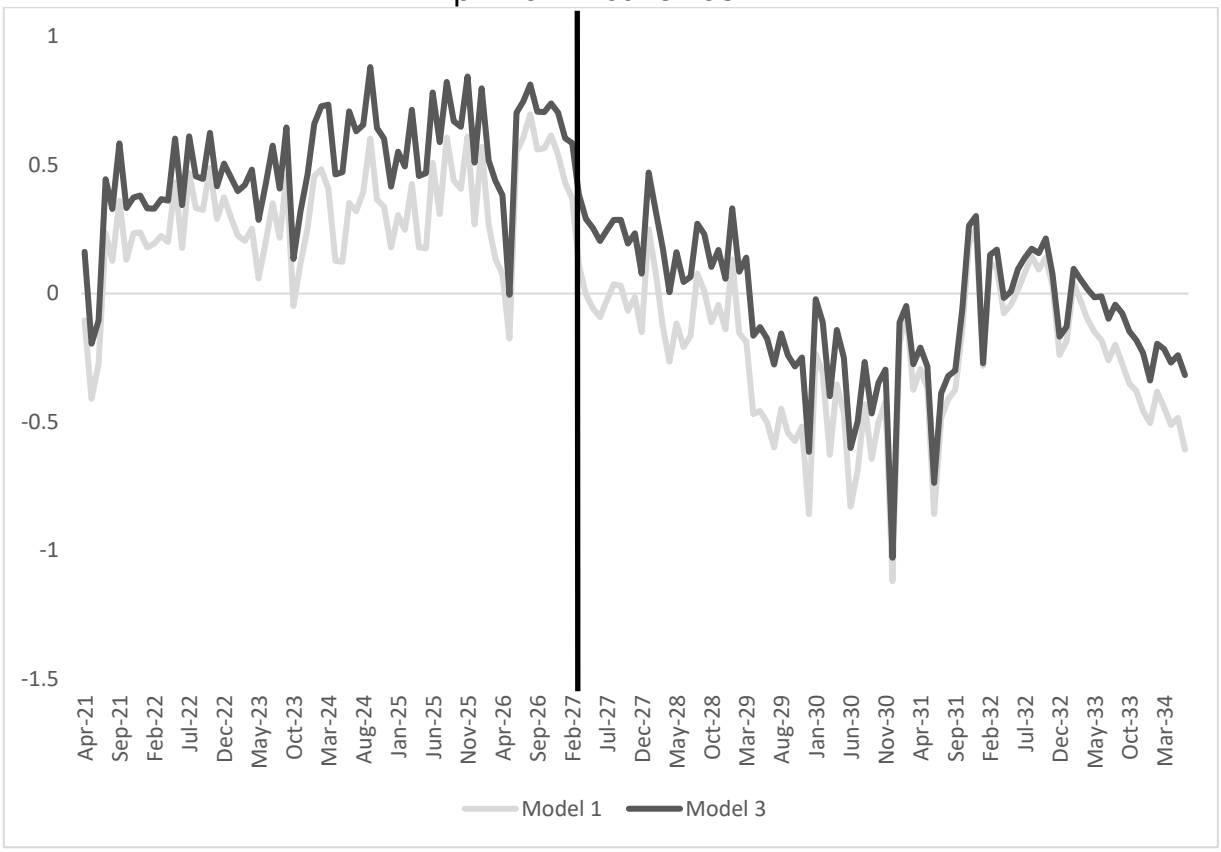


Table 3
Supremum Wald test for Structural break
at unknown date

Full sample:	April 1921 - June 1934
Trimmed sample:	April 1923 - July 1932
Estimated break date:	March 1927
Ho: No structural break	

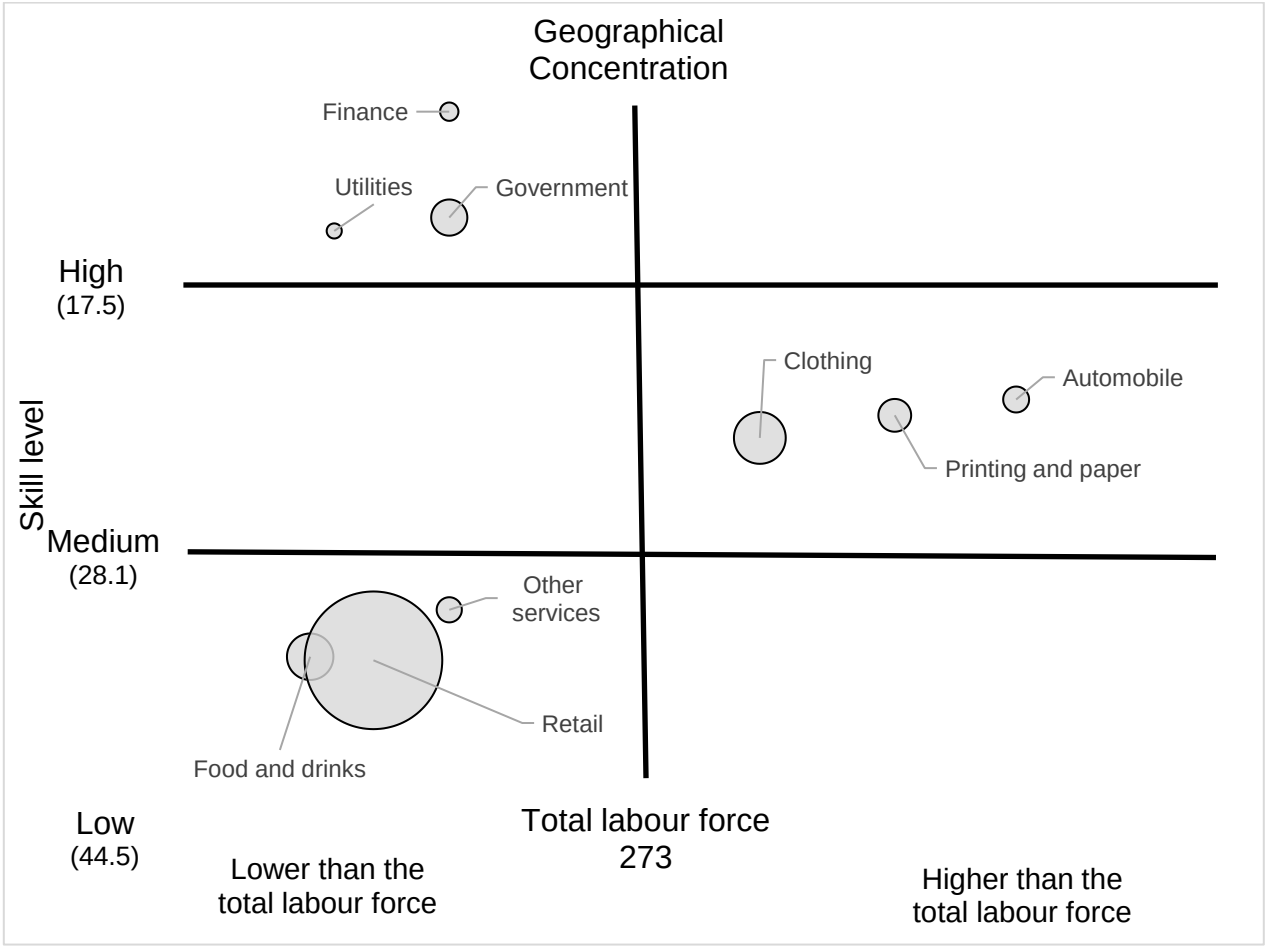
Test	Statistic	p-value
swald	250.4146	0

Exogenous variables:	The natural logarithm of market tightness, the female share of the unemployed, the juvenile share of the unemployed, the share of temporary stoppages, the share of unemployed coming from textiles, the share of unemployed coming from mining
Coefficients included in test:	The natural logarithm of market tightness, the female share of the unemployed, the juvenile share of the unemployed, the share of temporary stoppages, the share of unemployed coming from textiles, the share of unemployed coming from mining

Table 4
Influence of Skill and Geographical dispersion on the segments' dispersion

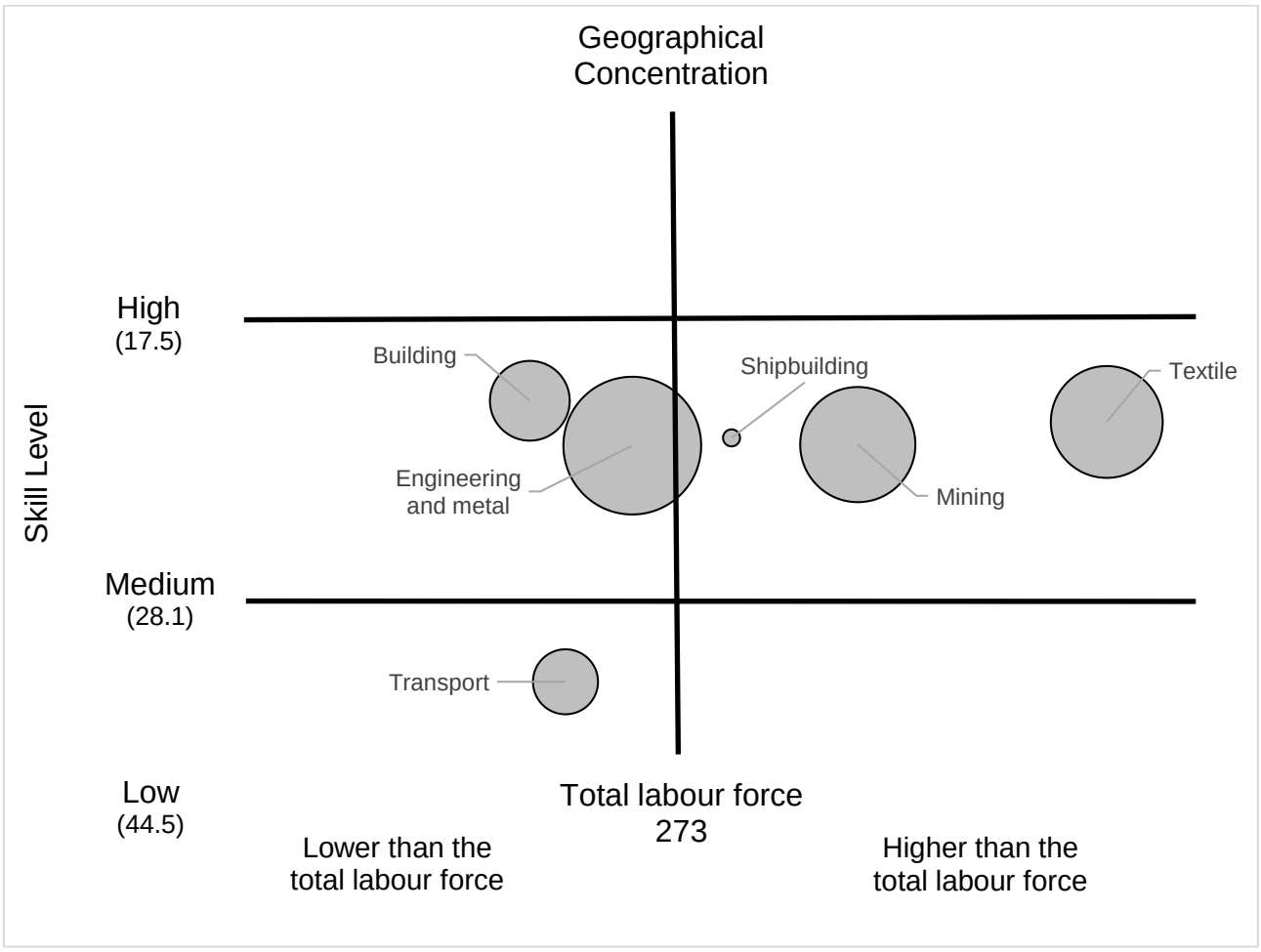
		Geographical concentration	
		Low	**High**
Skill Level	**High**	Increase	Increase
	Medium	Reduce	Increase
	Low	Reduce	Increase

Figure 4
Drivers classification according to
Influence of Skill[a] and Geographical[b] dispersion on matching efficiency



Notes: a) The numbers on the vertical axis between parentheses are the share of each skill class for the total labour force.
b) The number in the middle on the horizontal axis in the variance for the total labour force.
Source: Information for Skill classification is from Routh, G. (1980). Information for geographical concentration classification is from Labour Gazette January 1927.

Figure 5
Brakes classification according to
Influence of Skill[a] and Geographical[b] dispersion on matching efficiency



Notes: a) The numbers on the vertical axis between parentheses are the share of each skill class for the total labour force.
b) The number in the middle on the horizontal axis in the variance for the total labour force.
Source: Information for Skill classification is from Routh, G. (1980). Information for geographical concentration classification is from Labour Gazette January 1927.

Table 5
Matching function results with interactions before and after structural break

Dependent variable: The natural logarithm of Job-finding rate

	Model 4	Model 5
The natural logarithm of market tightness	0.59***	0.47***
	(0.05)	(0.04)
The female share of the unemployed	-1.25	-2.66*
	(1.05)	(1.09)
The juveniles share of the unemployed	8.23***	8.50***
	(2.79)	(2.36)
The share of temporary stoppages	0.48*	0.34**
	(0.23)	(0.18)
The share of unemployed coming from textiles	-2.72*	-2.05*
	(1.15)	(0.99)
The share of unemployed coming from the two major depressed trades*dummy after structural break (June 1926)	-1.90***	
	(0.18)	
The share of insured workers coming from distributive trades*dummy before structural break (June 1926)		5.36***
		(0.38)
Constant	1.84***	0.99***
	(0.31)	(0.26)
R2	0.79	0.84
Observations	159	159

Notes: * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1* level. Standard errors are reported in parentheses.

[i] Some sectors, such as agriculture or domestic service, were excluded because they were not considered sensitive to the business-cycle fluctuations.

[ii] Unemployment benefits were increased early in 1931, but in October they were reduced by 10% due to the worsening economic situation. This measure was reverted in 1934 due to improved economic activity, followed by further increases in 1935 and 1938.

[iii] As the econometric results show, it was in these years with the highest trade union membership that matching efficiency shows a better performance

[iv] In terms of insured workers

[v] The ratio of weekly unemployment benefits to weekly wages

[vi] The rate at what workers leave their jobs

[vii] A model excluding these years yields similar results.