DEPARTMENT OF ECONOMICS

DISCUSSION PAPER SERIES

PUBLIC POLICY AND UNEMPLOYMENT IN INTERWAR FRANCE: AN EMPIRICAL APPROACH

Tony Syme

Number 55

December 2000

Manor Road Building, Oxford OX1 3UQ
Public Policy and Unemployment in Interwar France:

An Empirical Approach

Tony Syme

Department of Economics, University of Oxford

Abstract

This paper introduces an empirical model of the French interwar labour market that is comparable to models developed for the British labour market for this period, yet incorporates specific extensions in order to capture the peculiarities of the French case. The result is a model that can very accurately simulate the movement of unemployment in the 1920s and 1930s and this is used to run a series of counterfactual simulations to estimate the labour market effects of various public policies adopted at the time. Of particular note is the result that the repatriation drive of the early 1930s had no significant effect on the size of foreign labour force by 1936 and that the decision to remain on the Gold Standard until 1936 raised unemployment each year by more than primary policies introduced to combat unemployment - public works and repatriation of foreign workers - reduced it.

December 2000

JEL Classification: J2, J6, N34

Keywords: France, unemployment, gold standard, repatriation, public works, 1930s, Popular Front

Acknowledgements: The research related to this paper was funded by the Economic and Research Council. I am grateful to Steve Broadberry and Andrew Oswald and seminar participants at the University of Warwick for comments. Any errors are entirely my responsibility
The development of an empirical model of the labour market brings the analysis of French interwar unemployment into line with much of the contemporary analysis if unemployment in interwar Britain, where the debate over the relative importance of aggregate demand, real wages and unemployment levels has been constructed largely within the field of quantitative analysis.¹ Such an approach has not been adopted with regard to analysing the French labour market between the wars, with the exception of the work of Pierre Villa (1991, 1993).

This approach has a further objective. In line with quantitative studies of the likely labour market consequences of the 1929 Lloyd George proposals for public works programmes,² this paper seeks to examine the effectiveness of the various French measures undertaken in the 1930s to curb the rising unemployment. However, we do not limit ourselves to those policies aimed directly at reducing unemployment, but also those that had a significant indirect effect on unemployment.

The model used for this simulation analysis is outlined in the next section. Although it based on the Nickell-Layard (1985, 1986) imperfectly competitive model of the labour market, particular attention is paid to the extensions necessary for it to be able to adequately simulate the movement of unemployment in France during the interwar years. The regression results are presented in the second section and it is these results that form the basis for the simulation model upon which the counterfactuals are analysed in the following section. This section presents

¹ These have been largely within the setting of a full structural model of the labour market – see Hatton (1988), Beenstock and Warburton (1991) and Dimsdale et al (1989), in particular – although alternative approaches such as Broadberry (1986) and Crafts (1987) have concentrated solely upon the aggregate wage equation as the main area of contention.
results on the effectiveness of a number of French public policies of the 1930s. Concluding comments are offered in the final section.

1. The Model

The central assumption made about the French economy of the interwar years is that it was imperfectly competitive. The model employed to describe this type of economy is based on that of Layard and Nickell (1985, 1986), though this model needs to be extended in two directions to capture the specificities of the French labour market. Many authors have highlighted the widespread adoption of short time working in French industry as a response to the unemployment of the 1930s, which suggests there may be a justifiable inclusion of the firm’s demand for hours as well as for employees within the demand for labour services schedule. Secondly, others have acknowledged the very large migratory movements of foreign workers into and out of France in response to labour market conditions. Hence, labour supply may not be a purely exogenous element within the model, and more specifically, domestic and foreign workers may not be homogenous groups within the aggregate labour supply function. Thus they should be modelled separately. Naturally, these extensions to the base Nickell-Layard model are dealt with in greater detail than the rest of the model.

Firms

The first extension to the base imperfectly-competitive model is to make average hours of work endogenous. Thus the production function is specified such that the factors of production are expressed in both their stock and flow components:

---

4 See Bunle (1943), Bonnet (1976) and Cross (1983) for the leading works in this field.
where $Y$ is output, $A$ is labour-augmenting technical progress, $N$ is employment, $H$ is average hours of work, $K$ is capital services and $M$ is ‘other inputs’. The price-setting of firms within this economy is depicted by a simple mark-up over the marginal cost function of equation (1), which is inversely related to the expected level of aggregate demand ($\sigma^e$). If we note that firms adjust their capacity utilisation rate (CU) in response to short-run variations in the level of aggregate demand, we can use this variable as its proxy. The aggregate price equation is this specified as:5

\begin{equation}
(2) \quad p = p(w + t_1, a, p_m, CU, y - n - h)
\end{equation}

where $P$ is the product price, $W$ is the nominal wage, $t_1$ is the rate of employer social security contributions and $P_m$ is the price of imports.6 The production function can also be used to eliminate the output variable from (2) to derive the demands for workers and hours, which if we impose the standard assumption of long-run homogeneity of standard and average hours of work, is given by:

\begin{align}
(3) \quad n &= n\left(w + t_1 - p, a, p_m - p, k, \left(h - h^e\right)_{-1}, \sigma^e\right) \\
(4) \quad \left(h - h^e\right) &= h\left(w + t_1 - p, a, p_m - p, k, n, \sigma^e\right)
\end{align}

5 Variables written in italics are in logarithmic form.
6 In aggregate, imports and inputs are the same thing so the price of imports may be used for the price of inputs (Dimsdale et al. 1989, note 9, p.279).
where $H^s$ is the standard length of the working week and the aggregate demand term is no longer proxied by the capacity utilisation variable. The demand for hours schedule can be interpreted as a rate of labour utilisation function. It therefore represents short-run deviations of average hours of work from standard hours of work. In equilibrium, therefore, employment is not influenced by the hours of work and equation (4) collapses out of the system as average hours are equal to the standard level.

However, this labour services sub-model is not identifiable and the demand for labour services needs to be considered further. The framework adopted is that of interrelated factor demands which was pioneered by Nadiri and Rosen (1969, 1973). By this approach, each component of the labour services function has its own separate long run expression, but the dynamic adjustment paths towards these long run equilibria are assumed to be interrelated, thus disequilibrium in the demand for workers can influence the (compensatory) demand hours and vice-versa.\(^7\)

A factor that needs to be considered is that the sample period over which the model is to be estimated contains a large change in the length of the standard working week.\(^8\) Despite the assumption that average hours are homogenous with respect to standard hours in the long run, the adjustment of average hours to a new long-run equilibrium around this new level of standard hours may not be instantaneous and thus will affect the (interrelated) adjustment paths of hours and labour.

---

\(^7\) Although the full Nadiri and Rosen system comprised of six equations for production workers, hours, capital stock, capital utilisation, inventories and non-production workers, we have adapted the model to just the two equation, labour services component.

\(^8\) Although the metallurgical industry had implemented the 40-hour week in October 1936, the majority of industries did so in 1937. We therefore define the change in standard hours to have taken place in 1937.
demand. Hence, taking account the structural break in hours of work, the dynamic adjustment paths can be expressed as:

\[
\begin{align*}
\Delta N &= \lambda_{11}(N^* - N_{-1}) + \lambda_{12}(H^* - H_{-1}) + \lambda_{13}(H' - H_{-1}) \\
\Delta H &= \lambda_{21}(N^* - N_{-1}) + \lambda_{22}(H^* - H_{-1}) + \lambda_{23}(H' - H_{-1})
\end{align*}
\]

where \(N^*\) and \(H^*\) are the ‘optimal’ levels of employment and hours of work respectively. If ‘optimal’ employment and hours are given by equation (3) and (4) respectively, substitution of equation (5) into both equations yields the aggregate demands for workers and hours:

\[
\begin{align*}
n &= n\left(w + t_i - p, a, p_m - p, k, n_{-1}, (h - h^*)_{-1}, \sigma^e, \Delta h^*\right) \\
(h - h^*) &= h\left(w + t_i - p, a, p_m - p, k, n_{-1}, (h - h^*)_{-1}, \sigma^e, \Delta h^*\right)
\end{align*}
\]

To make this labour services sub-model identifiable the following restriction on equation (5) must be imposed:\(^9\)

\[
\lambda_{12} = \lambda_{11} - 1 \quad \text{and} \quad \lambda_{21} = \lambda_{22} - 1
\]

As an aside, using the identification restriction (8), the aggregate desired levels of employment and labour utilisation can also be solved from (5), which yields:

---

\(^9\) However, Nadiri and Rosen (1969) do not impose the restriction and so their results are difficult to interpret. Indeed, non of the studies surveyed in Hamermesh (1993, table 7.4, pp.265-67) seem to have applied the restriction or to have found the important negative sign on \(\lambda_{21}\). One exception is Kokkelenberg (1983).
(9) \( N^{*} = N - \left[ \left( \frac{\lambda_{12}}{1 + \lambda_{12} + \lambda_{21}} \right) \Delta N + \Delta \left( \frac{H}{H^{*}} \right) \right] - \left[ \left( \frac{\lambda_{13} + \lambda_{13} \lambda_{21} - \lambda_{23} \lambda_{12}}{1 + \lambda_{12} + \lambda_{21}} \right) \Delta H^{*} \right] \)

(10) \( \left( \frac{H}{H^{*}} \right)^{*} = \left( \frac{H}{H^{*}} \right) - \left[ \left( \frac{\lambda_{21}}{1 + \lambda_{12} + \lambda_{21}} \right) \Delta N + \Delta \left( \frac{H}{H^{*}} \right) \right] - \left[ \left( \frac{\lambda_{23} + \lambda_{13} \lambda_{21} - \lambda_{23} \lambda_{12}}{1 + \lambda_{12} + \lambda_{21}} \right) \Delta H^{*} \right] \)

With regard to the aggregate demand variable, \( \sigma_{e} \), we assume this to be a function of competitiveness \( (P_{f}/P) \) and government expenditure as a proportion of GDP \( (z) \). These variables are chosen specifically to enable further investigation of the labour market effects of various public policies in the 1930s. The first variable allows the analysis of exchange rate policy, while the second allowed the analysis of the effects of the counter-cyclicality of public expenditure in the 1930s. However, it is important to note that the main force behind the continued rise in real government expenditure in the 1930s was more the ability to cut costs than an increase in public works expenditures, but its ex post counter-cyclical nature would have provided an unintended stimulus to the labour market.

**Households**

The labour supply function is derived from the standard maximisation of the representative household’s utility function with respect to the budget constraint. The solution to this problem, over all households, is given by:

(11) \( l = l \left( w - t - p^{*}, U, b - p^{*}, i - p^{*} - pop, pop_{w}, h - h^{*} \right) \)
where \( t_2 \) is the direct tax rate, \( P^c \) is consumer prices, \( U \) is the aggregate rate of unemployment, \( B \) is unemployment compensation, \( I \) is per capita non-wage income and \( \text{POP}_w \) is the population of working age which is added as a normalising factor. Note that as hours of work are endogenous to the model, the budget constraint is dependent upon the deviation of hours of work from their ‘standard’ level and so the rate of labour utilisation also enters the labour supply function.

As mentioned earlier, there is an extension to the labour supply function that can be made: a relaxation of the assumption that domestic and foreign workers are homogenous groups within the aggregate labour supply function. The literature on the supply of foreign labour concentrates on the worker’s decision to migrate to/from the host country rather than of the existing stock. However, it is possible to use this analysis of the flows of foreign labour to construct an analysis in terms of the stock of foreign labour.\(^{10}\) The crucial assumption is that all foreign workers resident in France (the host country) review their migration decision annually, the periodicity of the data.\(^{11}\)

\(^{10}\) Consider the following illustration. Let us assume that the migration decision is based upon a vector of economic variables \( \mathbf{X} \) within the host country France \( i \) and the home country \( j \). The (0,1) migration probability function for the foreign workers entering the host country is

\[
\text{Pr}(\text{migration}_{ij}) = \sigma_0 + \sigma_1 X_i + \sigma_2 X_j = 1,
\]

for foreign workers returning to their home country from the host country,

\[
\text{Pr}(\text{migration}_{ji}) = \zeta_0 + \zeta_1 X_i + \zeta_2 X_j = 1,
\]

and for foreign workers resident in the host country who decide to remain within that country,

\[
\text{Pr}(\text{migration}_{ii}) = \tau_0 + \tau_1 X_i + \tau_2 X_j = 0.
\]

The aggregate supply of foreign workers within the host country at the end of this decision process is given by

\[
F = (\sigma_0 - \zeta_0 + \tau_0) + (\sigma_1 - \zeta_1 + \tau_1) X_i + (\sigma_2 - \zeta_2 + \tau_2) X_j
\]

which is entirely specified in terms of migration variables.

\(^{11}\) While this is a rather restrictive assumption for all foreign workers in the host country, it is not entirely unreasonable approximation: the majority of work permits for foreign workers were of one year duration. In a survey of work permits for foreign workers, the Prefect of the Isère département found the following: 2% were for three months, 19% were for six months, 2% were for nine months, and 77% were for twelve months (Archives Nationales, F 13525, Report of the Prefect for Isère on the Labour Market Situation, 3 January 1927). Similarly, short-term identity cards were issued for no more than one year (Bonnet, 1976, p.291).
With regard to the determinants of the migration decision, the standard model is that of Todaro (1969, 1976) which is expressed solely in terms of ‘push’ and ‘pull’ variables. Thus migration is dependent upon \((W/P^c)\) and \(U\), the French consumption real wage and unemployment rate, and \((W/P^c)^f\) and \(U^f\), the ‘foreign’ consumption real wage and unemployment rate. The latter two variables are weighted averages of these variables in the primary countries that provided migrants to the French labour market in the interwar years.

However, this ‘push-pull’ model rests exclusively upon the supply-side of the migration decision process, it does not consider the demand for foreign workers in the host country. To bring this model more into line with the specificity of the French interwar labour market, two further variables are introduced into this migration (foreign labour supply) function to reflect these demand-side factors. The loss of nearly 1.5 million men in the First World War and the continued fall in the birth rate caused a demographic hole in France that could only be filled by an organised immigration drive.\(^{12}\) To proxy this type of demand for foreign labour, we include the growth rate of domestic labour supply as an additional variable.

Another indication of the domestic demand for foreign labour can be given by the attitudes of the public authorities towards foreign workers. A variable is thus created as the proportion of the foreign worker population repatriated in any one year, the ‘repatriation rate’. However, this variable would only measure the proportion of the foreign worker population *officially* repatriated; a great number of foreign workers left France voluntarily once they had been made

\(^{12}\) The net rate of natural increase in population in the 1920s was only two per 1,000 per year. Hence, net immigration accounted for over 75% of the total population increase in the period 1921-1930 (Cross, 1983, p.71; Tapinos, 1975, p.7).
unemployed and thus avoided being forcibly repatriated (see Syme 1997, chapter 4.2). A variable, \( M' \), is thus constructed as the proportion of the foreign worker population leaving France, voluntarily or not, in any one year, the ‘remigration rate’.

The foreign labour supply schedule is now given by

\[
\begin{align*}
\frac{df}{dU} &= f\left( w - p^c, \left( w - p^c \right)^f, U, U^f, \Delta d, M^f \right)
\end{align*}
\]

where \( \Delta d \) is the growth rate of domestic labour supply and \( M^f \) is the remigration rate.

With the splitting of aggregate labour supply into its domestic and foreign worker components (D and F respectively), (11) must be restated for the supply of domestic labour as

\[
\begin{align*}
\frac{dd}{dU} &= d\left( w - t_z - p^c, U, b - p^c, i - p^c, \text{pop}_d^d, h - h^d \right)
\end{align*}
\]

where aggregate labour supply is the sun of the two parts (\( L = D + F \)).

**Wages**

Consistent with the assumption of an imperfectly-competitive economy, workers are assumed to be able to influence the nominal wage to some degree. This bargaining process is outlined later, but first we follow the approach taken by Hatton (1988) who specifies a short-run adjustment mechanism with a long-run relationship embedded within it. This wage adjustment process is assumed to be given by
\[ \Delta w_t = \mu_1 \Delta p_t^c + \mu_2 \left[ (w - p^c)_t - (w - p^c)_{t-1} \right] \quad \mu_1, \mu_2 > 0 \]

where \((w-p^c)^*_t\) is the ‘target’ consumer real wage. Hence, workers seek to affect nominal wages to compensate for changes in the consumer price level (inflation) and for any deviation of last period’s real wage from the ‘target’ real wage period. The long run solution to (14) is given when \((w-p^c)=(w-p^c)^*_t\), which suggests that when wage and price inflation is zero, real wages are given by the determinants of the ‘target’ real wage.

The approach adopted to the modelling of the ‘target’ real wage is that of the insider-outsider model of wage determination, particularly as outlined by Lindbeck and Snower (1989, 1990). Within this framework it is not important that unions actually exist or are numerical strong (which they were not in France at this time), merely that workers act collectively. It is this rent-creating collective activity that enabled workers to bargain with firms over wages.

Within the Lindbeck-Snower model, real consumer wages are determined by the probability that the representative worker will be fired after the wage bargain and the level of outside employment opportunities and incomes in that case. The ‘target’ real wage function is therefore given by:\[13\]

\[ \Delta n = \Delta U \]

Through the assumption that the coefficient on the \(\Delta n\) is positive and using the identity \(\Delta n = \Delta U\), the insider-outsider model thus predicts hysteresis in unemployment. However, this hysteresis effect is not expected to be very strong for the French interwar labour market as the assumption of a constant labour force, necessary for the above identity to hold, is not expected to be observed.
If we note that wages are expressed in hourly terms and that the reduction in standard hours in 1937 was intended to be fully-compensated, the standard hours of work variable may be added to equation (15). Substitution of the ‘target’ real wage function into the wage adjustment mechanism above yields the following wage function which is essentially Phillips curve relationship:

\[
(15) \quad \left( w - p^e \right)^* = w \left( U, b - p^e, \Delta n, t, \right)
\]

\[
(16) \quad \Delta w = w \left( \Delta p^e, U, \left( b - p^e \right), \Delta n, t, \Delta h, \left( w - p^e \right)_{t-1} \right)
\]

which serves as the wage equation in this imperfectly-competitive model of the labour market.

2. Regression Results

The dataset used for the empirical testing of the models developed in the previous section contains annual observations on a wide range of French economic variables covering the years 1919 to 1939. The primary source for this data is Villa (1993, 1994). But the use of annual observations for the interwar period creates a serious statistical problem as Hatton (1988, p.2) points out:

“This is a major drawback since one can employ at most 19 observations on an annual basis. Once one gets beyond very simple models with two or three variables, the number of degrees of freedom becomes rather small and hypothesis tests are increasingly open to doubt.”

\[14\] Some amendments and additions to this dataset are made, full details being outlined in Syme (1997, chapter 4).
This charge should particularly true for the model outlined in the preceding section which traded parsimony for simulation predictability. But this is a charge that can be levelled at virtually all of the leading empirical studies of the interwar labour market, regardless of country of study. The alternatives are very rarely found, with only Hatton (1988) and Dimsdale et al (1989), who both use quarterly data for Britain, and Bernanke (1986), who uses panel data for the US, being notable exceptions.

However, neither of these data formats can be easily applied to the French interwar labour market. Apart from the problems that arise from trying to identify the dynamic structure of estimating equations on quarterly data and the need to interpolate from annual series for rather too many key variables of interest, Villa (1994) finds that the seasonal component of the French unemployment series differed dramatically between the two periods 1920-1930 and 1931-1938. A similar investigation of the employment and hours of work series also produced the same result. The standard procedure of estimation with seasonal dummies is therefore not appropriate as the seasonality of the main endogenous variables is not time-invariant.

The alternative of using a panel dataset across industries, or regions, also poses a problem for the estimation of the model as none of the exogenous variables used in the simulation analyses of the previous section can be disaggregated into either regional or industrial components. All of the

---

15 Primary examples are Broadberry (1986), Beenstock and Warburton (1991) and Dimsdale and Horsewood (1995) for Britain; Corbett (1991, 1994) for Germany; and Villa (1993) for France. Indeed, with the exception of Villa’s study, the limited number of degrees of freedom is made worse by the sample period in each of these studies starting considerably later than 1920.

16 Hatton (1986) does investigate the regional and industrial structure of unemployment in Britain between the wars, using cross-section data for 1929, 1932 and 1936, but this is mainly an attempt to explain the composition of unemployment rather than its movement over time.

17 As the application of the 40-hour week is adopted across all industries in 1937, the disaggregation to the level of
potential benefits from using the available disaggregated series of endogenous variables are therefore wiped out by this aggregation problem. Given that there are problems associated with the alternatives to the dataset used earlier in this chapter, it would be appropriate to acknowledge the statistical limitations of the previous results, as pointed out in the Hatton (1988) quote above, and proceed with caution.

The results are presented in Table 1. The parameter estimates are generally of the expected sign and magnitude and there appears to be few problems of serial correlation or non-normality of the residuals, apart from the hours equation. In this equation, the imposition of the identifying restriction on this equation appears to have been only weakly supported by the data, but none of the tests are statistically significant at 5% critical values. The primary statistical fragility remains with the degrees of freedom.

In addition to the standard factor price determinants of employment and hours, the demand-side effects of competitiveness and public expenditure figure strongly. The predictions are that a devaluation of the currency will increase employment through an improvement in the terms of trade, but that this will be partially offset by an increase in input prices. The effect on real wages is ambiguous as it would raise both prices and nominal wages directly. The effect of an increase in government expenditure (relative to GDP) is more clear-cut. It will raise employment, but as this happens and unemployment falls, it will raise nominal wages and then prices. It becomes inflationary and less effective as full employment is approached.

industries brings no econometric benefit.
Table 1 Behavioural Equations

**Demand for Workers**

\[
\ln N = 2.769 + 0.409 \ln N_{-1} + 0.122 \ln \left( \frac{W((1+t_1)}{P} \right) + 0.452 \ln K \\
- 0.058 \ln a - 0.030 \ln \left( \frac{P_m}{P} \right) + 0.409 \ln \left( \frac{H}{H^s} \right)_{-1} + 0.087 \ln \left( \frac{P^f}{P} \right) \\
+ 0.756 z_{-1} - 0.095 \Delta \ln H^s
\]

\[
\bar{R}^2 = 0.990 \quad \text{s.e.} = 0.006 \quad \text{Durbin's } h = -1.449 \quad Q(2) = 2.950 \quad JB(2) = 1.085
\]

**Demand for Hours**

\[
\ln \left( \frac{H}{H^s} \right) = -0.578 - 0.192 \ln \left( \frac{H}{H^s} \right)_{-1} + 0.042 \ln \left( \frac{W((1+t_1)}{P} \right) + 0.358 \ln K \\
- 0.070 \ln a + 0.167 \ln \left( \frac{P_m}{P} \right) - 0.192 \ln N_{-1} - 0.032 \ln \left( \frac{P^f}{P} \right) \\
+ 0.150 \ln \left( \frac{P^f}{P} \right)_{-1} + 0.168 z_{-1} - 0.129 \Delta \ln H^s
\]

\[
\bar{R}^2 = 0.951 \quad \text{s.e.} = 0.010 \quad \text{Durbin's } h = -1.265 \quad Q(2) = 5.886 \quad JB(2) = 5.422
\]

**Supply of Domestic Workers**

\[
\ln \left( \frac{D}{POP^D_w} \right) = -0.639 - 0.052 \ln \left( \frac{W(1-t_2)}{P^c} \right) + 0.036 \ln \left( \frac{I}{P^c} \right) - 0.359 U \\
- 0.542 U_{-1} + 0.001 \ln \left( \frac{B}{P^c} \right) + 0.193 \ln \left( \frac{H}{H^s} \right)
\]

\[
\bar{R}^2 = 0.978 \quad \text{s.e.} = 0.006 \quad \text{D.W.} = 2.259 \quad Q(2) = 2.099 \quad JB(2) = 2.224
\]

**Supply of Foreign Workers**

\[
\ln F = 2.181 + 0.703 \ln F_t + 0.085 \ln \left( \frac{W}{P^c} \right) - 0.171 \Delta \ln \left( \frac{W}{P^c} \right) - 2.554 U \\
- 1.710 U_{-1} + 1.063 U^t_{-1} - 3.045 M^t - 2.872 \Delta \ln D
\]

\[
\bar{R}^2 = 0.988 \quad \text{s.e.} = 0.003 \quad \text{Durbin's } h = -0.924 \quad Q(2) = 1.341 \quad JB(2) = 2.047
\]
This ignores the supply-side of the model in which a reduction in unemployment is found to have a strong stimulus to the supply of labour, especially foreign labour. Thus the impact on unemployment of the above demand-side factors is muted somewhat by the supply-side response. This is further compounded by the responsiveness of domestic labour supply to the labour utilisation rate, an alternative measure of the tightness of the labour market. A worrying aspect of the domestic labour supply equation, though, is the negative parameter estimate on the real wage variable. The prior expectation is that it would have been positive or statistically insignificant from zero. This is the case for the foreign labour supply equation and suggests that
the labour supply response to an increase in the hourly real wage would have differed between the two types of workers, a result that is difficult to comprehend.

The other migratory ‘push’ and ‘pull’ factors appear to capture the movements in the stock of foreign workers, though the demand-side factors also figure prominently. Overall, the specification of a stock equation largely in terms of flow variables does not appear to have hindered its explanatory power.

The striking feature from the wage equation is that of a very weak ‘outsider’ mechanism, even if we accept that $\Delta \ln N \approx - \Delta U$, though see footnote 13 for a cautious note. This is not an unusual finding: Villa (1993) can only find a negative effect for a differenced unemployment variable in a very simple wage equation for the French interwar period; similarly, for Britain, Hatton (1988) is unable to find a negative influence of unemployment on wages, using the same type of wage adjustment equation as (14). Andrews (1988) likewise concludes during his survey of labour market models that the rate of unemployment is a poor proxy for labour market slackness, which may also account for the additionally strong effect of the labour utilisation rate upon domestic labour supply.

Given that the wage adjustment equations are the same, it is interesting to compare the wage equation results in Table 1 for interwar France with those of Hatton (1988) for interwar Britain. It would appear that wages were much more flexible in France than in Britain in this period: from the wage equation in Table 1, it would take three years to eradicate 90% of a one-period
discrepancy between actual and ‘target’ real wages, for Britain, it would have taken 29 years.\textsuperscript{18}

Finally, the results for the price equation appear to confirm that prices were largely determined as a mark-up over marginal costs, with that mark-up itself being affected by aggregate demand factors. Before considering the simulation exercises on the model in Table 1, it is worth looking at the employment effects of the reduction in 1937 with the results from the inter-related labour services sub-model.

The parameter estimates in Table 1 can also be used to derive the ‘optimal’ level of employment and hours. If we recall that the cross-adjustment coefficients are calculated as $\lambda_{ij}$, i\(\neq\)j, and from (8) that the own-adjustment coefficients are calculated as $\lambda_{ij}+1$, i\(\neq\)j, the coefficients are:

<table>
<thead>
<tr>
<th></th>
<th>$\ln N$ ($\lambda_1$)</th>
<th>$\ln (H/H^*)$ ($\lambda_2$)</th>
<th>$\Delta \ln H^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ln N$ ($\lambda_1$)</td>
<td>0.591</td>
<td>-0.409</td>
<td>-0.095</td>
</tr>
<tr>
<td>$\ln (H/H^*)$ ($\lambda_2$)</td>
<td>0.192</td>
<td>1.192</td>
<td>-0.129</td>
</tr>
</tbody>
</table>

All the coefficients are of the correct sign and magnitude. The own adjustments coefficients on employment is significantly lower than that on labour utilisation, indeed it would appear that hours of work overshoot their optimal levels to compensate for disequilibrium in the firm's demand for workers. This compensatory behaviour of the demand for hours is confirmed by the positive value for $\lambda_{21}$. The values of the $\lambda$’s can now be substituted into equations (9) and (10), alongside current and lagged values of the endogenous variables, to reveal the ‘optimal’ level of workers and hours.

\textsuperscript{18} The comparable estimate of $\mu_2$ from Hatton (1988, Table 3, equation 1, p.17) is 0.078.
Figure 1 Actual and 'Optimal' Employment

Figure 2 Actual and 'Optimal' Hours of Work
The results are presented in Figures 1 and 2.

The ‘optimal’ increase in employment following the workweek reduction is much greater than the actual increase. Again, this may be due to labour shortage, and authors such as Marjolin (1938) and Sauvy (1967) have argued that there was a skilled labour shortage despite the high levels of unemployment, but others such as Margairaz (1991) and Vinen (1991) have argued that this was an exaggeration made by employers to prevent the full implementation of the 40-hour week. If this was true, it would be expected from Figure 2 that actual hours of work in 1937 would have been above their ‘optimal’ level as firms limited the hours reduction to limit the need for extra labour. This is the case and it cannot be explained by hours being more costly to adjust than employment. However, another limit to the employment creation of the shorter working week may have been the large degree of labour hoarding in the 1930s that is also apparent from Figures 1 and 2. In 1932, actual employment was over 600,000 (or 7%) higher than ‘optimal’ employment and the average working week was 43.7 hours, which was 2% lower than the ‘optimal’ working week of 44.7 hours.

The unemployment-limiting effect of the enhanced short-time working and labour-hoarding policies may have been large at the height of the economic crisis, but the continuation of the latter, in particular, created an excess capacity in labour services that had to be utilised in 1937 before any employment-creating effects of the shorter working week were to be felt. Thus the moderate employment creation of 1937 is consistent with Villa’s (1993) finding that 90% of the reduction in hours in 1937 was compensated by increased labour productivity.

---

19 See Syme (1997, chapter 3.3) for a full discussion.
3. Simulation Analysis

In this section the model presented in Table 1 is simulated to test its ability to track the movement of French unemployment during the interwar years. The result, as shown in Figure 3, is impressive: there is no systematic under- or over-prediction, the turning points are generally identified and the simulated unemployment rate is always within a ‘one-fifth of standard error’ band around actual employment. This compares favourably in comparison to Beenstock and Warburton’s (1991) simulated unemployment series for interwar Britain, for example. Their series is within a ‘one standard error’ band around actual unemployment with the exception of 1927. The simulated unemployment rate thus provides a very accurate baseline against which to investigate various counterfactual simulations in the 1930s, the results of which are presented in Table 2.

The simulations can be placed into two historical groups. The first four represent measures that were undertaken in the period 1931-36, of which only the repatriation drive was introduced as a direct measure to reduce the level of unemployment, the rest had indirect effects on unemployment. The remaining two simulations represent two of the economic policies implemented during the Popular Front years, though it should be pointed out that the decision to devalue the Franc in September 1936 was rather forced upon Léon Blum. It is important to remember in interpreting the results of Table 2 that the counterfactuals are that the policies were not implemented, and so the figures presented are an evaluation of the above policies that were implemented.

---

20 Indeed, the simulated series for all the endogenous variables track very closely their actual values, see Syme (1997, chapter 4.3 for further details).
As a result, the counter-cyclical *ex post* nature of government expenditure continued to reduce unemployment throughout the 1930s, albeit at a diminishing rate of effectiveness, whereas the effectiveness of the repatriation drive is almost negligible by 1936. At this point, unemployment is only 13,000 less than it would have been had there not been such an extensive (and expensive) introduction of controls of foreign labour, and the number of foreign workers in the labour market in 1936 is only 38,000 less than it would have been otherwise. This is a very small return relative to the 850,000 foreign workers who remained in the French labour market in 1936. The short-term gains from the first two policies may therefore have been considerable, but their effectiveness diminished rapidly, especially for the repatriation drive as the unemployment crisis ceased to abate.
Table 2 Simulations of the Model

### Simulation I

*The Labour Markets Effects of Countercyclical Government Expenditure, 1931-1938*

<table>
<thead>
<tr>
<th>Year</th>
<th>Real Wages (%)</th>
<th>Hours (%)</th>
<th>Employment</th>
<th>Domestic Labour Supply</th>
<th>Foreign Labour Supply</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931</td>
<td>0.08</td>
<td>0.65</td>
<td>41,666</td>
<td>16,541</td>
<td>1,150</td>
<td>-23,975</td>
</tr>
<tr>
<td>1932</td>
<td>0.48</td>
<td>1.53</td>
<td>146,114</td>
<td>55,354</td>
<td>14,639</td>
<td>-76,121</td>
</tr>
<tr>
<td>1933</td>
<td>0.94</td>
<td>1.81</td>
<td>261,518</td>
<td>98,553</td>
<td>46,047</td>
<td>-116,918</td>
</tr>
<tr>
<td>1934</td>
<td>0.95</td>
<td>1.07</td>
<td>291,321</td>
<td>108,532</td>
<td>82,633</td>
<td>-100,156</td>
</tr>
<tr>
<td>1935</td>
<td>0.52</td>
<td>1.14</td>
<td>270,410</td>
<td>100,745</td>
<td>96,590</td>
<td>-73,075</td>
</tr>
<tr>
<td>1936</td>
<td>0.47</td>
<td>2.19</td>
<td>320,692</td>
<td>115,181</td>
<td>104,535</td>
<td>-100,076</td>
</tr>
</tbody>
</table>

### Simulation II

*The Labour Markets Effects of the Repatriation Drive, 1931-1936*

<table>
<thead>
<tr>
<th>Year</th>
<th>Real Wages (%)</th>
<th>Hours (%)</th>
<th>Employment</th>
<th>Domestic Labour Supply</th>
<th>Foreign Labour Supply</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931</td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>10,378</td>
<td>-45,304</td>
<td>-34,926</td>
</tr>
<tr>
<td>1932</td>
<td>0.02</td>
<td>0.00</td>
<td>-317</td>
<td>51,992</td>
<td>-179,386</td>
<td>-127,077</td>
</tr>
<tr>
<td>1933</td>
<td>0.08</td>
<td>-0.01</td>
<td>-1,447</td>
<td>73,084</td>
<td>-138,745</td>
<td>-64,214</td>
</tr>
<tr>
<td>1934</td>
<td>0.08</td>
<td>-0.01</td>
<td>-2,060</td>
<td>37,680</td>
<td>-75,849</td>
<td>-36,109</td>
</tr>
<tr>
<td>1935</td>
<td>0.06</td>
<td>-0.01</td>
<td>-2,284</td>
<td>27,624</td>
<td>-74,149</td>
<td>-44,241</td>
</tr>
<tr>
<td>1936</td>
<td>0.05</td>
<td>-0.01</td>
<td>-2,384</td>
<td>22,403</td>
<td>-37,956</td>
<td>-13,169</td>
</tr>
</tbody>
</table>

### Simulation III

*The Labour Markets Effects of Remaining on the Gold Standard, 1931-1936*

<table>
<thead>
<tr>
<th>Year</th>
<th>Real Wages (%)</th>
<th>Hours (%)</th>
<th>Employment</th>
<th>Domestic Labour Supply</th>
<th>Foreign Labour Supply</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931</td>
<td>0.46</td>
<td>-0.63</td>
<td>-32,390</td>
<td>-12,387</td>
<td>-1,147</td>
<td>18,856</td>
</tr>
<tr>
<td>1932</td>
<td>1.94</td>
<td>-3.38</td>
<td>-177,310</td>
<td>-74,200</td>
<td>-9,806</td>
<td>93,304</td>
</tr>
<tr>
<td>1933</td>
<td>1.66</td>
<td>-5.17</td>
<td>-342,232</td>
<td>-148,404</td>
<td>-43,533</td>
<td>150,295</td>
</tr>
<tr>
<td>1934</td>
<td>1.48</td>
<td>-5.37</td>
<td>-504,051</td>
<td>-190,052</td>
<td>-109,855</td>
<td>204,144</td>
</tr>
<tr>
<td>1935</td>
<td>1.59</td>
<td>-6.00</td>
<td>-573,051</td>
<td>-224,852</td>
<td>-159,042</td>
<td>190,042</td>
</tr>
<tr>
<td>1936</td>
<td>0.87</td>
<td>-4.89</td>
<td>-581,698</td>
<td>-204,498</td>
<td>-209,671</td>
<td>167,529</td>
</tr>
</tbody>
</table>

### Simulation IV

*The Labour Markets Effects of Increased Unemployment Benefits, 1932-1936*

<table>
<thead>
<tr>
<th>Year</th>
<th>Real Wages (%)</th>
<th>Hours (%)</th>
<th>Employment</th>
<th>Domestic Labour Supply</th>
<th>Foreign Labour Supply</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1932</td>
<td>1.83</td>
<td>-0.10</td>
<td>-26,837</td>
<td>-16,129</td>
<td>1,965</td>
<td>12,864</td>
</tr>
<tr>
<td>1933</td>
<td>2.67</td>
<td>-0.32</td>
<td>-54,992</td>
<td>-36,271</td>
<td>1,299</td>
<td>29,020</td>
</tr>
<tr>
<td>1934</td>
<td>3.21</td>
<td>-0.47</td>
<td>-83,178</td>
<td>-50,953</td>
<td>-4,725</td>
<td>27,500</td>
</tr>
<tr>
<td>1935</td>
<td>3.50</td>
<td>-0.58</td>
<td>-103,657</td>
<td>-61,932</td>
<td>-11,793</td>
<td>29,932</td>
</tr>
<tr>
<td>1936</td>
<td>3.39</td>
<td>-0.64</td>
<td>-116,842</td>
<td>-66,851</td>
<td>-19,584</td>
<td>30,407</td>
</tr>
</tbody>
</table>
The second set of simulation highlights the role of public policy in the continuation of the economic crisis. This is particularly true of the adherence to the Gold Standard until September 1936, as has been suggested by Eichengreen and Sachs (1985). The very large effect that this policy had upon unemployment is clear from Table 2: by 1934 its impact in increasing unemployment was greater than the unemployment reduction attributable to the previous two policies combined. By this same year, it was more effective in reducing the foreign labour force through the creation of additional unemployment than the repatriation drive itself. While a wider model of the macro-economy may be needed to properly quantify the overall effects of changes in the exchange rates on the labour market, the magnitude of the effects on unemployment in

<table>
<thead>
<tr>
<th>Year</th>
<th>Real Wages (%)</th>
<th>Hours (%)</th>
<th>Employment</th>
<th>Domestic Labour Supply</th>
<th>Foreign Labour Supply</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1937</td>
<td>8.01</td>
<td>-14.26</td>
<td>74,381</td>
<td>31,330</td>
<td>1,353</td>
<td>-41,698</td>
</tr>
<tr>
<td>1938</td>
<td>8.98</td>
<td>-17.28</td>
<td>23,566</td>
<td>-35,326</td>
<td>38,844</td>
<td>-20,048</td>
</tr>
</tbody>
</table>

Simulation VI

The Labour Markets Effects of the Devaluation of the France, September 1936-1938

<table>
<thead>
<tr>
<th>Year</th>
<th>Real Wages (%)</th>
<th>Hours (%)</th>
<th>Employment</th>
<th>Domestic Labour Supply</th>
<th>Foreign Labour Supply</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1936</td>
<td>-0.22</td>
<td>0.29</td>
<td>13,123</td>
<td>5,369</td>
<td>323</td>
<td>-7,431</td>
</tr>
<tr>
<td>1937</td>
<td>-2.94</td>
<td>3.88</td>
<td>178,735</td>
<td>74,745</td>
<td>5,977</td>
<td>-98,013</td>
</tr>
<tr>
<td>1938</td>
<td>-5.37</td>
<td>9.38</td>
<td>473,066</td>
<td>216,567</td>
<td>35,928</td>
<td>-220,571</td>
</tr>
</tbody>
</table>

Note: The figures provided are relative to the following base simulations:
Simulation I – the ratio of public expenditure to GDP is maintained at the 1929 level of 3%;
Simulation II – the remigration rate for 1931-1935 is set at 5.13%, the mean level for the years 1919-1930;
Simulation III – the Franc is pegged to a basket of trade-weighted currencies at the 1930 rates of exchange;
Simulation IV – the replacement ratio is maintained at its 1931 level of 0.30;
Simulation V – the standard hours of work is maintained at 48 hours per week;
Simulation VI – the Franc is pegged to a basket of trade-weighted currencies at the 1935 rates of exchange.

The second set of simulation highlights the role of public policy in the continuation of the economic crisis. This is particularly true of the adherence to the Gold Standard until September 1936, as has been suggested by Eichengreen and Sachs (1985). The very large effect that this policy had upon unemployment is clear from Table 2: by 1934 its impact in increasing unemployment was greater than the unemployment reduction attributable to the previous two policies combined. By this same year, it was more effective in reducing the foreign labour force through the creation of additional unemployment than the repatriation drive itself. While a wider model of the macro-economy may be needed to properly quantify the overall effects of changes in the exchange rates on the labour market, the magnitude of the effects on unemployment in
simulation III relative to those of the other simulations in Table 2 shows that even from this partial equilibrium analysis, the adherence to the Gold Standard beyond 1931 was a major factor in the delayed recovery of the French economy.

Ever since the controversial hypothesis that a significant proportion of unemployment in interwar Britain could be attributed to the generosity of the unemployment compensation system was put forward by Benjamin and Kochin (1979), no study of interwar unemployment has been able to ignore the possible relation between unemployment compensation and the level of unemployment itself. Thus the effect of the raising of unemployment benefits in 1932 needs to be considered as it resulted in benefits being 40% higher than they would have been in the counterfactual case.

Despite this large real increase in benefit levels, the results in Table 2 suggest that its effects on the labour market was fairly small. It does appear to have had some effect on real wages, and thus on unemployment, but not in raising labour supply as would have been expected. Its total effect on unemployment is necessarily small.

Turning to the Popular Front years, the evidence of the economic recovery is provided by the prediction that in the absence of the 40-hour week, the length of the average working week would have recovered to within one half-hour of the standard 48-hour level by 1938. The limited effect on unemployment is consistent with the results of the labour services sub-model of the previous section, though it would appear from Table 2 that incumbent workers benefited far more from the 40-hour week than did ‘outsiders’; the rise in hourly real wages was much greater
than the increase in employment, a consequence of the productivity effect upon prices cited earlier.

The relative movement of domestic and foreign workers into the labour market following the 40-hour week is unexpected though. While both groups of workers enter the labour market to a greater degree in 1937 as a result of the hours reduction, it seems perverse that a significant number of domestic workers should leave the labour market the following year. The result appears to arise from the prediction that the labour utilisation rate in 1938 is actually higher in the 48-hour week counterfactual than in the 40-hour week situation that existed in that year, having been the opposite way around the year before. This despite the lower unemployment from the 40-hour week, the re-emergence of short-time working in 1938 signals a slackness on the labour market which leads to ‘discouraged’ domestic workers leaving the labour market at the same time that foreign workers return to France after the election of the Popular Front. Nevertheless, the movement of total labour supply is very much in line with expectation.

The labour market effects of the devaluation of the Franc in September 1936 are also very line with expectation. In the absence of this devaluation, unemployment would have continued to rise and reach an interwar peak of over one million in 1938, while the average working week would have fallen to 36.7 hours, a degree of short-time working that would have exceeded that of 1932.

In turn, as Villa (1993) has argued, the devaluation of the Franc relaxed the demand-side constraint on prices and so allowed employers the room to raise prices to more than compensate for the increase in unit labour costs in 1936-1938. The decision to devalue the Franc was

21 Given the figures produced by Carlier (1985), it may be deduced that the large majority of the returning foreign workers were Algerian.
therefore the most successful of the Popular Front’s policies even though it was not a pre-
determined policy.

4. Conclusions

Thus paper has attempted to construct an empirical model of the French interwar labour market
that could be used to simulate the labour market effects of a number of public policies in the
1930s. This objective necessitated estimating equations with a large number of explanatory
variables with respect to the number of observations available. This leaves the statistical
foundations of the results in some doubt, but alternatives have been few for the statistical
analysis of this historical period. The model, with extra equation to capture the specificity of the
interwar French labour market, provides sensible results and appears to be able to simulate the
unemployment series particularly well.

The results from these simulations confirm previous findings that continued adherence to the
Gold Standard prolonged a country’s economic crisis in the 190s. With regard to the active
labour market policies adopted by the various French governments of the early 1930s, both the
repatriation drive and the public works programmes (proxied by the counter-cyclical public
expenditure) appear to have had short-run effects in reducing unemployment, but these were
negated by the effects of remaining on the Gold Standard and in the longer-run even the ability
of the repatriation drive to artificially reduce the size of foreign labour force is called into
question. Similarly, the 40-hour week was found to have only a very limited effect upon
unemployment. The hoarding of labour which was so prevalent until the reduction of hours can
account for part of this dampened effect, but it has also been shown that employer opposition to
the policy played its part through the sluggish move of average hours to the new standard.

The concerns over the statistical weaknesses aside, the final verdict on French unemployment in the 1930s is that the potential effectiveness of government policy was fairly large: a withdrawal from the Gold Standard in 1931 would have reduced unemployment by up to a quarter. But the external constraints of employer opposition to the foreign worker and 40-hour week policies and the internal constraints of a lack of policy co-ordination rendered much of the policies to reduce unemployment in 1930s ineffective in aggregate.
5. References


Salais, R. (1988). ‘Why was Unemployment so Low in France During the 1930s?’ in *Interwar*
Unemployment in International Perspective (eds. B. Eichengreen and T.J. Hatton), Dordrecht, Kluwer.


6. Data Appendix

The time-series data used for the estimation and simulations in this paper are annual data on the period 1919-1939, for which the primary source is Villa (1993). If there is another data source for a variable, this is shown below. The data pertains to the aggregate economy-wide labour market, that is, it is inclusive of the agricultural, industrial and service sectors. As far as the economic agents under investigation are concerned, the data on employment and wages, for example, pertain only to wage-earners and not employers. Given the strict requirements for entitlement to unemployment assistance and thus for recognition as unemployed, it is consistent to model unemployment in terms of wage earners only. As a result, labour supply is also in terms of wage earners only.

The data definitions in alphabetical order are as follows:

CU  Capacity Utilisation Rate.
D  Domestic wage-earning labour supply. Calculated as L-F.
F  Foreign Labour Supply. Obtained from the population census data, with interpolation performed using the annual net migration flows.
H  Average hours of work per week.
H'  'Standard' (or legal) working week, in hours. [Source: Bulletin du Marché du Travail].
I  Total value of interests and dividends received by households.
K  Total capital stock at year end.
K*  Total capital services. Calculated as the product of the total capital stock (K) and the capacity utilisation rate (CU).

Total wage earning labour supply. Calculated as \( N + Un \).

Number of wage earners employed. The Villa series is corrected for the year 1928 (see Syme, 1997, chapter 4, for discussion).

Remigration Rate. Calculated as the ratio of involuntary repatriation and voluntary departures to the foreign population resident in France, where the foreign population is given by the census figures and interpolated using the foreign labour supply series. [Source: Bulletin du Marché du Travail].

The GDP price deflator.

Consumer Price level. Calculated as \( P \times (1 + t_3) \).

Foreign Consumer Price level. Calculated using annual weighted country averages as for the foreign nominal wage.

Price of imports.

Foreign prices. Calculated as weighted index of prices in Belgium, Britain, Italy, Germany, Switzerland and the USA, where the weights are derived from the volume of French exports to each country.

Total population in mid-year.

Population of working age (15-64). Calculated as \( POP \times \text{age\%} \), where \text{age\%} is the proportion of the population aged between 15 and 64 years. The variable \text{age\%} is obtained from the population census data, with interpolation between the census using a linear time trend.

Domestic Population in mid-year. Calculated from census observations with linear trend of domestic:foreign population ratio on \( (POP) \) for inter-census years.

Domestic Population of working age (15-64). Calculated as \( POP_d \times \text{age\%} \), where the proportion of the population aged between 15 and 64 years (\text{age\%}) is assumed not to vary from total population to domestic population.

Rate of return on private sector debentures.

The rate of employers' social security contributions.

Direct tax rate on employees.

Indirect tax rate.

Unemployment Rate. Calculated as \( \frac{Un}{L} \).

Foreign Unemployment Rate. Calculated using annual weighted country averages as for the foreign nominal wage [Source: Mitchell, 1983]

Number of persons unemployed (annual average).

Hourly nominal wage. The Villa series is corrected for the year 1928 where it is wrongly printed in his book (confirmed in private correspondence).

Foreign hourly nominal wage. Calculated as a weighted average of the hourly nominal wage in the countries of origin of the leading ten nationalities of
foreign workers in France in the interwar period: Belgians, Britons, Czechoslovaks, Germans, Hungarians, Italians, Poles, Rumanians, Swiss, and Yugoslavs. The annual weights are derived from the proportion of total foreign workers being of each nationality [Source: Mitchell (1983)]

$Y$  Gross Domestic Product, in real terms.

$z$  Ratio of Public Expenditure to GDP.