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Why Was Unemployment so Low in Postwar Sweden?

An Analysis with New Unemployment Data by Manufacturing Industry, 1935-1948

Jakob Molinder[♠]

Abstract

Sweden is often cited as one of the starkest examples of a country where corporatist policy structures and centralized wage bargaining produced remarkable economic and social outcomes in the postwar golden years. Not surprisingly, previous explanations for Sweden's full employment period have emphasized this set of labor market institutions which was in place from the 1950s. Alternatively, temporary demand-factors in connection with the Second World War have been stressed as a cause. In this paper, I examine the development of unemployment in Sweden in the 1930s and 1940s and establish two facts: i) unemployment fell continuously from the mid-1930s until immediately after the end of the Second World War, resulting in the low levels of unemployment that would characterize the postwar period, and ii) inflation did not spiral as a result, suggesting restraint in wages over the same period. The fact that unemployment fell before the establishment of Sweden's postwar labor market institutions suggest that they were not the cause for the full employment economy. The absence of escalating inflation likewise rules out temporary demand-factors such as Keynesian economic stimulus and military conscription. The failure of these factors to explain the change suggests instead that exogenous forces shifted the relationship between wages and unemployment during this period, lining up with similar observations for the UK. The results have implications for the literature on the determinants of unemployment, indicating that neither corporatist institutions nor expansionary fiscal policy played a role in shift to full employment in Sweden - one of the marking examples of postwar economic success.

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JEL-codes: N34, N14, N64, J64, E24

1. Introduction

Before the great depression hit Sweden in 1930 unemployment was, according to union reports, already above 10 percent. Once the crisis hit joblessness rose even further, peaking at 23 percent in 1933. Contemporary observers had all reason to be pessimistic. Against this background, it is especially puzzling that the Swedish economy just a decade later would be characterized by full employment and labor shortages. The change was so fast that by the end of the Second World War, Sweden had already reached the low level of unemployment characteristic of the postwar period, and until the 1990s, it would never at any point rise above four percent.

The type of labor market institutions that characterized Sweden in the 1950s and 1960s, including centralized bargaining over wages and corporatist policy structures, has often been cited as a cause for the low level of unemployment during the postwar golden years. By the time these institutions were in place in the 1950s, however, full employment had already been established. Keynesian demand management and the effect of falling labor supply during the war caused by military conscription, has also been suggested as an alternative explanation. These factors, however, fails to explain why the shift took place without significant upward pressure on prices.

By creating new measures of unemployment for seven subsectors in manufacturing between 1935 and 1948, I show that unemployment was falling continuously over the period and that it was a widespread phenomenon, shared across industries. The focus on industries within manufacturing allows me to link the unemployment figures to data on production and wages. To analyze whether the change in unemployment reflected a shift in equilibrium, I examine if wage restraint was present. I do this in two complementary ways. The first is to follow Blanchard (1997) and compare the growth of the scope for wage increases, operationalized as the rate of Harrod-neutral technological progress, to the development of real product wages. The second is, following Broadberry (1986), to plot unemployment against nominal wage increases. Both approaches suggest that the fall in unemployment was compatible with stable prices. The fact that unemployment fell before the establishment of Sweden's celebrated postwar labor market institutions suggests that they were not the cause for the full employment economy. The shift in equilibrium likewise rules out temporary demand-factors. The failure of these standard explanations to account for the change suggests that exogenous forces shifted the relationship between wages and unemployment during this period, similar to what Hatton and Boyer (2005) have found for the UK case. They conclude

that: "[T]he key difference between the golden age and the periods before and after was *shifts* in labour demand that are not accounted for by other variables that are usually thought to determine the equilibrium unemployment rate (Hatton and Boyer, 2005, p, 35)". The same seem to have been true for Sweden.

The results have implications for research on the determinants of unemployment. In standard textbook models of the labor market, factors such as social safety nets, union coverage, and tax wedges are seen to be detrimental to full employment (Layard, Nickel and Jackman, 1991). These models would predict increasing rather than falling unemployment in Sweden during this period. While centralized labor market institutions such as national bargaining over wages and union involvement in corporatist policy structures are sometimes seen as being able to offset the detrimental effect of other institutions such as strong unions and high taxes, these possibly countervailing forces were not applicable during the time that Sweden reached full employment since these institutions only appeared later. In one of the most emblematic cases of successful outcomes on the labor market, neither expansionary fiscal policies nor corporatist institutions played a role in the shift to full employment.

The rest of the paper proceeds in the following way. In the next section, I discuss previous explanations for Sweden's low postwar unemployment, followed by section 3 where I present the trajectory of unemployment from existing data and present the construction of my new series for seven manufacturing industries. I then proceed by examining whether the fall in unemployment was concurrent with stable prices and wages. The method is explained in Section 5 and the results are presented in Section 6. Section 7 offers conclusions.

2. Previous Explanations of Low Postwar Unemployment

Political economy models often associate centralized industrial relations in the form of encompassing unions organization, centralized wage bargaining, and corporatist policymaking with positive economic outcomes such as high economic growth and low unemployment. In Mancur Olson's famous model, when interest organizations are large enough, they will incorporate general welfare effects in their decision-making process. This consideration, in turn, leads them to reduce their claims on the economic pie for the greater good of society (Olson, 1982). Calmfors and Driffill (1988) applied this idea to the context of unemployment and wage bargaining and showed that highly centralized wage negotiations were associated with better unemployment outcomes than intermediate centralization. From this line of reasoning it is easy to see why the institutions of the Swedish model in the 1950s

and 1960s (encompassing union organizations, centralized wage bargaining and corporatist negotiations between peak organizations and the government) would be a reason for the low level of unemployment in the golden years. Such reasoning is central to Barry Eichengreen's explanation for impressive postwar economic outcomes in corporatist Western European countries. The interwar period, Eichengreen argues, was characterized by industrial strife and wage increases that added to inflation and reduced economic growth. During the postwar period, in contrast, compromises between unions, employers and the state encouraged workers to hold back on excessive wage demands in favor of increased investments and social spending (Eichengreen 1994; 2008; Eichengreen and Iversen 1999; Eichengreen and Vazquez 1999). [1] Three characteristics were of particular importance: centralized bargaining, government commitment to full employment, and egalitarian wage and social policies. According to Eichengreen and Iversen (1999), Sweden: "came closest to the ideal type" (p. 126).

This account is not without its critiques, however. Erik Bengtsson has pushed back on the notion that wage restraint characterized the postwar period. He shows that for the Scandinavian countries (Bengtsson 2015), and in the case of Sweden specifically (Bengtsson, 2014), that the 1950s and 1960s, to the contrary, were characterized by wage militancy. [2]

A look at the Swedish unemployment data also shows why this focus on the postwar period is misdirected. Joblessness had been widespread during the 1920s, even as the economy improved in the latter half of the decade. When the depression hit in 1930, unemployment rose further and was above 23 percent at the peak of the crisis in 1933. Only a decade and a half later, unemployment was already below 3 percent and inflation was not rampant, suggesting that this was not a temporary state; a shift in the equilibrium rate had taken place. In the late 1940s, however, none of the institutions central to the debate about postwar corporatism, such as centralized bargaining, politics for full employment or encompassing social safety nets, were yet in place. Consequently, something else must be the reason why unemployment became so low.

One obvious candidate to explain the shift to full employment is the "Keynesian revolution" and the introduction of expansionary economic policies in the 1930s and beyond. An obvious problem with this argument is the fact that inflation did not increase markedly at

[1] Similar reasoning is present in the interpretation by Stephen Broadberry and Nicholas Crafts of the postwar social contract in the UK (Broadberry & Crafts, 1996; Broadberry, 1994).
[2] Similar critique has been presented for the UK case by Hatton and Boyer (2005) and Hatton, (2007) and for Sweden by Svanlund (2009).

the time, which would have been the case if increased demand was the cause of falling unemployment. The question, is then, as Hatton and Boyer (2005) put it: “why a high level of aggregate demand was not quickly translated into price and wage inflation that ultimately restored the level of unemployment to its pre-existing equilibrium level (p. 40).” The Keynesian argument deserves some consideration, however. Swedish economists were in fact early in developing theories on the positive impact of fiscal stimulus and the Social Democratic government, in power from 1932, was sympathetic to such policies. In spite of this, however, economic policy was not expansionary in the 1930s. To the contrary, the government ran a budget surplus throughout the decade. For this reason, there is little to suggest that fiscal stimulus played any significant role in the recovery (see for example Jonung, 2017). As a consequence of the Second World War, however, expenditures rose above government income during the extent of the conflict. This was only temporary, however, and public debt was consolidated during the late 1940s and early 1950s (Fregert and Gustafsson, 2014). The fact that unemployment fell both in the 1930s as well as after the war, at times when fiscal policies were not expansionary, casts doubt on the Keynesian revolution as the cause.

A related argument ties falling unemployment during the Second World War to the shortage of labor as men were called into the army (Silenstam, 1970; Lundh, 2010). While according to this argument unemployment declined as a consequence of reduced supply rather than increased demand, the idea can be put to the same type of critique that was directed by Hatton and Boyer against the Keynesian argument in the quote above. In addition, this explanation cannot account for the fact that unemployment remained low even after conscription was discontinued at the end of the war. It could, nonetheless, possibly account for why unemployment fell so rapidly during certain periods of the war. This argument has been conclusively refuted in an analysis by Johansson (1985) however. He relates the monthly number of conscripted men to the change in unemployment during the same period. It is evident from his results that no association exists whatsoever. To the contrary, the level of conscription was highest at the beginning of the war, when unemployment was higher, while more and more men returned to the regular labor market towards the end of the conflict at the time when unemployment was falling most rapidly. Thus, the decline om unemployment coincided with an increasing rather than falling supply of labor.

As the literature review demonstrates, previous explanations for full employment in postwar Sweden has focused either on institutions of the 1950s and 1960s, which cannot explain why unemployment fell without inflation during the 1930s and 1940s, or on

temporary increases in demand, which are not able to account for why the fall in unemployment was permanent, compatible with stable inflation and not ultimately restored after the war. In the next section, I present new evidence on unemployment during the period when unemployment was falling rapidly. This will allow me to examine if the fall in unemployment was generally shared across the economy and whether the shift was concurrent with stable prices and wages.

3. Background and New Evidence on Unemployment by Manufacturing Sector 1935–1948

In this section I begin by presenting the aggregate pattern of unemployment that appears from the available series provided by the unions and the public unemployment insurance for the period prior to the 1960s. However, these data are subject to compositional effects as the number of unions reporting unemployment and participating in the public unemployment insurance statistics increased over time. To examine if the fall in unemployment was a general shift or if it was driven by compositional changes, I then follow up by zooming in on the period between 1935 and 1948 when unemployment was falling most rapidly and when the disaggregated union reports allows me to construct individual series for each manufacturing industry. The focus on manufacturing subsectors will also allow me to relate unemployment to data on productivity and wages.

Aggregate Unemployment

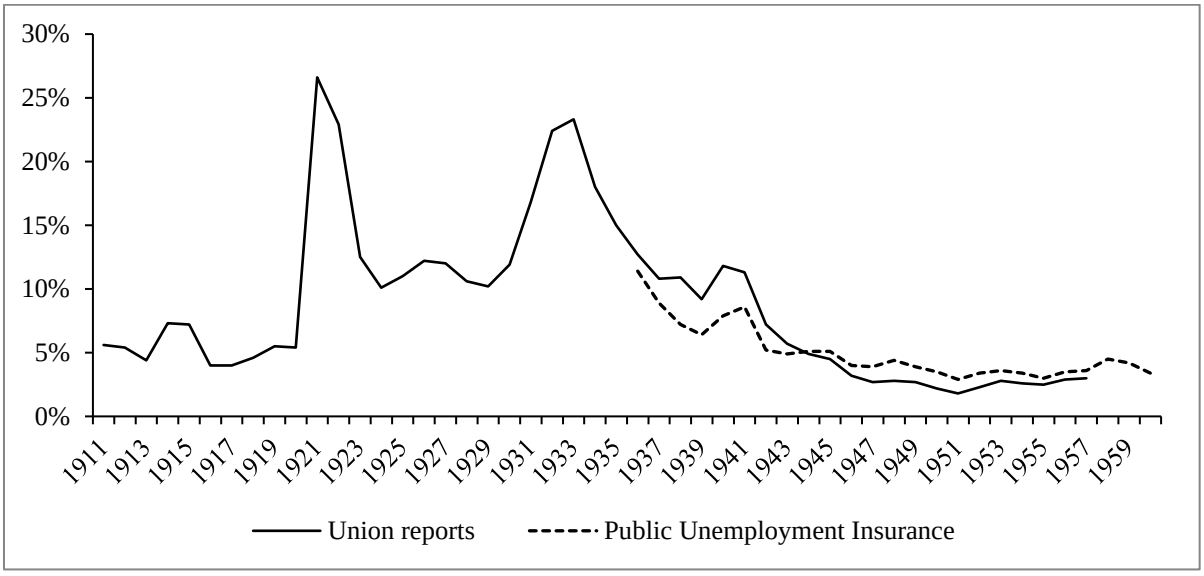
Figure 1 shows the available figures for total unemployment in Sweden between 1911 to 1960. For most of the interwar period, the available numbers are those reported by the unions. From 1936 onwards the public unemployment insurance scheme provides complementary information on the number of unemployed. The insurance data has a higher coverage of non-manufacturing workers and this is likely the reason why unemployment according to this series is lower in the late 1930s and somewhat higher in the postwar period than the union figures. Yet, overall, the figures from the public unemployment insurance conform well with the union figures and the basic pattern is the same.

According to these data, there was a substantial increase in unemployment during the economic crisis of the early 1920s. As the economy improved in the latter half of the decade, joblessness remained widespread and never fell below ten percent before the 1930s. Once the

Great Depression hit, unemployment rose further and reached a peak in 1933 at 23 percent. However, this time the experience of the 1920s was not replicated. In the latter half of the 1930s, unemployment began to decrease, and with the exception of the early years of the Second World War, it continued to abate. By the end of the 1940s, unemployment had reached the low level associated with the postwar golden age.

An alternative indicator of labor market slack is the number of job applications per available vacancy. This data is available from the public labor exchange office and suggests a similar picture. The number of job applications per vacancy fell from a peak of 6.2 in 1933 down to 1 by 1946. The lowest level ever reached in the 1920s was 1.5 applications per vacancy.

Figure 1: *Unemployment in Sweden According to Available Sources, 1911–1960*



Source: Authors' calculation from union reports and information from the public unemployment insurance published in Social Messages (*Sociala meddelanden*).

To get a clearer sense of the shift starting in the second half of the 1930s, I will now continue by using the disaggregated union reports to create new unemployment series for seven manufacturing industries. This allows me to avoid any compositional effects that affects the aggregate data. Importantly, disaggregating by manufacturing industries also allows me to compare the unemployment figures to data on production, prices and wages at the same level of disaggregation.

Unemployment by Manufacturing Industry

In presenting new unemployment data for seven sectors in manufacturing I begin in 1935 as this is the first year when the configuration of reporting unions allow me to disaggregate them by industry without the risk of sectoral overlap.[3] The reason for ending in 1948 is likewise the change in reporting that took place after that year.[4] The source for the new unemployment series is the reports sent in by the unions, and for this reason, it is worthwhile to give some background on the production of these reports.

When a significant number of employees in the manufacturing industry became organized in unions, the interest increased for the type of statistics that the unions themselves were keeping on unemployment among their members. The reason why the local unions collected this type of information was that individual members were exempted from paying the weekly union fee if he or she was without a job during the period. After a public unemployment census was conducted in 1909, the authorities noted that the union figures could be used as a reasonable proxy for economy wide unemployment. It was decided that a systematic and continues collection and publication of these statistics should begin under the auspices of The National Board of Trade (*Kommerskollegium*). The collection of the union reports took place in the following way. First, a form was sent out to the local union branches, which at the end of each month sent it to the central union office together with other internal information. The central unions then forwarded the information to The National Board of Trade. The staff at the central union office frequently reviewed the local reports in an effort to make them as comparable as possible. For each local branch, the monthly reports included information on the number of members, the number of unemployed on the last day the month and the total number of weeks of joblessness. The local reports were aggregated for each national union by The National Board of Trade. The job of collecting the union reports was later overtaken by Swedish National Board of Health and Welfare (*Socialstyrelsen*) and published in the monthly publication Social Messages (*Sociala meddelanden*).

To arrive at sectoral unemployment rates, the reporting unions are allocated to the sectors in which their members were active. The division into subsectors within manufacturing follows the classification in the official statistics, and for this reason, the unemployment figures will correspond to the sectors available in the statistics on

[3] Most importantly, 1935 is the first year when the different worker categories within the Manual Workers Union were presented separately.

[4] In 1949, the new Building Workers Union was founded which drew members who had previously belonged to other unions.

employment, output and capital stocks. After this portioning of unions to sectors, the number of members is compared to the number of employed in each manufacturing subsector to assess the representativeness of the union figures. The central trade union organization, LO, encouraged its affiliate unions to organize according to the industry where their members were employed rather than along occupational divides. By the time of this investigation, this process was almost complete and for this reason, it is relatively straightforward to allocate individual unions to their sector. The apportioning of unions to manufacturing subsectors are detailed in Table 1.

The data from the unions come in two forms. In the typical case, reports are given for the union as a whole. However, in the case of The Metal Workers Union (*Metallindsutriarbetareförbundet*), where membership encompassed workers in both metal manufacturing and the engineering industry, as well as in the case of The Manual Workers Union (*Grovarbetareförbundet*), where members could be employed in diverse sectors, the reports are also split into different categories. In the case of the Metal Workers Union, the reports are given for metal manufacturing and engineering industry workers respectively. For the Manual Workers Union, three categories are present: workers employed in the building material industry, on glassworks, and in sugar factories. In the case of members in the metal manufacturing and engineering industry, they are in both cases allocated to the mining and metal industry. Workers in the building material industry and on glassworks are proportioned to quarrying while sugar factory workers are allocated to the food industry.

Table 1: *Allocation of Unions and Worker Categories to Manufacturing Industries*

Subsector	*Union*	*Worker Category*
1. Mining and metal	Mining Workers Union, Foundry Workers Union	(M) Iron foundry workers, (M) Engineering workers
2. Quarrying	Stone Workers Union	(Man) Building material industry workers, (Man) Glass factory workers
3. Wood products	Sawmill Workers Union, Wood Products Industry Workers Union	
4. Pulp and paper	Bookbinders Union, Lithographers Union, Typographers Union, Paper Industry Workers Union	
5. Food products	Brewery Workers Union, Food Products Industry Workers Union, Tobacco Workers Union	(Man) Sugar mill workers
6. Textile and clothing	Clothing Industry Workers Union, Textile Workers Union	
7. Leather, hair and rubber	Shoe- and Leather Industry Workers Union	

Note: **(**M) Denotes worker category in the Metal Workers Union. (Man) Denotes worker category in the Manual Workers Union.

A comparison of union membership to total employment from the manufacturing census gives an indication of the representativeness of the union figures for each industry. This comparison is provided in Figure 2. Representativeness is relatively high in all cases, on average about 80 percent of all workers employed were also members of a union that reported unemployment figures. The two exceptions are quarrying as well as the leather, hair and rubber industries were the coverage rate is lower, about 50 and 40 percent respectively. This can be problematic if the workers that are not represented in the union figures differ significantly from those who appear in the data. This caveat must be kept in mind when interpreting movements in the rate. Yet, taken together, coverage must be considered good. The representativeness likely reflects the comparatively high level of union organization the Swedish union movement had achieved by this time, especially in the manufacturing industry (Kjellberg, 1983, Donado and Wälde, 2012).

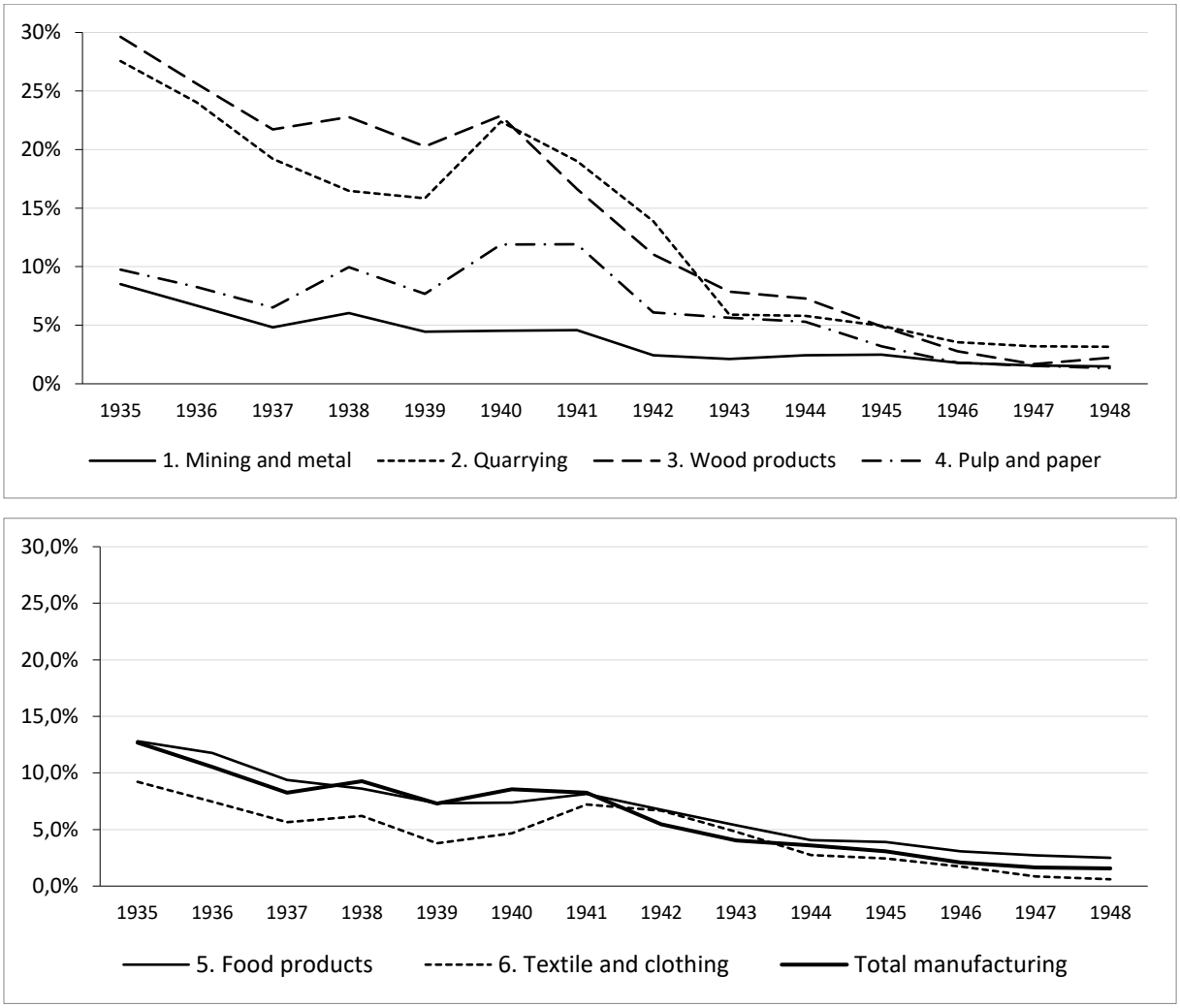
Figure 2: *Coverage of the Union Data for Each Manufacturing Subsector, Average over the 1935 to 1948 Period.*

Note: Membership in unions reporting unemployment among members.
Source: Union membership from Social Messages (*Sociala meddelanden)* and employment from Manufacturing statistics (*SOS industri*).

Figure 3 shows the resulting unemployment series after the individual unions have been allocated to their corresponding manufacturing subsector. The chart provides the yearly unemployment rate in each industry from 1935 to 1948.

The significant decline in unemployment during these years is clearly evident from the figure and is broadly shared across industries. The conformity of the figures suggests that the decline in unemployment was indeed a general phenomenon and was not restricted to certain economic activities. There is some nuance in the details of this process for the different sectors, however.

Figure 3: *Unemployment by Manufacturing Industry 1935-1948.*



Source: The authors' calculation from union reports published in Social Messages (*Sociala meddelanden).*

The most dramatic change over the period took place in the wood and the quarrying industries, where unemployment was well above 20 percent around 1935. All industries except pulp and paper also experienced its highest level of unemployment during that year. In the case of pulp and paper, there was a significant disruption at the onset of the Second World War which led to a new peak in unemployment, but otherwise the general pattern over the period is similar to the other industries. In addition to pulp and paper, a significant shock to employment occurred at the start of the Second World War in quarrying, textiles and clothing as well as in the leather, hair and rubber industries. This reflects the susceptibility of these sectors to the disruption of international markets that took place in the beginning of the conflict. Yet despite these deviations, for no industry did it stop the long-term pattern of falling unemployment.

To consider the general trend in more detail, Figure 3 also includes the unemployment rate for manufacturing as a whole. Since this series includes the same unions throughout the whole period, it is not affected by compositional changes that inflected the aggregate series shown in Figure 1. From this data, the general fall in unemployment over the period is clearly shown. In 1935, unemployment was above 10 percent. It then fell until the beginning of the Second World War. After a short disturbance, unemployment then proceeded to fall throughout the war years and continued to decline also after the conflict had ended. There was no apparent disruption associated with the transition of the economy back to peace-time conditions. By 1946, unemployment in the manufacturing industry had fallen below 2 percent. In the most extreme cases of the textile and clothing and the leather, hair and rubber industries, unemployment had even dropped below 1 percent.

So far, I have established that unemployment fell across all manufacturing industries throughout the period from 1935 to 1948. This was a dramatic shift given that unemployment in the 1920s never fell below 10 percent even at the business cycle peak. It remains to establish what the causes were for this change in the level of unemployment. This is what I turn to in the next section.

4. Unemployment, Warranted Wages and Wage Inflation

In this section, I discuss the New-Keynesian framework I use to examine movements in unemployment. Drawing on this theory and previous literature, I present two approaches to empirically investigate shifts in the equilibrium, i.e., the rate of joblessness compatible with stable prices. The first approach links employment growth to real-wage increases and technological progress. The second approach considers the joint movement of resource utilization and inflation. The two methods complement each other as the first allows for a detailed examination of the growth in the scope for wage increases in relation to labor costs, while the second approach permits me to identify during which periods the shift in equilibrium took place and whether there were common time patterns across industries.

Real and Warranted Wages

In a string of publications, Olivier Blanchard has developed the idea of the "Warranted wage" He argues that equilibrium unemployment is determined by the rate of growth of real wages relative to the room for wage increases given by the warranted wage. The warranted wage, in turn, is determined by the rate of Harrod-neutral technological progress which can be derived

from a simple growth model of the Sollow-kind and that fits two basic observations: i) that wages tend to grow at the rate of technological progress and ii) that the capital stock per worker expands at a similar pace. Harrod-neutral technological change is consistent with these stylized facts and implies that technological progress is labor-saving. This contrasts to Hicks-neutral technical change, where the efficiency of all factors increases equally (Blanchard, 1997; Blanchard and Wolfers, 2000). The conclusion from Blanchard's model is straightforward: long-run unemployment remains stable if real wages grow at the same rate as the warranted wage. Correspondingly, for unemployment to fall, wages have to grow at a slower pace than is given by the room for wage increases. A simple hypothesis can be derived from Blanchard's model:

Hypothesis 1: Unemployment will decline if the growth of wage costs fall below the increase in the warranted wage

To operationalize this hypothesis, two variables in addition to the unemployment rate needs to be computed: i) the level of wage costs relevant to employers, i.e., the real product wage (nominal wages deflated by producer prices), and ii) the warranted wage, derived from a calculation of total factor productivity. While calculating real product wages is straightforward, the computation of the warranted wage is explained next.

The starting point for calculating the warranted wage is a simple growth accounting framework based on a Cobb-Douglas production function. In the Cobb-Douglas case, the level of output is determined by total factor productivity, the capital stock, and employment in the following way:

(1)

$$Y_t = TFP_t * {K_t}^{\alpha} * {L_t}^{1-\alpha},$$

where Y_t is output at time t, $K_t$is the value of the capital stock, $L_t$is the amount of labor and TFP_t technology, or total factor productivity. The coefficients α and $(1-\alpha)$ denote how much production will increase if the amount of capital or labor is raised. Since the two coefficients sum to one, it implies that if the amount of labor and capital is doubled, so is production. As a consequence of this assumption it is likewise possible to show that the value

of α and ($1-\alpha$) will equal the capital share (profits and interest) and labor share (wages and social benefits) of total income respectively.[5]

In the Cobb-Douglas model, α and ($1-\alpha$) will equal the respective share of profits and wages in national income. To calculate the growth of output, equation 1 can be restated in the following way:

(2)

$$\widehat{Y_t} = \widehat{TFP_t} + \alpha\widehat{K_t} + (1-\alpha)\widehat{L_t},$$

where $\widehat{Y_t}$ describes the rate of growth of value added, $\widehat{K_t}$ the growth of the capital stock, $\widehat{L_t}$ the increase in employment and where α is the capital share and $(1-\alpha)$ the labor share. From this equation, it is possible to derive the rate of technological progress if we know the growth of output, capital, and labor. To derive TFP growth the equation is rearranged in the following way:

(3)

$$\widehat{TFP} = \widehat{Y} - \alpha\widehat{K} - (1-\alpha)\hat{L}$$

The warranted wage is defined by Blanchard as the rate of Harrod-neutral technological change. Following Blanchard, I will operationalize the warranted was the growth of TFP divided by the labor share as in the following equation:

(4)

$$Growth\ of\ the\ warranted\ wage = \widehat{TFP_t}/\beta$$

[5] With a production function of the Cobb-Douglas type with constant returns to scale it is possible to show that the share of value added of the factors of production will equal the value of the parameters α and $(1-\alpha)$ respectively. The share of capital is equal to: $\frac{r*K}{Y}$ where r is the interest rate, K the amount of capital and Y is GDP. With perfect competition, the interest rate will equal the marginal return to capital, which in the Cobb-Douglas function is $\frac{dY}{dK} = \alpha AK^{\alpha-1}L^{1-\alpha}$. From this follows that the share of capital will be: $\frac{\alpha AK^{\alpha-1}L^{1-\alpha}*K}{AK^{\alpha}L^{1-\alpha}} = \alpha$ (See Weil (2009) p. 200-201).

To calculate total factor productivity, I use information on nominal value added, value-added deflators, hours worked, the number of employed, and the amount of horsepower used, all by manufacturing subsector. Schön (1988) is the source for the deflators and the statistics on value-added. The remaining data is gathered from the official industrial statistics (*SOS Industri*) published on a yearly basis. The parameters α and (1-α) used for the growth accounting is taken from Åberg (1969). In the Cobb-Douglas model, these parameters signify the share of value added that falls in the hand of labor and capital respectively. Data on wages is taken from official wage statistics (*SOS Löner*).

Resource Utilization and Wage Inflation

Stephen Broadberry has introduced a method for distinguishing between movements in unemployment that are driven by shocks to demand and supply. The process is straightforward: If declining unemployment is accompanied by a rise in wage inflation, the observed shift is the result of a change in demand. If unemployment instead falls without any such increase in growth of wages, there has been a shift in the supply curve (Broadberry, 1986). From Broadberry's framework, the following hypothesis can be derived:

Hypothesis 2: If falling unemployment is the consequence of a shift in the supply curve, nominal wages should be stable or decreasing.

To make it easier to inspect the co-movement of unemployment and wages visually, Broadberry suggests the following reformulation of the rate of unemployment:

$$Resource\ utilization = (100 - U)$$

The closer resource utilization comes to the value 100, the lower the unemployment. In the empirical analysis, in addition to the new unemployment series by manufacturing sector, I will make use of information on nominal wages for the same industries drawn from the official wage statistics (*SOS Löner*).

5. Results: Examining Falling Unemployment

In this section, I use the methods outlined above to test for the causes of declining unemployment between 1935 and 1948. Was the new full employment economy really compatible with stable wages and prices and was the growth of wages restrained? I begin by comparing warranted to real product wages and continue by relating unemployment to wage inflation to determine if there were indeed a shift in equilibrium unemployment.

Hypothesis 1: Warranted and Real Product Wages

Table 2 shows the result from the growth accounting exercise for the seven manufacturing industries and for the manufacturing sector as a whole. The first three columns present the growth in each sector of value added, horse power and employment respectively, while the fourth and fifth shows the resulting calculation of the change to total factor productivity and warranted wages.

Table 2: *Results from Growth Accounting, 1935-1950*

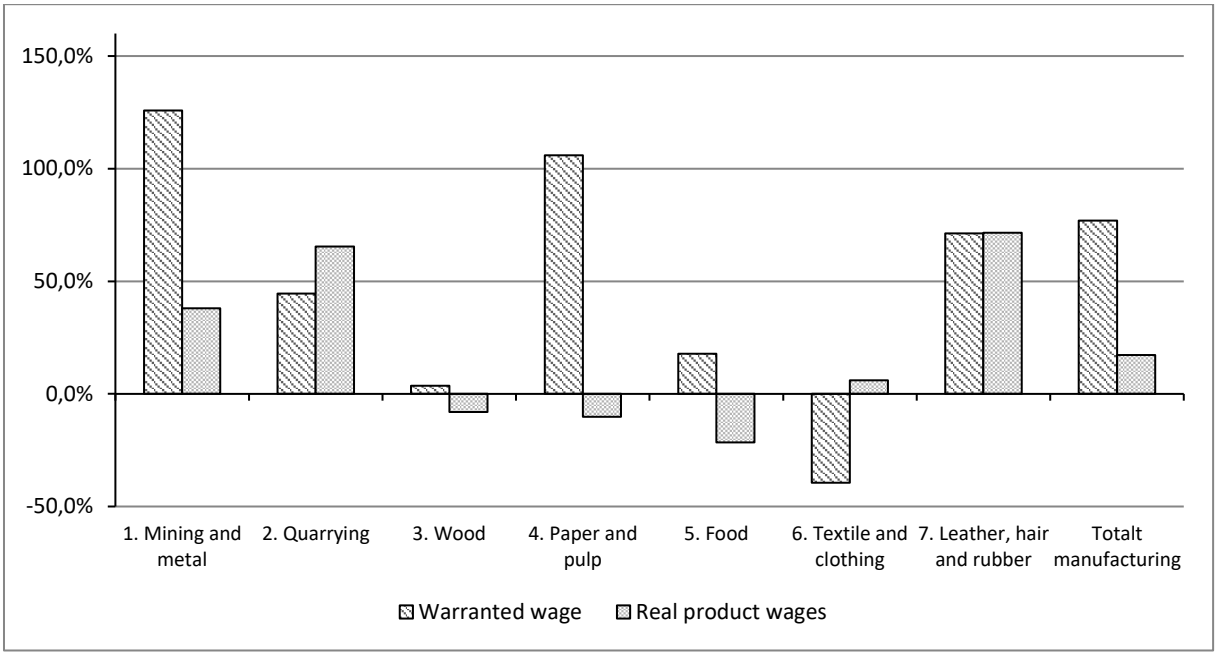
Growth of:	*Value added*	*Horse power*	*Employment*	*TFP*	***Warranted wage***
1. Mining and metal	148 %	101 %	82 %	59 %	126 %
2. Quarrying	95 %	167 %	-7 %	29 %	45 %
3. Wood	43 %	76 %	22 %	2 %	4 %
4. Paper and pulp	61 %	18 %	22 %	41 %	106 %
5. Food	46 %	47 %	29 %	6 %	18 %
6. Textile and clothing	27 %	84 %	26 %	-22 %	-40 %
7. Leather	113 %	167 %	31 %	49 %	71 %
Total manufacturing	89 %	65 %	37 %	41 %	77 %

As evident from the table, there are large differences across sectors. The growth of the warranted wage varies from a 150 percent increase in mining and metal to a decline by 41 percent in the food industry. The pattern of warranted wage growth, in turn depending on the growth of TFP, is mainly related to the diverging experience of growth in value added. In the three sectors with the most disappointing development: the wood, food and especially textile and clothing industries, value added grew by less than 50 percent over the period.

Some reservations should be made about these figures, however, as the lackluster development for some sectors, in particular for textile and clothing, could be in part explained by temporary business cycle developments. Some issues with statistical measurement are also likely to exist especially for the smaller sectors, so the most emphasis should be placed on the development for manufacturing as a whole. For the whole sector, the warranted wage grew by 77 percent over the period.

Figure 4 compares the growth of the warranted wage to the development of real product wages in the seven sectors and for aggregate manufacturing. The two clearest examples of wage restraint are found in mining and metal, and paper and pulp. In these sectors, the scope for wage increases grew by over 100 % while real product wages increased at a significantly slower pace, in mining and metal by 38 % and in paper and pulp real wage costs fell by 10 %. Wage restraint is also found in the wood and food industries, while warranted and real product wages grew at basically the same rate in the leather, hair and rubber industry. Only two sectors: quarrying and textile and clothing, show worker militancy in relation to the scope for wage growth. In the former, this was driven by the substandard productivity developments as real product wages did not grow, but rather remained flat. These two sectors are small in terms of overall employment, however, which is also reflected in the figures for aggregate manufacturing where there is clear evidence of wage restraint, the warranted wage grew by 77 % over the period while real product wages grew by a mere 17 %.

Figure 4: *Growth of Warranted and Real Product Wages, 1935–1950*



Source: Authors' calculations from Schön (1988), Official manufacturing statistics (*SOS Industri*) and official wage statistics (*SOS Löner*).

Taken as a whole, therefore, there is clear evidence that wages did not grow at the same rate as the scope for wage increases in the manufacturing sector. This suggest that as whole the period from 1935 to 1950 was characterized by wage restraint.

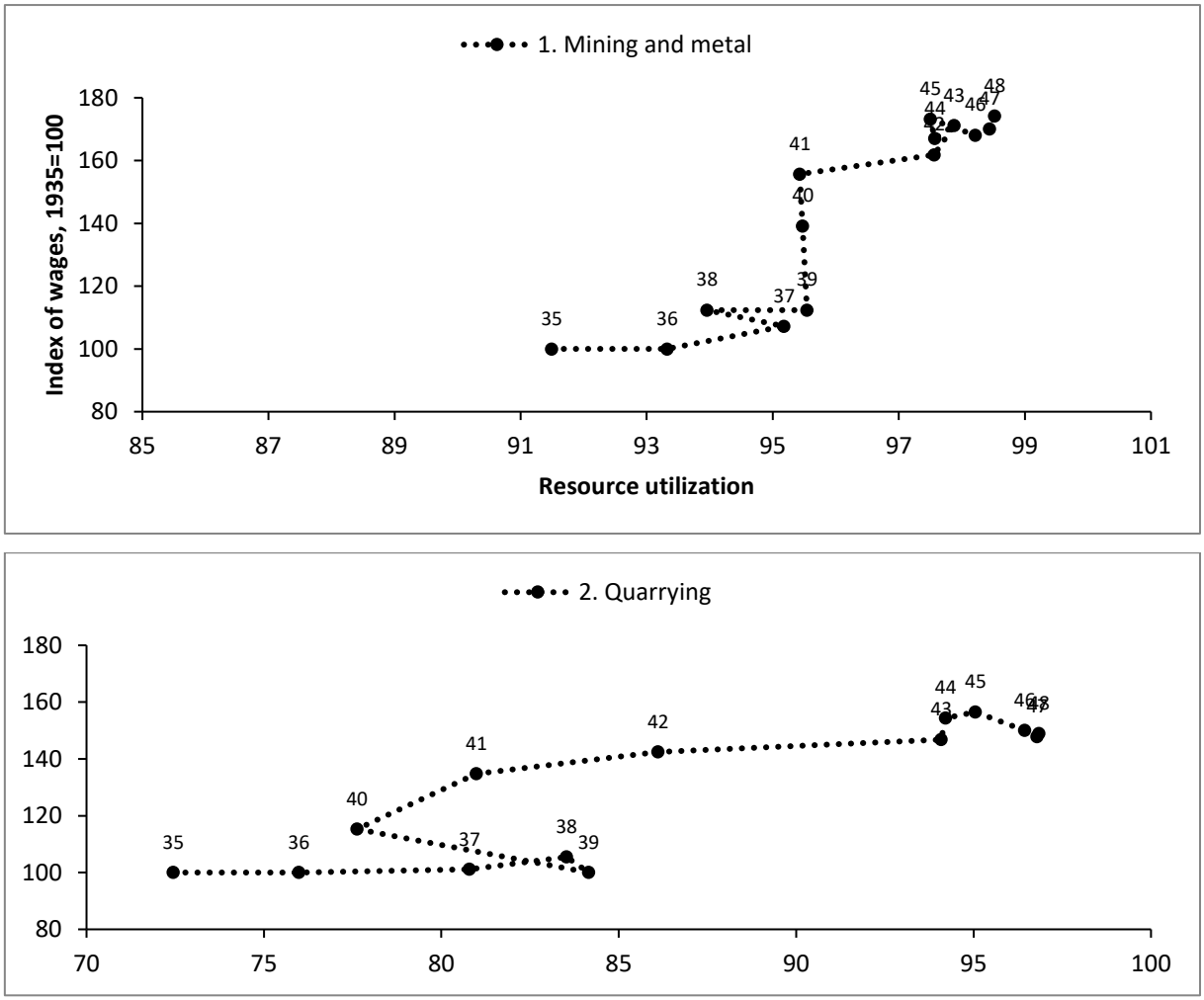
Hypotheses 2: Resource Utilization and Wage Inflation

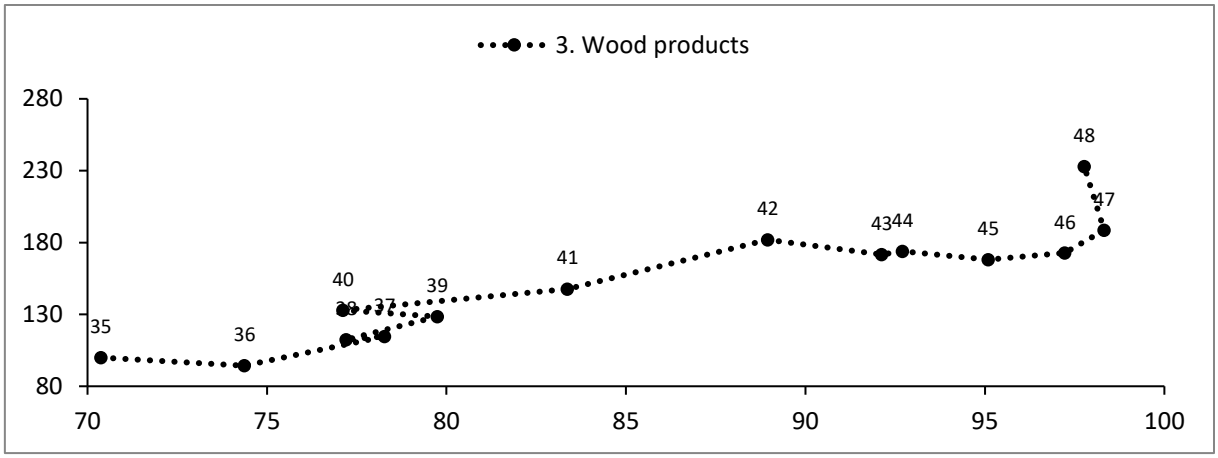
The second hypothesis relates to the co-movement of unemployment and inflation in which falling unemployment combined with stable or falling nominal wages suggest that a shift in supply has taken place. Looking at resource utilization and wage inflation in this way allows for a more detailed look at the pattern from year to year, making it possible to pinpoint more clearly when there was restraint in the growth of wages. The result for each manufacturing subsector as well as for manufacturing as a whole is shown in Figure 5.

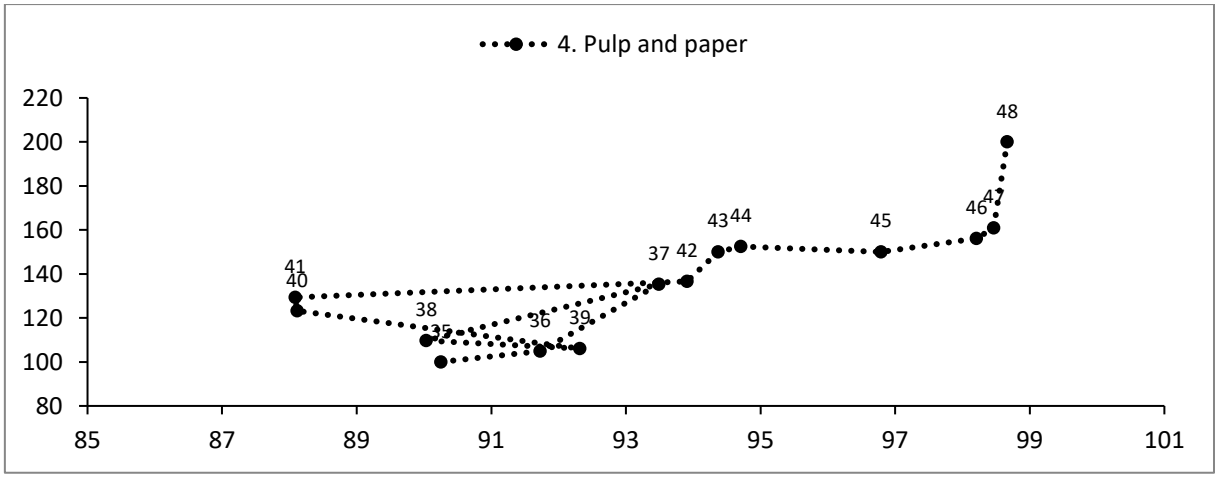
Looking at the patterns across the different industries as well as for manufacturing taken together, there were two periods of a significant increase in resource utilization that was not accompanied by wage inflation. The first begins in 1935 and ends at the start of the Second World War; the period of recovery from the Great Depression. The change is most visible in those sectors with the highest unemployment at the onset of the recovery. In the quarrying and wood industries unemployment was above 20 percent but fell rapidly without any visible impact on wage inflation.

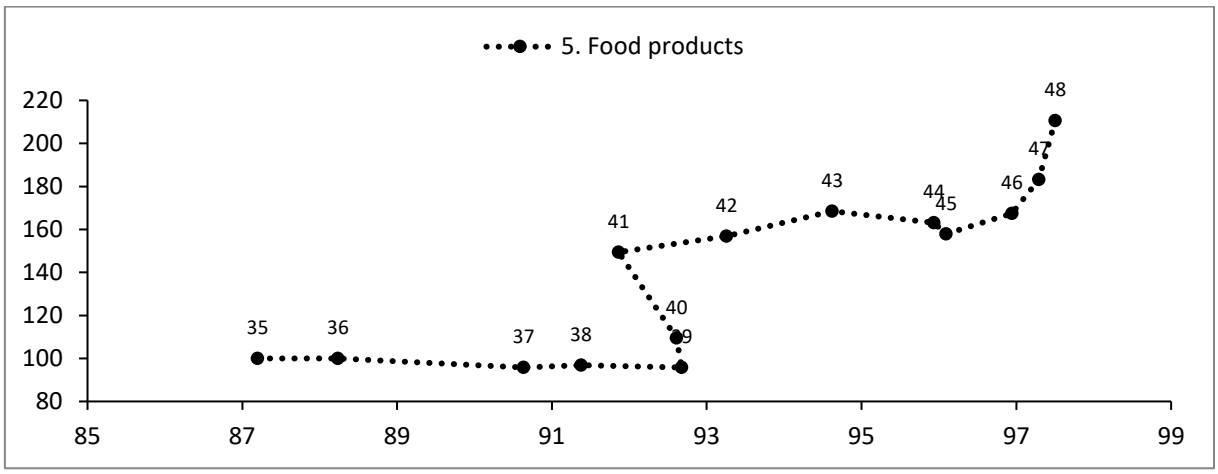
During the initiation of the war, the situation was different. As international markets were shielded off, there was an upsurge in nominal wage inflation following a general increase in consumer prices. Except for sectors such as textiles and quarrying, where joblessness rose with the start of the conflict, resource utilization remained constant between 1939 and 1941 while nominal wages shot up. This appears to have been a temporary shift however and did not entail a continuous spiral of wages and prices. Looking at the aggregate of the manufacturing industry, resource utilization fell by about two percentage points during the 1939–40 period while the change in nominal wages rose by 9 percent.

Figure 5: *Resource Utilization and Nominal Wages, 1935–1948*




3. Wood products
280
230
180
130
80
70
75
80
85
90
95
100
35
36
40
39
41
42
43
44
45
46
47
48


4. Pulp and paper
220
200
180
160
140
120
100
80
85
87
89
91
93
95
97
99
101
41
40
38
37
36
39
42
43
44
45
46
47
48


5. Food products
220
200
180
160
140
120
100
80
85
87
89
91
93
95
97
99
35
36
37
38
39
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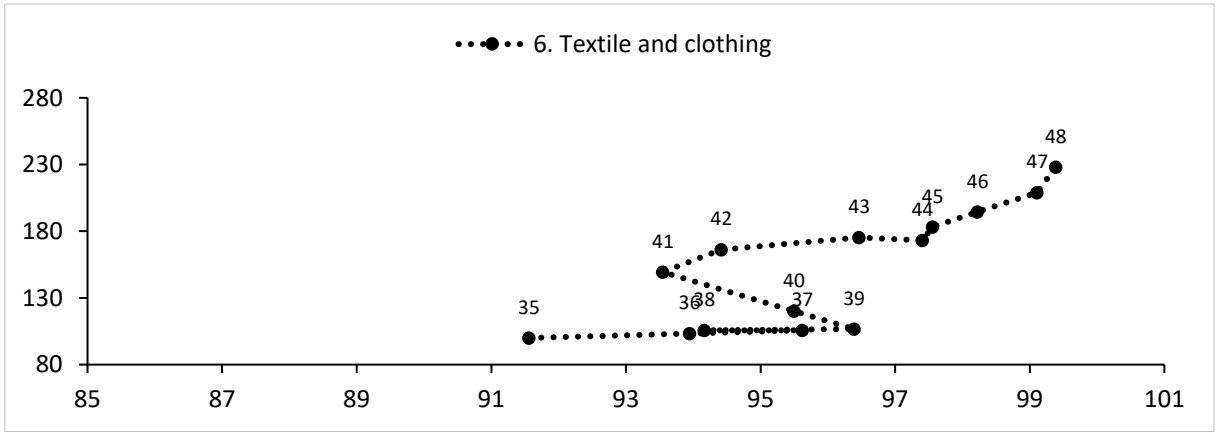
6. Textile and clothing
280
230
180
130
80
85
87
89
91
93
95
97
99
101
35
36
37
38
39
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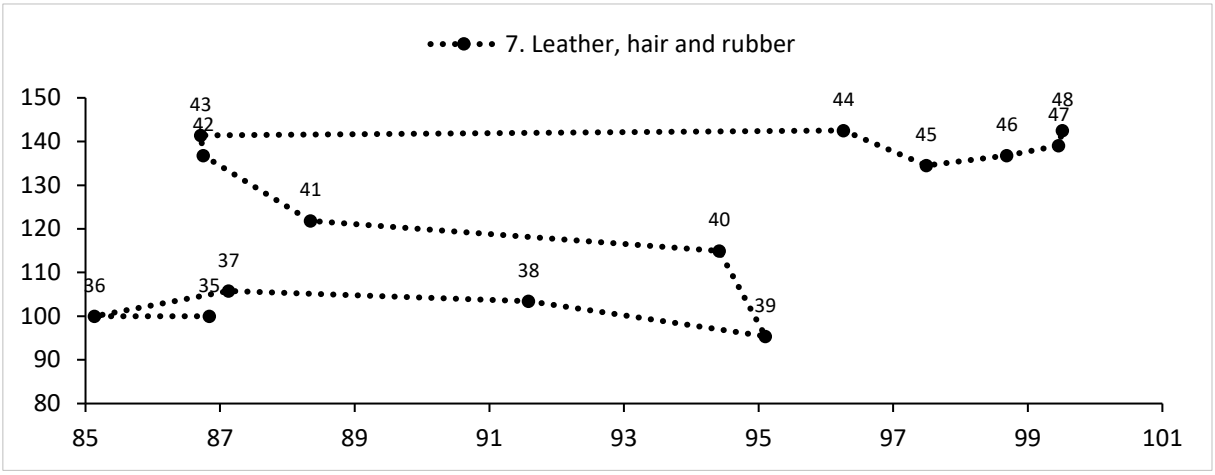

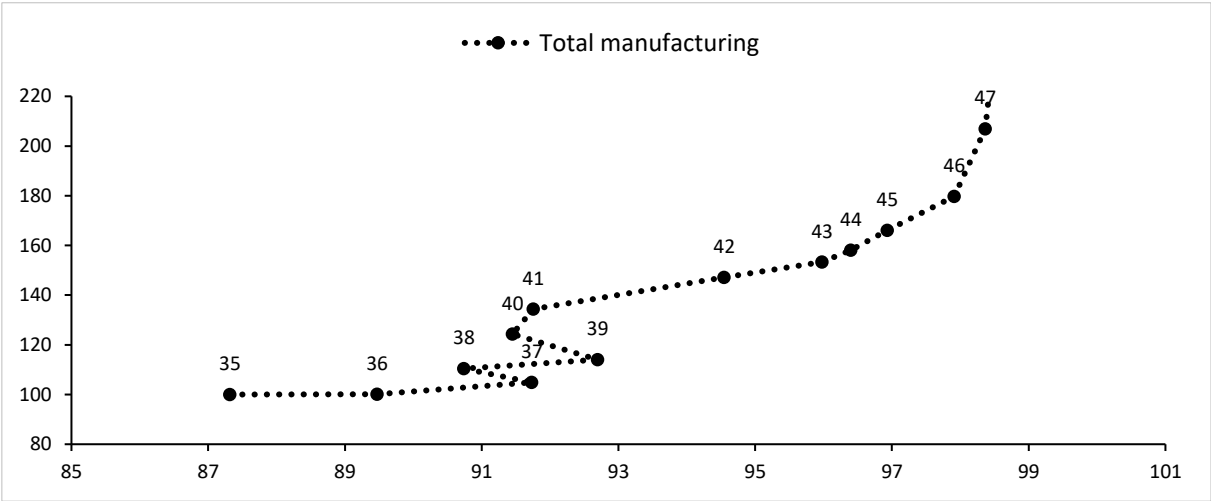

Note: Wage index 1930=100, Resource utilization defined as (100-unemployment rate).

The second period with a significant shift begins around 1941. From this year until the early postwar period, resource utilization increases markedly without a significant impact on wage inflation. In metal and manufacturing, for example, unemployment fell from 4,6 percent in 1941 to 1,8 percent in 1946, while nominal wage grew by only 8 percent. The same is true for the other sectors; resource utilization increased continuously while wage inflation was modest or inexistent. Sometime around 1946, the shift came to a stop. From this level, any further drop in unemployment was coupled by rapidly growing nominal wages. For manufacturing as a whole, unemployment fell from 2.1 percent in 1946 to 1.6 in 1948 while nominal wages grew by as much as 26 percent, suggesting that the new equilibrium lay somewhere around two percent.

The period beginning with the recovery from the great depression around 1935 marks a significant shift in equilibrium unemployment in Sweden. Joblessness fell rapidly without excessive upward pressure on wages. For manufacturing as a whole, the shift appears to have been finalized by 1946 when unemployment was down to 2 percent, falling from a

peak of 13 percent in 1935. From this point on, aggregate demand seems to be the driver of any further decline in unemployment and rising resource utilization was associated with rapidly rising wages.

Summing up the analysis in this section, the results demonstrate that the period from 1935 to 1948 was marked by a substantial shift on the Swedish labor market. Unemployment fell rapidly across all sectors of manufacturing without putting excessive pressure on prices and wages. In the majority of subsectors and for aggregate manufacturing, real product wages grew less than the warranted wage, indicating the presence of wage restraint. For aggregate manufacturing, warranted wages grew by 77 percent while wage costs only increased by 17 percent. Considering the path of resource utilization and wage inflation confirms this result, but provides more detail on at what point in time the shift took place. There were two periods of significant declines in unemployment without corresponding pressures on nominal wages. The first from 1935 to 1939, when the economy recovered from the Great Depression. The second from 1941 to the early postwar years, when unemployment continued to decline even further without pressure on wages. From around 1946, unemployment continued to fall in some sectors, but appear now as the consequence of increasing demand rather than an improvement on the supply side. In the ensuing section, I discuss the implication of these results for previous explanations of Sweden's low postwar unemployment.

6. Conclusion: A Revaluation of the Factors Explaining Sweden's Low Postwar Unemployment

In this paper, I have established that unemployment fell continuously from mid-1930s to the years immediately after the Second World War and that this fall was general and not the result of changes to the composition of unions underlying the aggregate figures. Examining the existence of wage restraint, I found that wages grew below the warranted wage for the vast majority of manufacturing sector workers; two periods of wage moderation in particular could be discerned. The first beginning in 1935 and ending with the onset of the war, and the second from around 1941 to the years just after the conflict receded.

The literature review exposed that previous explanations attribute the low postwar unemployment in Sweden to labor market institutions of the 1950s and 1960s or to Keynesian fiscal policies and the shortage of labor brought about by the war. Both explanations have difficulty explaining Sweden's shift to full employment. Labor market institutions cannot

explain why unemployment fell in the 1930s and 1940s. Likewise, expansionary fiscal policies cannot account for the fact that unemployment dropped without resulting in inflationary pressures. My results show that explanations should instead be sought which can explain why wages where held down during the time of falling unemployment between the mid-1930s and the years just after the Second World War.

In many ways the Swedish experience imitates that of the UK. While textbook theories of unemployment often link increased equilibrium unemployment to factors such as net replacement rates from unemployment insurance schemes, tax rates, union density and collective agreement coverage. Both in Sweden and the UK, this theory would predict an increase in unemployment between the interwar and the postwar period, rather than the decrease actually observed. Consequently, Broadberry (1994) finds that the influential model of Layard and Nickel (1985) would predict an increase in unemployment across the Second World War in the UK. In their study of the UK unemployment experience over the 1870 to 1999 period, Hatton and Boyer (2005) find that none of the variables usually thought to determine the equilibrium unemployment rate can explain why unemployment was much lower in the postwar period.

The Swedish case shows the wider bearing of the UK experience. In both cases, low postwar unemployment has been linked to centralized wage bargaining and corporatist policy structures that do not appear to be able to explain the particular situation in the golden years. Indeed, Sweden has often been seen as one of the clearest cases of postwar corporatist policy structures producing impressive labor market outcomes in the 1950 and 1960s. It similarly rejects standard models such as the one presented by Layard, Nickell and Jackman (1990), that have been used to explain why unemployment rose from the 1970s across the industrialized world, and which still dominates the analysis of equilibrium unemployment. None of the factors that are often used to explain the increase in unemployment such as replacement rates, union strength and tax rates moved in the predicted direction in Sweden over the period when unemployment fell.

Similar studies could be made of other countries, as unemployment histories often follows a similar pattern in many cases. Most countries experienced a period of stable and low unemployment in the 1950s and 1960s, contrasting much higher rates in the interwar period. It could be especially fruitful to study other non-belligerent countries as the period of the Second World War seems to be key, but cannot be studied satisfactory in countries where this time signified a substantial deviation from normal peace time economic conditions such as in the UK and the US.

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