

Do recruitment difficulties help to explain recent wage trends in France?

The short-term forecast for average wage increases rests in particular on the link with inflation and the unemployment rate. For several years now, the business tendency surveys have been measuring more and more striking difficulties in recruiting in most sectors. These difficulties are likely to exert upward pressure on wages. Although a correlation – albeit weaker in the recent period – has effectively been established, it would seem that taking these recruitment difficulties into account in econometric equations does not significantly improve wage forecasting: these difficulties are correlated above all with the unemployment rate, which is already used as an indicator of tension.

The short-term analysis of wages provided in INSEE's *Conjoncture in France* publications rests mainly on their link with inflation and the unemployment rate

The mechanisms that shape wages involve a large number of determinants, both short-term and long-term: the level of, and increase in prices, the degree of qualification of jobs, collective bargaining mechanisms, the tax and benefit system or the level of unemployment. When measuring wages as part of the forecasting exercise carried out for the *Conjoncture in France* (over a maximum of one year), the main factors usually taken into account are inflation and the unemployment rate, as well as apparent labour productivity and growth in economic activity.

The short-term monitoring of wages in the non-farm market sectors carried out by INSEE in each quarter relies on two wage indicators: on the one hand, the basic monthly wage measured for a constant qualification structure by the Activity and Employment Status (ACEMO) survey, and, on the other hand, the average wage per capita, which beyond the basic wage, reflects changes in qualifications and in the amount of work, as well as situation-based components such as overtime and bonuses.

Forecasting the basic monthly wage

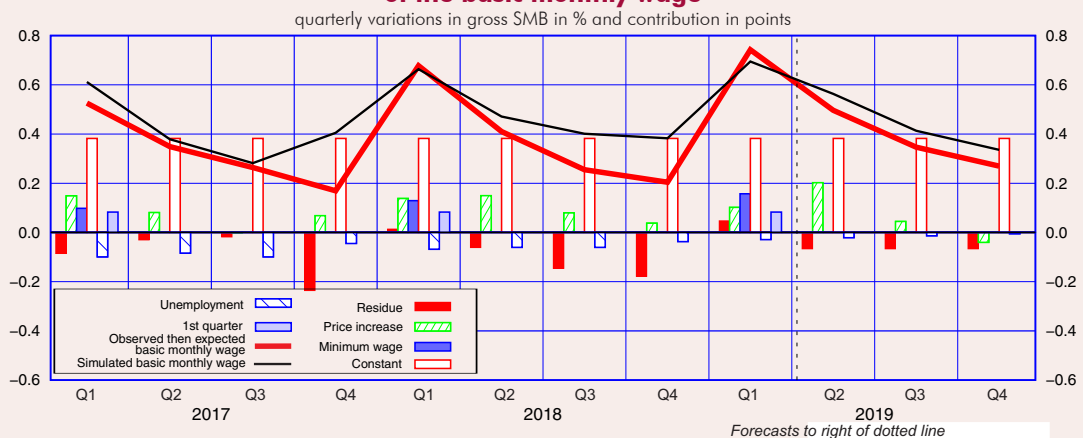
The models used to forecast the basic monthly wage rely on the usual determinants - inflation, the unemployment rate and the minimum wage.

The main model used for the basic monthly wage forecasting exercise is a log-linear model based on the dependent variables in wage trends in relation to these determinants (*model 1*):

$$(1) \quad \Delta \ln(SMB)_t = \underset{(0,0005)}{0,004} + \underset{(0,04)}{0,142} \Delta \ln(IPC)_t - \underset{(0,05)}{0,017} \Delta \ln(IPC)_{t-2} + \underset{(0,05)}{0,122} \Delta \ln(IPC)_{t-3} \\ + \underset{(0,05)}{0,206} \Delta \ln(SMIC_{<1998t4})_{t-1} + \underset{(0,01)}{0,077} \Delta \ln(SMIC_{\geq 1998t4})_t \\ - \underset{(0,02)}{0,078} (tcho_t - tcho^*_{moyenne\ 1991-2018}) + \underset{(0,001)}{0,003} T1_{<1998t4} + \underset{(0,001)}{0,001} T2_{<1998t4} + \underset{(0,001)}{0,003} T1_{\geq 1998t4}$$

Estimation period: 1985-2018

1 - Contributions of the explanatory variables in the modelling of the quarterly progression of the basic monthly wage



Scope: France excluding Mayotte, establishments with 10 employees or more in the non-farm market sectors

Note: forecasts beyond the dotted line. Over the estimation period of the model, the calibration corresponds to the residual, that is, the spread between the quarterly variations observed and predicted by the model. In forecasting the wage is obtaining by assuming a calibration equal to the average of the three last years.

Source: DARES, survey Acemo; INSEE

French developments

In this model, inflation is introduced as an explanatory variable in the current quarter t , and for the previous quarters, in order to take into account the time needed for wages to adapt to price increases. The unemployment rate ($tcho$) reflects the status of job market tensions. The minimum wage is integrated into the model by estimating its impact before and after the last quarter of 1998 separately, in order to take account of the change in the periodicity of the measurement of the basic monthly wage in the ACEMO survey at that date. Finally, dummies are added into the model for the first two quarters (Q1 and Q2) to neutralise the seasonality of the price and wage variables (here non-seasonally adjusted).

This model slightly overestimates the quarterly variation in the basic monthly wage over the last three years, by an average of 0.1 points per quarter (Figure 1).

Forecasting the average wage per capita

Insofar as it includes overtime and bonuses as well as the basic wage, the average wage per capita is more sensitive to cyclical fluctuations in economic activity. Calculated as part of the preparation of the quarterly accounts, it is corrected for seasonal variations (CSV). The exercise of analysing and forecasting the average wage per capita in INSEE's Conjoncture in France rests on the estimation of different econometric models.

One of the models used includes, as well as inflation (delayed by only one quarter, therefore assuming a rapid adjustment of wages to price rises), apparent labour productivity (PW), which links GDP to the volume of work necessary to produce it, and the unemployment rate. The effect of apparent labour productivity is evaluated separately before and after the first quarter of 2009 to take account of the greater elasticity of wages in terms of this measurement since the crisis (model 2):

$$(2) \quad \Delta \ln(SMPT_{CVS})_t = 0,006 + 0,151 \Delta \ln(IPC_{CVS})_{t-1} + 0,238 \Delta \ln(PW)_{t < 2009:1} + 0,355 \Delta \ln(PW)_{t \geq 2009:1} - 0,167 (tcho_t - tcho^*_{moyenne\ 1991-2018})$$

(0,001) (0,09) (0,06) (0,10) (0,03)

FORMULA

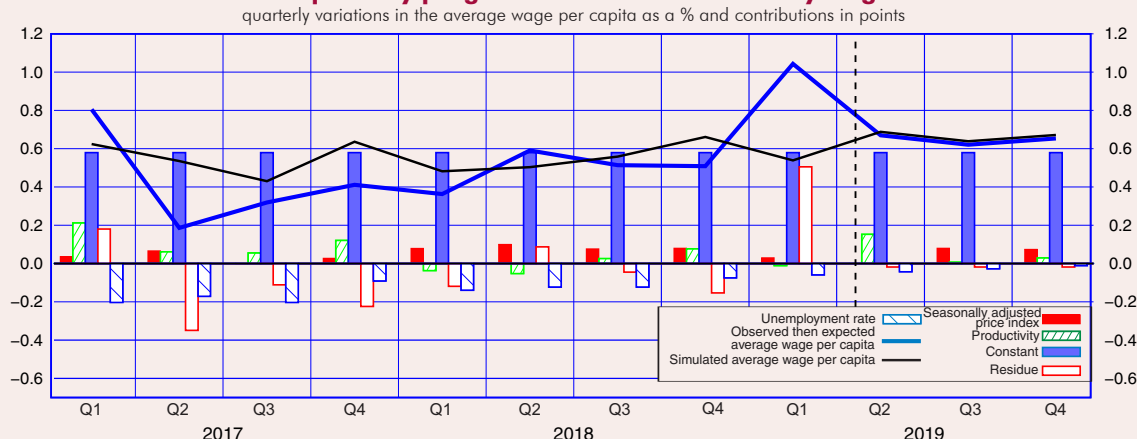
Estimation period: 1991-2017

Since the beginning of 2017, this model has slightly overestimated increases in the average wage per capita (Figure 2).

Recruitment difficulties: a link to wages... but no new information on top of that provided by the unemployment rate

The difficulties that employers experience in hiring workers are measured on a quarterly basis in INSEE's business tendency surveys. In the same way as the unemployment rate, to which they are strongly linked (when the unemployment rate falls, recruitment difficulties increase), they constitute a relevant indicator of labour market tensions (Figure 3).

2 - Contributions of the explanatory variables in the modelling of the quarterly progression of the basic monthly wage



Scope: France, non-farm market sectors

Note: forecast beyond the dotted line. The interpretation of the calibration is similar to the forecasting exercise for the basic monthly wage (Figure 1).

Source: INSEE, quarterly national accounts

Faced with recruitment difficulties, companies may increase wage levels to retain their employees or attract new ones. In this case, the latter have increased wage bargaining power. When recruitment difficulties increase, wages generally become more buoyant (Figure 4). However, the rise in wages has remained contained since 2015, even though recruitment difficulties rose sharply again at the end of 2018 to reach their highest level for 10 years - a level comparable to that of 2008.

To evaluate the influence of recruitment difficulties on wages, first of all we can estimate directly the linear correlation between the average wage per capita and the difficulties experienced by employers by testing a difference in the link since 2015 (3):

$$(3) \quad \Delta \ln(SMPT)_t = 0,00015 + 0,0089 drec_{t \geq 2015} + 0,0146 drec_{t < 2015}$$

(0,001) (0,005) (0,003)

Estimation period: 1991-2017

The two factors estimated to be associated with recruitment difficulties are positive and significant, with the one corresponding to the recent period being significantly lower than the other, which reflects a weakening of the link between wages and recruitment difficulties.

Secondly, it is useful to test whether recruitment difficulties provide any extra information on top of the usual determinants and, in particular, the unemployment rate, information which could then improve the analysis of wages.

To do this, an extra variable is tested, "innovation" in recruitment difficulties, measured here as the component in recruitment difficulties that is not explained by the unemployment rate (i.e. the regression residual explaining the former by the latter)

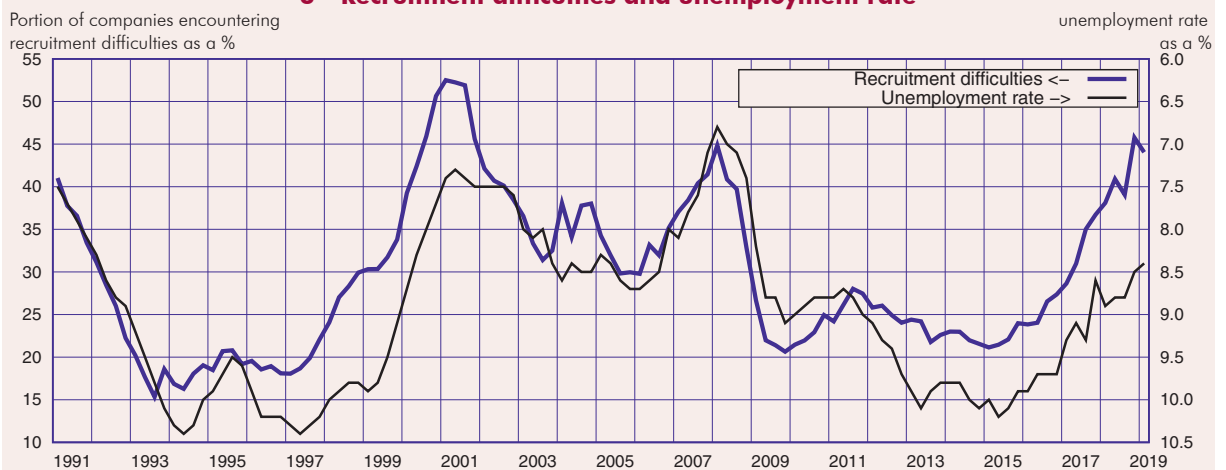
In all the models used to forecast wages for the purposes of Conjoncture in France, the addition, among the explanatory variables, of the innovation variable on top of unemployment has not been conclusive: while the unemployment rate remains significant (at the 5% threshold) in the models where it is used, this is never the case for innovation in recruitment difficulties. In particular, for the basic monthly wage, the model presented in part 1 leads to the following estimated equation:

$$(4) \quad \Delta \ln(SMB)_t = 0,004 + 0,139 \Delta \ln(IPC)_t - 0,018 \Delta \ln(IPC)_{t-2} + 0,106 \Delta \ln(IPC)_{t-3} + 0,102 \Delta \ln(SMIC_{<1998t4})_{t-1} + 0,078 \Delta \ln(SMIC_{\geq 1998t4})_t - 0,080 (tcho_t - tcho^*_{moyenne\ 1991-2018}) + 0,003 T 1_{<1998t4} + 0,001 T 2_{<1998t4} + 0,003 T 1_{\geq 1998t4} - 0,005 innovationDR$$

(0,0005) (0,04) (0,05) (0,05) (0,05) (0,05) (0,01) (0,006) (0,03)

Estimation period: 1985-2017

3 - Recruitment difficulties and unemployment rate



Note: in the service sector, recruitment difficulties have only been measured since the third quarter of 2000. The indicator for the non-farm market sectors over the period 1991-2000 was therefore obtained by backcasting based on the business tendency surveys for the building sector and industry. The unemployment rate scale is reversed.

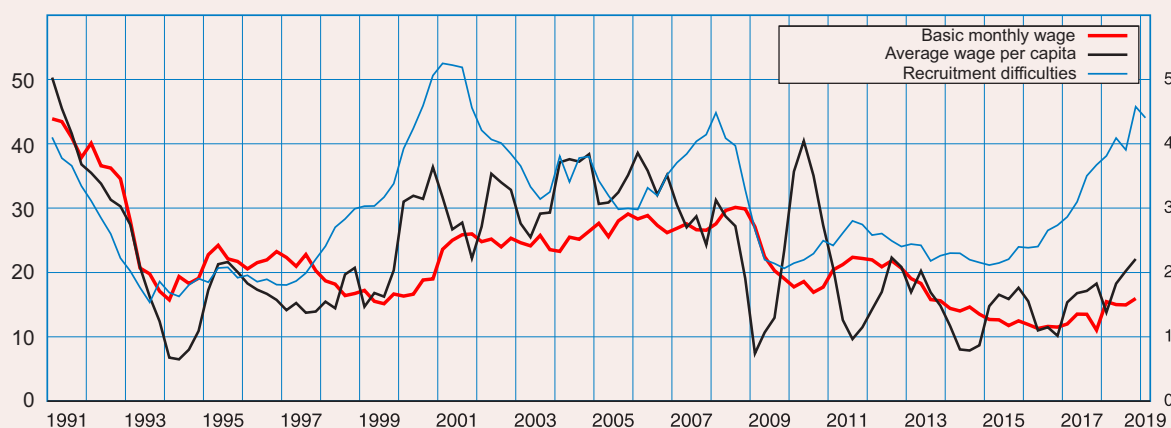
Source: INSEE, Labour force and business tendency surveys

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Thus, although recruitment difficulties are manifestly correlated with increases in wages, they do not provide any extra information on top of the unemployment rate which could improve the short-term analysis. This diagnosis remains valid when this analysis is applied to all the main sectors of activity and to each occupational category. ■

4 - Recruitment difficulties and year-on-year wage increases

recruitment difficulties as a %/year-on-year wage increase as a %



Scope: France for the average wage per capita; France excluding Mayotte for the basic monthly wage and Metropolitan France for recruitment difficulties; non-farm market sectors, restricted to establishments with 10 employees or more for the basic monthly wage

Source: INSEE, business tendency surveys and national accounts base 2014; DARES, ACEMO survey

Bibliography

V. Passeron and F. Romans, (2002), "Forecasting wage trends in France", *Conjoncture in France* March, INSEE. ■