Will the recovery be jobless?

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In the year to Q3 2003, dependent employment in the competitive sector fell by only 0.1%, whereas market value added fell by 0.4%, showing that employment had to some extent withstood an adverse economic situation. Whether measured in hourly terms or per head, apparent labour productivity has therefore slowed down substantially since the beginning of the year, growing much more slowly than its long-period average. In period of upturn, there should be a symmetrical increase in productivity in coming quarters : with the adjustment in employment normally lagging behind the economic cycle, it would slow in picking up again. This special article throws light on the question of the link between growth and employment, by trying to take into account as well as possible the number of hours worked and the various measures to increase the job content of growth. It therefore tackles the question of the forecasting of employment levels with the aid of new instruments that forecast that employment is set to grow only modestly - by 0.1% per quarter during the next half-year.
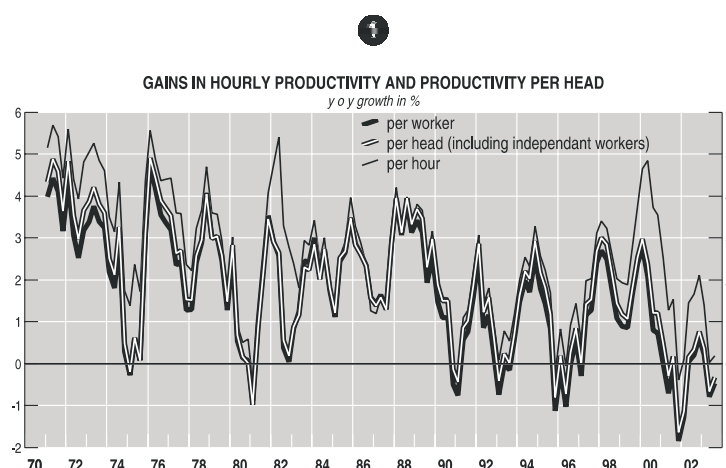
During the past 10 years, apparent labour productivity in sectors that are essentially competitive has risen by 0.8% a year on average, whereas in the previous 20 years the figure was 2.0% *(see graph 1)*. This increase in the job content of growth is a complex phenomenon. One part can be considered as representing an underlying trend, capable of being interpreted in many different ways. One interpretation that is frequently discussed is that it reflects the ending of a period of catching up with production conditions in the American economy, pending a further surge due to the backlog accumulated during the 1990s in terms of information and communication technology. Another factor that has been much studied is the slowdown in the accumulation of capital per head; the growing "tertiarisation" of the economy, in other words the greater specialisation by France in the sectors least liable to show productivity gains is also often put forward as an explanation.

This increase in the job content of growth may also have had its origins in the numerous policy initiatives regarding employment taken in the 1990s. Mention can be made,

in no particular order, of the cuts in social insurance contributions for the lower-paid, the expansion of part-time working, but also the statutory reduction in working hours and the wide range of policies targeted on assisting employment.

For the short term, a model of employment that ignores these phenomena and takes as given the decline in productivity can have satisfactory forecasting power. This was the option taken by Gonzalez-Demichel et al. [2000]. However, for one thing this solution does not satisfy the economic interpretation one would like to make and, for another, it risks ignoring a rapid return to a situation with little or no increase in the job content of growth attributable to these policies.

It would seem important, in fact, to take into account the induced effects of the various arrangements on labour productivity in order to comprehend and correctly predict the evolution of employment in the short to medium term. This special article reviews the various elements liable to shed light on the forecasting of employment levels,

GAINS IN HOURLY PRODUCTIVITY AND PRODUCTIVITY PER HEAD
y o y growth in %

— per worker
— per head (including independant workers)
— per hour

using a long-period macroeconomic equation but also with the help of short-term business surveys.

Apparent labour productivity slowed down in the early part of the 1990s

The slowdown in productivity was particularly visible in the case of the apparent productivity of dependent employment *(see table 1)*. This concept, the one most frequently used, is obtained as the ratio of value added to the dependent workforce in the sectors concerned. Several explanations for this slowdown can be put forward.

One is that the continuous decline in independent employment tends to introduce a negative bias into the evaluation of productivity. Independent workers accounted for 15.1% of employment in the non-farm market sectors in 1970, 12.5% in 1990 and only 9.9% in 2000 *(see graph 2)*. It is therefore necessary to take proper account of all individuals contributing to the type of production concerned. Furthermore, the expansion of part-time working and the reduction in working hours have contributed to a reduction in the average duration of work and so affected productivity per head but have not led to a deterioration in productivity per hours worked - quite the contrary *(see graph 3 and table 1)*.

However, the "working time" effect is insufficient to explain the slowdown in productivity. Even after taking into account the length of working time, productivity is shown to have grown more slowly in the last 10 years than in the preceding period *(see table 1)*. This means that the analysis of evolutions in the job content of growth have to take account of evolutions in hourly labour productivity and in working time as well as of possible interactions between the two. But it also has to take account of a possible increase in the job content of growth in the past 10 years or so.

TABLE 1: BREAKS IN THE EVOLUTION OF LABOUR PRODUCTIVITY ACCORDING TO DIFFERENT CONCEPTS
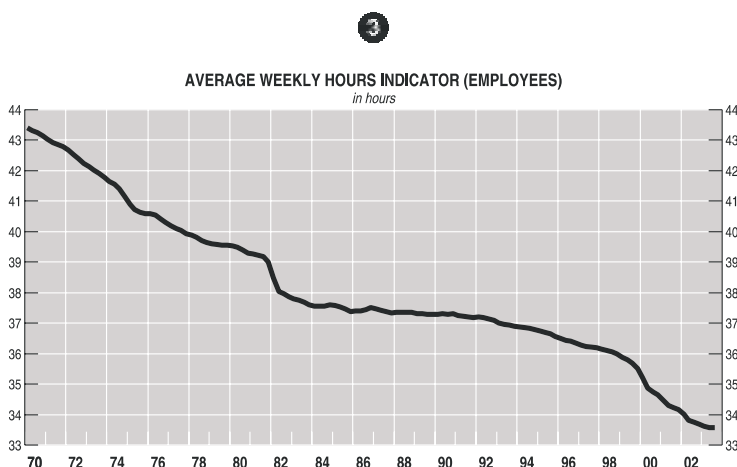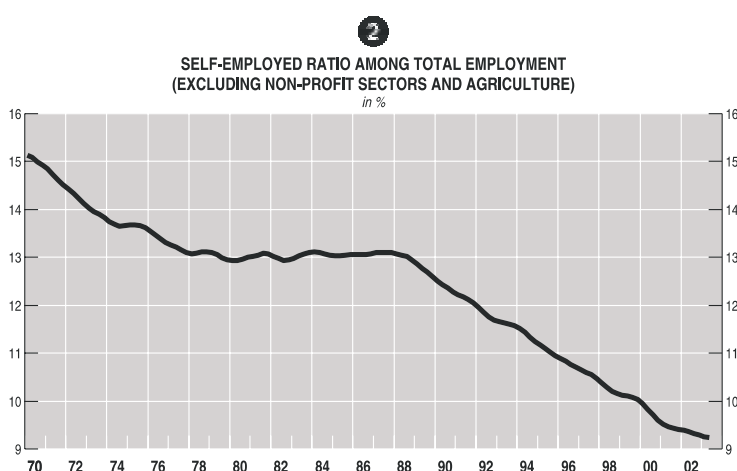
(Growth expressed as annual averages)

	1979-1992	1993-2002	of which 2001-2002
Apparent dependent-worker productivity (1)	1.8	0.8	-0.4
Apparent labour productivity per head, including independent workers (2)	1.9	1.1	-0.1
Hourly productivity, including independent workers (3)	2.4	2.0	1.3
Contribution from working time (4)=(3)-(2)	0.5	0.9	1.4

Coverage: non-farm principally competitive sectors.

How to read the table:
Taking independent workers into account (2), trend growth in productivity fell from 1.9% between 1979 and 1992 to 1.1% starting in 1993, this decline of 0.8 of a point being smaller than in the case of the apparent productivity of dependent workers alone ((1), -1.0 of a point); in the case of working time (4) this is teh accounting contribution to hourly productivity.

②

SELF-EMPLOYED RATIO AMONG TOTAL EMPLOYMENT (EXCLUDING NON-PROFIT SECTORS AND AGRICULTURE)
in %

③

AVERAGE WEEKLY HOURS INDICATOR (EMPLOYEES)
in hours

Taking into account employment policies and their impact on the cost of labour

This increase in the job content of growth is often linked to the impact of policies aimed at reducing the cost of labour. Arrangements for assisting employment in the market sector, whether general or concentrated on the lower-paid (rebate on the lower wages since 1993 followed by the so-called "Fillon" reductions since July 2003) or targeted on certain members of the labour force (for example the so-called "employment initiative

INSEE

LEGAL DECISIONS IMPACTS ON HOURLY PRODUCTIVITY
in %
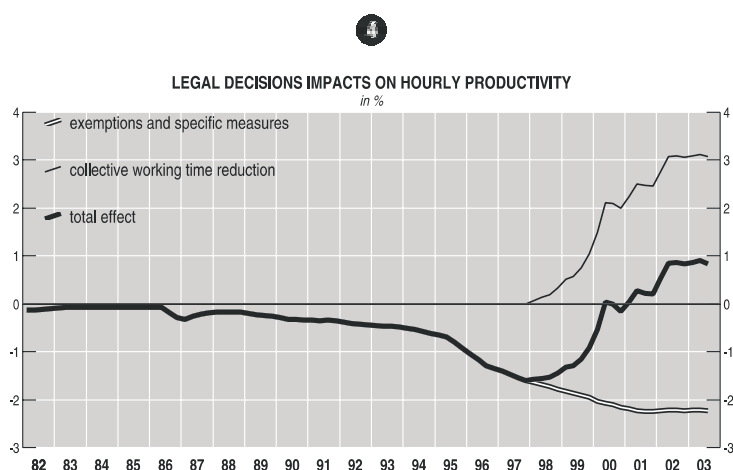
contracts" since 1995) have indeed helped to modify the relative cost of unskilled labour in relation both to capital and unskilled labour. This has been reflected in a rise in unskilled employment and hence in a temporary decline in hourly productivity or productivity per head.

These modifications affecting growth in hourly productivity do not reveal a lasting decline in its potential. If working time and the relative cost of unskilled workers stabilise, productivity should return to higher growth rates. It is therefore necessary to be able to capture the impact of the cost of labour, as well as that of working time, in order to improve the forecasting of employment in the short and medium term.

It is possible to consider a production function for two types of employment, skilled and unskilled,

and by using econometric methods establish the link between the declines in the cost of labour that normally involve workers paid close to the minimum wage, on the one hand, and evolutions in employment, on the other. This is the specification chosen, for example, by Baron et al. (2003). However, information on the relative cost of skilled and unskilled workers is not available for periods of less than one year, meaning that it cannot be used as such for short-term forecasting exercises.

The direct introduction of variables representing the cost of labour or duration of working time in an econometric equation of employment is fairly unsatisfactory, as the various estimates seem to be over-dependent on the reference period. In the equation adopted here, it was therefore judged to be preferable to directly introduce *ad hoc* estimates of the effects of the

various measures on employment *(see box 1)*. The aim is not to compare the effects of the different employment policies, which have in any case frequently been assessed in various studies, normally on the basis of microeconomic data that are not directly comparable, if only because of the methods used *(see box 2)*. The aim here is to take account of the orders of magnitude on which there is general consensus, in order to obtain a better estimate of the link between "spontaneous" employment and activity, in other words to have a better understanding of the trend and short-term evolutions in hourly labour productivity that would have been observed in the absence of these policies. Some of these orders of magnitude are subject to revision, meaning that the effects introduced here have a provisional character. This could be particularly the case for the effects of the arrangements for the reduction in working hours - the so-called RTT.

Table 2 shows the evolutions in hourly productivity for three distinct periods, while graph 4 shows the effects adopted for the various employment policies on hourly productivity. The specific measures and the exoneration from social insurance contributions have had a declining negative impact on hourly productivity throughout the period. The reduction in working hours had a negative effect on productivity per head and a positive impact on hourly productivity particularly in the period from end-1999 to early-2000 when most firms employing more than 20 people moved to the 35-hour week. There was also a noticeable impact, but on a smaller scale, between end-2001 and early-2002.

TABLE 2: HOURLY PRODUCTIVITY ADJUSTED FOR THE VARIOUS POLICIES

	(Growth expressed as annual averages)		
	1979-1992	1993-2002	of which 2001-2002
Hourly productivity(1)	2.4	2.0	1.3
Hourly productivity adjusted for specific policies and general exonerations (2)	2.4	2.1	1.3
Hourly productivity adjusted for specific policies, general exonerations and the impact of RTT on productivity (3)	2.4	1.8	0.8

Coverage: non-farm principally competitive sections.

How to read the table:
In the period 1993-2002, hourly productivity (1) rose by 2.0% on average; in the absence of measures to reduce the cost of labour, the rise would have been 2.1% on average and these measures would have made an average negative contribution of 0.1 of a point per year (1)-(2); the hourly productivity gains emanating from RTT would have contributed an average of 0.3 of a point during these years (3)-(2).

The slowdown in recent years marks the procyclical nature of productivity

However, the above elements fail to explain more than a part of the productivity gains in the competitive sectors in recent quarters.

INSEE

In 2000 there were substantial annual gains in hourly productivity (4.2% on an annual average), accompanied notably by a sharp fall in working time (by 2.2%). In 2001, despite the continued decline in working time (by 1.5%), productivity growth weakened substantially (1.2%), with employment decelerating only slowly in relation to activity. Hourly productivity even showed a year-on-year fall in the last part of the year (down 0.4%).

The fact is that employment adjusts only after a delay to variations in production. In periods of slowdown, neither employment nor hours worked fall immediately as fast as production *(see graph 5 and 6)*. This is what is described in classic theory as the labour productivity cycle and can be interpreted with the chosen macroeconomic equation. When the economic situation worsens, firms tend initially to hold onto their workforce in order not to pay the costs of layoffs and subsequent costs of recruitment and training in a more positive phase of the cycle. When the situation improves, firms prefer first of all to increase the intensity of utilisation of labour pending confirmation of the recovery.

Hourly productivity growth remained small in 2002 (1.3%). In the early part of the year, the upturn in activity left room for large short-term productivity gains, while employment continued to slow down. However, the recovery was not subsequently confirmed and activity weakened substantially in the second part of the year, even more than employment. Productivity growth also remained below its long-term trend

The early part of 2003 saw activity still declining, especially in the competitive non-farm sectors - at an annual rate of 1% in H1. Over the same period, hourly productivity gains were zero overall. As a result, the number of hours worked fell at an annual rate of 1%, with the continued reduction in hours worked (by 0.6% at annual rate during the half-year) being the main contributor, whereas employment weakened only slightly.

While the employment equation adopted satisfactorily reflects the slowdown in 2001 and the hourly productivity gains in the first part of 2002 (year on year, contribution of residuals of 0.1% at end-2001 and mid-2002), the comparative evolutions in activity and employment since then appear to be unusual in relation to the modelling adopted. A dynamic simulation using the equation suggests an evolution in employment over one year that would be 0.4 of a point smaller than that actually observed in Q3 2003. In other words, in the past year it is difficult to explain the evolutions in hourly productivity in terms of the usual determinants.

⑤

PRODUCTION, WORKING HOURS AND EMPLOYMENT
y o y growth, in %

Coverage : non-farm principally competitive sectors

⑥

PRODUCTIVITY AND PRODUCTION
y o y growth, in %

The expected upturn in activity should benefit employment to some extent, and mainly contribute to a return to more usual productivity growth rates

It is therefore probably in a context of workforce retention on a greater scale than indicated by the equation that recent quarters have to be considered. Working time is gradually stabilising with the end of the move to the 35-hour week. Production rose appreciably in Q3 2003, whereas employment declined only very slightly. Firms achieve hourly productivity gains that are closer to the long-term rate.
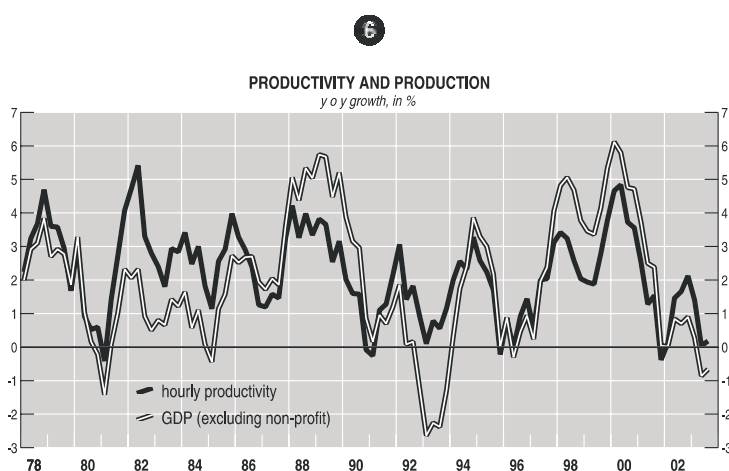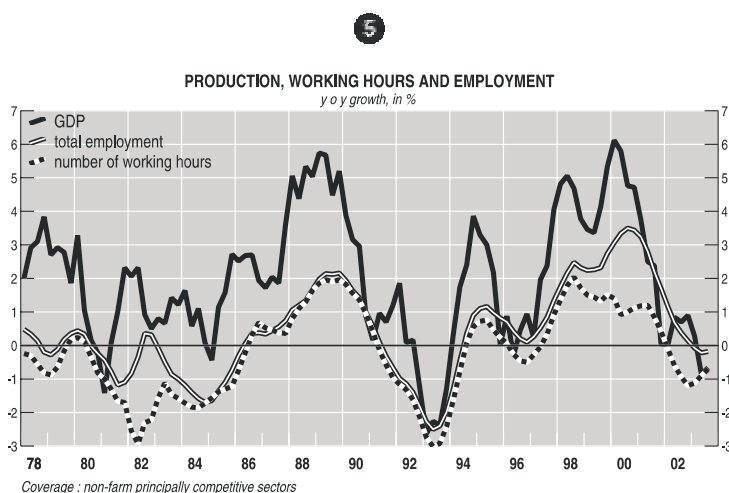
TABLE 3: GROWTH AND EMPLOYMENT

(in %)

	Growth expressed as annual averages				Growth expressed as quarterly averages							
					2002		2003				2004	
	2000	2001	2002	2003	Q3.	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Non-farm competitive sector GDP, excluding real estate (1)	**5.3**	**2.1**	**0.6**	**-0.2**	**0.1**	**-0.5**	**0.0**	**-0.5**	**0.3**	**0.6**	**0.8**	**0.5**
Productivity per head	1.9	-0.3	0.0	0.0	0.2	-0.5	0.1	-0.4	0.3	0.6	0.8	0.4
Hourly productivity (2)	**4.2**	**1.2**	**1.3**	**0.7**	**0.4**	**-0.3**	**0.2**	**-0.2**	**0.4**	**0.7**	**0.8**	**0.4**
Number of hours worked (3)=(1)-(2)	1.1	0.9	-0.7	-0.9	-0.2	-0.2	-0.2	-0.3	0.0	0.0	0.0	0.1
Working time (4)	-2.2	-1.5	-1.3	-0.6	-0.2	-0.2	-0.1	-0.2	0.0	0.0	0.0	0.0
Total employment (dependent + independent) (5)=(4)-(3)	**3.3**	**2.5**	**0.6**	**-0.2**	**0.0**	**0.0**	**-0.1**	**-0.1**	**0.0**	**0.0**	**0.1**	**0.1**
Dependent employment in non-farm competitive sectors.	3.7	2.8	0.7	-0.1	0.0	0.1	0.0	-0.1	0.0	0.0	0.1	0.1

Coverage: non-farm principally competitive sectors.

Forecast

During the next quarters, the relaxation of the rules governing overtime should enable firms to intensify their production processes, notably in manufacturing. If growth in activity is confirmed, production would as a result grow faster than employment, enabling firms to restore margins eroded by the slowdown in the past quarters.

As a result, employment can be expected to increase again in coming quarters, with only a very gradual acceleration. The contributions of different variables to growth in employment would all be small in the early part of next year. Indeed, the contribution of the working time would become practically nil, while that of the various arrangements for assisting employment in the market sector would grow only very slightly with the build-up of the "minimum income from activity" (RMA) and the diffused effects of the general exonerations from social insurance contributions since Q3 2003. Allowing for the usual lag between the respective upturns in activity and employment, and the need for firms to restore a certain level of margins, dependent employment is likely to increase only by of the order of 0.1% per quarter between now and mid-2004. This would mean that it would not return to the substantial growth rates seen until 2001. In so doing, hourly productivity would return to an annual growth rate of the order of 2 to 2 ½% in the coming half-year. ∎

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BOX 1: THE ECONOMETRIC EQUATION USED FOR THE ANALYSIS

The principle of the macroeconomic employment equation used in this special report is based on the link between the number of hours worked and the value added in the non-farm and principally competitive branches. The estimation is carried out in two stages: one dealing with the long term, which describes the trend in hourly labour productivity; one dealing with the short term, which sets out in detail how hours worked adjust in relation to this long term, notably as a function of variations in activity.

The long-term equation

The principle underlying the long-term equation is to model the trend rise in apparent labour productivity. Whether calculated per head or in hourly terms, apparent labour productivity has constantly slowed down since the beginning of the 1970s.

In practice, there were several possible options. One might, for example, have adopted a linear trend for hourly productivity, in order to capture the steady decline in productivity gains (see Lerais [2001]). In that case, the equation takes the form:

$$LOG\,(VA\,/\,H) = LOG(\alpha + \beta t) + Other\ variables$$

where:
VA is the value added
H is the number of hours worked by all persons in employment
so that
$VA\,/\,H$ is the hourly productivity
t represents time

This specification introduces no break in the trend but nevertheless can only be used in the short term, since it leads to zero change in productivity over the long term.

One might also have adopted a specification in which the trend hourly productivity gains are constant for given periods. This means introducing exogenous trend breaks that do not necessarily have an explanatory character.

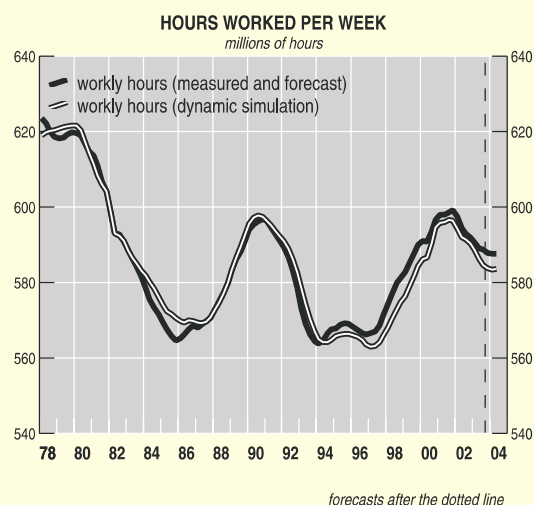$$LOG\,(VA\,/\,H) = \alpha + \beta t + \beta'\,t' + Other\ variables$$

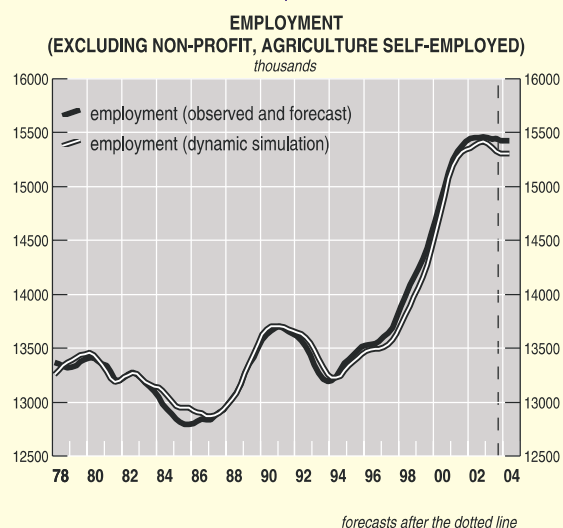where:
t' represents a trend break for a given period.

This type of specification is more consistent with the theory of long-term growth, but it necessitates the introduction of trend breaks. This is the specification that was adopted for analysis in this special report, partly because it involves econometric properties that are more satisfactory in the short term and partly because it makes it possible to bring out an effect of the average cost of labour on employment.

The equation finally adopted therefore takes the form:

Ⓐ

HOURS WORKED PER WEEK
millions of hours

forecasts after the dotted line

Ⓑ

EMPLOYMENT
(EXCLUDING NON-PROFIT, AGRICULTURE SELF-EMPLOYED)
thousands

forecasts after the dotted line

It will be seen that two variables were added in order to explain the trend evolution in hourly productivity. These were, first, the estimated effects of employment policy LOG(PE) on hourly productivity. These effects can be distinguished according to two types of policy:

- those aimed at reducing the cost of labour, generally speaking since the beginning of the 1990s (general exonerations of employers' social insurance contributions for the lower-paid) or more closely targeted as in the case of the CIE arrangements; the downward effect on labour productivity *(see box 2 for a description of the principal measures relating to employment policy and the way in which these effects were estimated).*

INSEE

BOX 1: THE ECONOMETRIC EQUATION USED FOR THE ANALYSIS

- those aimed at reducing the collective duration of labour since 1996 (first the "Robien" and then the "Aubry" laws) which tended rather to increase gains in hourly productivity: because of the reorganisation needed in order not to reduce the given level of production, which led to employment effects that were not as great as the observed decline in working time; because of the delays in recruitment to compensate for the immediate reductions in working time. In practice, in order to allow for these two effects, the impact of the RTT measures on hourly productivity is calculated by difference between the decline in duration and the estimated effect on employment *(see box 2 for the way these effects were estimated)*.

In the equation adopted, the effects of the employment policies on hourly productivity are estimated in ad hoc fashion and imposed in the equation. A possibility would be to estimate without constraint on the basis of macroeconomic data the effect of the working time and the cost of labour. However econometrics has a difficult job in depicting over a long period observed trends and trend breaks in the three variables labour productivity, decline in working time and evolution in the hourly cost of labour, and the effects of the different variables depending closely on the choice of estimation. It was therefore preferred to impose these effects in the equation, the idea being to estimate a trend in hourly productivity that would be independent of these policies aimed at increasing the employment content of growth.

Moreover, the additional effect of the real average hourly wage excluding employers' social insurance contributions (LOG(SHM)) was introduced into the equation. This means that, apart from the cuts in employers' contributions concentrated on the lower-paid, the average hourly cost of labour in real terms has an impact on firms' demand for labour. This is what one would expect to find theoretically, taking a model in which firms decide their demand for labour as a function of the parameters of their production function (of the Cobb-Douglas or CES type, for example), of the demand for their goods and of the relative cost of labour.
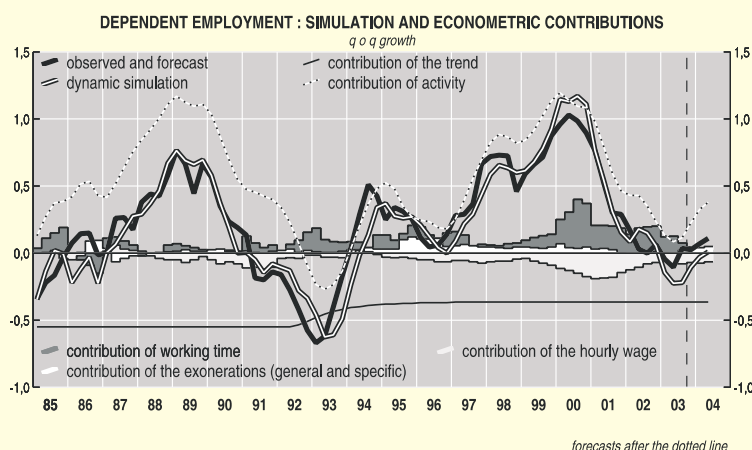
For the long term, the estimate was made for the period 1978-2003 using the Stock and Watson [1993] method:

$$LOG\,(VA\,/\,H) = -6{,}97 + 0{,}55\%\,t - 0{,}19\%\,t\,'$$
$${}_{(-6{,}7)}\qquad {}_{(11{,}6)}\qquad {}_{(-3{,}9)}$$

$$+\,0{,}16\,LOG(SHM) + LOG(PE)$$
$$\phantom{+\,0{,}16}{}_{(1{,}5)}$$

The variables used are as follows:

- VA : GDP of the mainly competitive sectors, excluding agriculture and real estate, in the quarterly national accounts; the exclusion of the farm and the non-marked sectors is justified by the highly specific manner in which activity and employment are constructed for it, notably on the basis of annual information. The exclusion of the real estate branch is justified by the large contribution of rents to the total value added, this being a form of output that requires no labour input.

- $H = D * E$: hours worked in the non-farm mainly competitive sectors

- $E = N + NS$: dependent and independent employment in the non-farm mainly competitive sectors, estimated by the "emploi et revenus d'activité" Department; the independent employment, available in the form of annual data, is subjected to interpolation in order to obtain quarterly data.

- D: average working time in the non-farm competitive sectors; the elements of the working time for employees are constructed from the quarterly national accounts and will be published at the beginning of 2004; in the case of the collective working time for dependent full-time workers, the data were back-calculated for the period prior to 1990 using the old quarterly accounts base; as the data were not all available prior to 1990, the elements linked to absence for personal motives (strikes, illness) or specific motives (partial unemployment, unemployment due to weather conditions) and which contribute especially to quarter-to-quarter changes, were not taken into account; for independent workers, the average working time is assumed to be stable throughout the period.

DEPENDENT EMPLOYMENT : SIMULATION AND ECONOMETRIC CONTRIBUTIONS
q o q growth

forecasts after the dotted line

BOX 1: THE ECONOMETRIC EQUATION USED FOR THE ANALYSIS

- *SHM* is the average monthly wage deflated by average working time for dependent workers and by the prices of the value added derived from the quarterly accounts

- *LOG(PE)* is the effect of the various employment policy measures *(see box 2)*.

- *t* expresses time and *t'* represents a trend break starting with Q4 1992; the choice of this date in order to distinguish between two sub-periods of productivity gains was made according to econometric criteria. Before the break, the growth in hourly productivity was 2.4% at annual rate; it thereafter slowed to an average of 2.0%.

the year 1982 was characterised by exceptional variations in hourly productivity that were partly attributable to the reduction in statutory working time.

The variable *VA'* is found in synchronous, lagged and advanced form. The introduction of advanced activity can be justified by the notion that a part of employment, namely that relating to temporary agencies, which makes a substantial contribution to the quarterly changes in total employment, contains advanced characteristics in relation to activity *(see box 5)*. ■

The short-term equation

The equation for hours worked in the short term is then adopted in the form of an error correction model, in which the number of hours is adjusted to the long-term target. In the same way as for the long-term equation, the effects attributable to the various employment policy measures are imposed in the short term. This gives:

- $LOG(H') = LOG(H) + LOG(PE)$, the number of hours worked excluding the effects of employment policies on employment.

- $LOG(VA') = LOG(VA) - (0{,}55\% \, t - 0{,}19\% \, t')$

In addition to the variables already selected for the long-term equation and described above: the sign Δ indicates a quarterly change; $DUM821$ and $DUM823$ are dummy variables for quarters 1982Q1 and 1982Q3, since

EMPLOYMENT (EXCLUDING NON-PROFIT AGRICULTURE)
q o q growth

forecasts after the dotted line
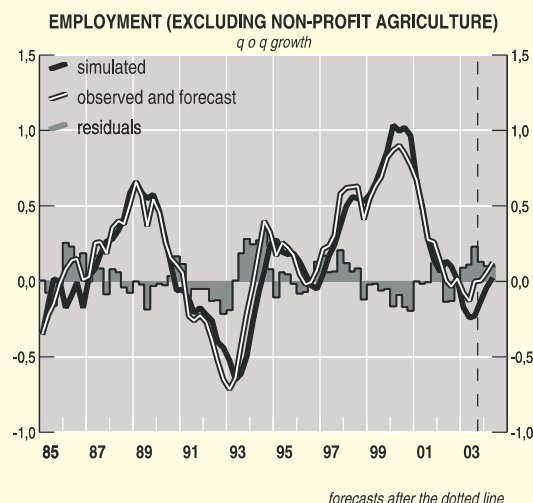
The short-term equation can then be written in the form:

$$\Delta LOG(H') = 0{,}72\Delta LOG(H')_{-1} - 0{,}22\Delta LOG(H')_{-2} + 0{,}22\Delta LOG(H')_{-3} - 0{,}11\Delta LOG(H')_{-4}$$
$$(9{,}3) \qquad\qquad (-2{,}2) \qquad\qquad (2{,}3) \qquad\qquad (-1{,}5)$$

$$+ \, 0{,}07\Delta LOG(VA')_{+1} + 0{,}10\Delta LOG(VA') + 0{,}04\Delta LOG(VA')_{-1} - 0{,}05 * \Delta LOG(SHM)_{-4}$$
$$(3{,}5) \qquad\qquad (5{,}4) \qquad\qquad (1{,}7) \qquad\qquad (-2{,}3)$$

$$- \, 0{,}05 \left[LOG(H') - LOGVA' - 7{,}05 + 0{,}15 LOG(SHM) \right]_{-1} - 0{,}7\% DUM821 + 0{,}5\% DUM823$$
$$(-2{,}7) \qquad\qquad\qquad (-6{,}3) \qquad\qquad (4{,}2)$$

Estimation for the period 1978Q1 to 2002Q4 - adjusted R^2 =91,6% ; RMSE=1,10% ; DW=1,69
Between brackets: Student t statistics

TABLE A : EMPLOYMENT EQUATION: OBSERVED, SIMULATED AND CONTRIBUTION

(quarterly growth in %)

	2002				2003				2004	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Total employment (dependent + independent) observed and forecast	0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.1	0.1
Total employment (dependent + independent) simulated	0.1	0.1	0.1	0.0	-0.2	-0.2	-0.2	-0.1	0.0	0.0
Contribution of the residuals	0.1	-0.1	-0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1
Contribution of working time (partial time and RTT)	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Contribution of activity	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.4
Contribution of trend	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Contribution of the hourly wage	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Contribution of the exonerations (general and specific))	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Dependent employment (observed and forecast)	0.2	0.0	0.0	0.1	0.0	-0.1	0.0	0.0	0.1	0.1
Dependent employment (simulated)	0.1	0.2	0.1	0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.0

Coverage: non-farm principally competitive sectors.

Forecast for Q4 2003 and 2004

BOX 2: EMPLOYMENT POLICIES IN THE MARKET SECTOR: DESCRIPTION AND IMPACT ON TOTAL EMPLOYMENT

It is possible to consider three main types of measure aimed at increasing the job content of growth. The first comprises all specific arrangements reserved for particular groups in difficulty on the labour market (notably the young and the long-term unemployed). These arrangements are in most cases based on exonerations from social insurance contributions. The second comprises all the various arrangements of a general nature aimed at reducing the relative cost of employing low-paid workers, most of whom are unskilled. Finally, a third type of measure consists of a reduction in the number of hours worked, either through the encouragement of part-time working or legislation introducing collective reduction in working hours (RTT).

The specific arrangements

Since the trend break in the mid-1970s in growth in activity and employment, there has been a succession of measures to assist employment. Some involved very small numbers of beneficiaries and cannot be taken into account in the macroeconomic analysis of employment. Others were on a larger scale and their supposed effects on employment are incorporated in the employment equation *(see box 1)*. Based for the most part on a decline in the relative cost of labour for the targeted groups, they can be broken down into three main types[1]:

- The "sandwich contracts" aimed at encouraging recruitment of young and long -term jobseekers especially. They take the form of apprenticeship contracts, acquisition of skills, adaptation and orientation. They enable the firm to a the person less than the minimum wage, to receive specific aids or to benefit from exonerations from social insurance contributions. In return, the employer undertakes to provide the beneficiary with orientation or training.

- The exonerations and recruitment bonuses may involve the young and the long-term unemployed, but also the recruitment of a first, second or third worker in certain particularly disadvantaged geographic regions (for example, the special arrangements for "urban free zones", "rural rehabilitation zones" or "urban revitalisation zones"). Within this group, the contract for return to employment (CRE), followed since 1995 by the contrat initiative emploi (CIE), have benefited large numbers of people in the 1990s. The CIE is intended for, among others, long-term jobseekers all those aged over 50, for beneficiaries of the "minimum insertion income" (RMI) or the specific solidarity allowance (ASS), and for unemployed youths. The CIE is an indefinite contract or a fixed-term contract of between 12 and 24 months, full-time or part-time. It takes the form of an exoneration from contributions that can be accompanied by a bonus of 152 to 305 a month, depending on the type of beneficiary. More recently, the "contracts for younger workers in companies" (CJE), introduced in 2002, are

aimed at people aged less than 22 without the baccalaureate. The contract has to be of indefinite duration and the employer receives a monthly aid ranging from 225 to 292 euros, degressive over 3 years, depending on the wage paid. The "minimum income from activity" (RMA) as currently envisaged for 2004 can also be considered as forming part of this type of arrangement.

Mention could also be made of other specific or sectoral policies, which, without being particularly focused on employment, may have had an appreciable impact on its evolution. One example might be the cut in VAT from 20.6% to 5.5% on work carried out inside existing dwellings.

The general measures to cut labour costs

Since the beginning of the 1990s, employment policies have been redirected towards general measures in the form of cuts in employers' social insurance contributions in the case of workers paid around the minimum wage. These cuts have gradually built up in volume and there have been numerous modifications since 1993, notably changes in the maximum threshold giving entitlement to exonerations and in their amount at the level of the minimum wage. Starting in 1996, the "rebate on low wages" (RBS) was raised to 18.2 points of contribution at the level of the minimum wage, thereafter being degressive to 1.33 times the minimum wage.

The buildup of these measures was interrupted in 1998, on the generally accepted assumption that the substantial reductions in contributions granted to firms moving to the 35-hour week were not for the purpose of creating jobs but rather to finance the additional hourly cost attributable to the reduction in hours worked (see above).

In the framework of the harmonisation of nominal wages, new generalised exonerations have been introduced since July 2003, through the "Fillon" law dated 17 January 2003 relating to wages, working hours and the expansion of employment (see Insee [2003]). For firms remaining on a 39-hour week, the maximum reduction as of July 2003 is 20.6% of the wage at minimum level and declining thereafter to 1.5 times the minimum wage. As of 1 July 2005, the reduction will be the same as for firms on a 35-hour week: a maximum reduction of 26% at the level of the minimum wage, declining thereafter to 1.7 times the minimum wage. In the employment equation, part of this additional exoneration for firms remaining on the 39-hour week is in fact compensated by a rise in the average real wage attributable to the adjustment in the hourly minimum wage.

Estimates used for the impact on employment of measures based on a reduction in the cost of labour

The impact on employment of variations in the cost of labour has been the subject of numerous studies arriving at varied results. The macroeconomic estimates in many cases fail to arrive at stable or significant results regarding

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(1) These various arrangements are described in more detail in the " Bilans annuels de la politique de l'emploi" from the Dares or in Dares[2003]

**BOX 2: EMPLOYMENT POLICIES IN THE MARKET SECTOR:
DESCRIPTION AND IMPACT ON TOTAL EMPLOYMENT**

the elasticity of employment to its cost *(see box 1)*. However, many microeconomic studies generally arrive at an elasticity that is negative and significant *(see Dormont [1997], Laroque and Salanié [2000], and Crépon and Desplatz [2002])*.

The impact of a reduction in labour costs is likely to be all the larger if it is concentrated on the lower-paid workers performing mainly unskilled jobs. On top of the substitution effect between capital and labour there is then a substitution effect between skilled and unskilled workers. But this is not the only substitution effect between factors of production: firms may decide to lower their prices, with a possible impact on the demand for their products and hence on their own demand for labour. When the outcome is only one of market share gains at the expense of other firms or other sectors, this nevertheless indicates substitution effects between factors at a more aggregated level, with demand shifting towards goods requiring more unskilled labour in their production processes. Finally, it is possible to consider the channel consisting of the improvement in external competitiveness, via the modification in the relative cost of labour versus the rest of the world.

The various microeconomic studies have concentrated respectively on one or more of these different channels. After making allowance for the diversity of interpretations and results, for practical purposes a "consensual" medium-term elasticity of -0.6 between the demand for unskilled labour and its cost was adopted *(see Dares, DP, Insee [1997])*. This was implicitly based on various factors: elasticities of substitution between factors of production ranging between 0.18 and 0.88 in different sources as regards the two types of labour, between 0.5 and 1.1 between labour and capital; the sensitivity to prices of demand for goods and especially for services; a macroeconomic reconciliation effect (not taking financing into account) recalling all the positive effects of reduced inflation (competitiveness, lower savings, etc) or of improved corporate profitability.

As regards the general exoneration of employers' social insurance contributions for the lower-paid, the apparent elasticity comes out at slightly greater than unity, since the reduction in the average cost of labour is concentrated on roughly 20% of the total wage bill *(see Dares [1996])*. In practice, therefore, unit elasticity was applied to the buildup of exonerations. Given the incentive mechanisms implied by this elasticity, timelags regarding action on the employment front are assumed to be spread over time *(see Malinvaud [1998])*. In practice, a lag of 5 years was applied. In principle this elasticity incorporates effects transiting through the rise in demand, which it would be erroneous to incorporate directly into an employment equation, since they are already included in the growth in activity. However, this approximation seems second-order in relation to the standard deviation of the results

obtained concerning overall elasticity. For example, it does not take into account the problem of the financing of the measure.

As regards targeted arrangements, concentrated in most cases on the lower-paid, the principle is the same and is based on this elasticity of -0.6 between the volume of unskilled labour and its cost. For each arrangement, this is applied to the amount of the average exoneration; one then has "employment coefficients" that are applied to the variation in the number of beneficiaries observed or expected, thus enabling to estimate the impact on employment. The assumption here is that timelags in taking action are shortened (one year), as is justified by the fact that the measure has to be used in order to benefit from the advantage in terms of labour cost.

As regards measures of a sectoral nature, such as the partial reduction in VAT in the building industry, an impact of 30,000 jobs was adopted on the basis of the Métric model (excluding the macroeconomic reconciliation). Here again, part of the estimated effect might possibly not be incorporated in the equation if it were possible to distinguish it when the effect is via the channel of a rise in demand, thus already contributing to employment via an increase in GDP.

The measures aimed at reducing working hours

The measures aimed at reducing working hours in order to share out working time initially involved part-time work. This was the case, for example, of the rebate granted for recruitment of part-time workers, which until 2002 consisted of a reduction of the order of 30% in employers' social insurance contributions. It may also have been true of the measure consisting of general reductions in social insurance contributions which could well have acted as a considerable incentive for the development of part-time working when the reduction was put on a pro rata basis in 1996. The employment equation being formulated in hourly terms, no additional specific effect was introduced, since the development of part-time working partly attributable to these arrangements is already taken into account in reduction in the average working time.

Since 1996, the measures have tended rather to involve the collective reduction of working hours. Initially introduced under the " Robien" law (1996), the diffusion of the 35-hour week was substantially stepped up with the "Aubry 1" and "Aubry 2" laws (1998 and 2000, respectively). The " Robien" law proposed an arrangement that was an incentive for introducing reductions in working hours, in the form of reductions in wage-earners' social insurance contributions to finance the additional hourly cost of labour generated by the move to the 35-hour week.

The "Aubry 1" law set the legal duration of the working week at 35 hours in January 2000 for firms with more than 20 employees, in January 2002 for the rest. It introduced an arrangement replacing that of the "Robien" law, acting

**BOX 2: EMPLOYMENT POLICIES IN THE MARKET SECTOR:
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as an incentive to the social partners to negotiate a reduction in working hours before the reduction in statutory working time. The decline in working hours had to amount to at least 10%, calculated on an equivalent basis. A certain number of firms reduced their collective working hours without any incentive, anticipating or conforming to the new statutory duration of 35 hours. This was the case, on the one hand, of the large public-sector firms that reduced working time without being able to benefit from the reduction in social insurance contributions and, on the other, of firms in the private sector that did not enter into the incentive arrangements, either because they would not or could not commit themselves to the minimum conditions for the granting of the aids.

The "Aubry 2" law confirmed the timetable for the reduction in statutory working time and organised the new regime for working hours: definition of the effective working time, system governing overtime, system for a monthly guarantee of wages at the level of the minimum wage. It also introduced an annual reduction in social insurance contributions, declining from 26 points of contribution at the level of the minimum wage to 610 euros per worker at the level of 1.8 times the minimum wage and beyond. This reduction then replaced the degressive reduction on wages below 1.3 times the minimum wage and can in part be combined with the incentive aids. This reduction is granted to firms covered by a majority agreement on a collective working time less than or equal to 35 hours, without any condition regarding the scale of the reduction.

The assumed impact on employment is based on the *ex post* comparison of firms that have moved to 35 hours with firms that remained on 39 hours, of equivalent size and sector, taking account of the previous dynamic affecting workforces, particularly for the firms that moved to 35 hours (see Passeron [2002]). The estimated employment effect is of the order of 6.5% for a decline of 10% in the framework of the "Robien" or "Aubry 1" incentive arrangements. On the assumption of unchanged production compared with a situation in the absence of a reduction in working hours, the impact on hourly produc-

tivity would therefore be around 4.5%, in other words slightly less than half the amplitude of the reduction in working hours itself. For the other firms, which in most cases benefited only from the structural easing provided for in the "Aubry 2" law, the average decline was smaller, being of the order of 8% for those moving to 35 hours in 2000. On the assumption of hourly productivity gains comparable to those calculated for firms reducing by 10%, the impact on employment adopted for the firms concerned are therefore substantially smaller (in practice, the impact adopted was 2.5%). An average timelag of 6 months was chosen for the period between the agreement on the reduction in working hours and the actual recruitments; the measure of the effect is based on the number of workers concerned by the arrangements.

The precautions adopted in these studies (allowance for scale and sector effects, as well as for the previous momentum of employment) are perhaps not enough to neutralise sufficiently the auto-selection effects (the firms that moved soonest to 35 hours were probably those that had the greatest interest in doing so). The orders of magnitude that are adopted here and are the only ones currently available are therefore liable to revision.

If the reduction in working hours is accompanied by reductions in the cost of labour, these are not considered independently as contributing directly to the impact on employment; in the same way as the hourly productivity gains or the wage restraint negotiated within the firm, they make it possible to finance the additional hourly cost related to the reduction in working hours. No attempt is therefore made to separate the contributions of the various components of the arrangements.

All in all, for the employment equation, since the object variable is the number of hours worked, it is necessary to consider only the effect of the reduction in working hours on hourly productivity. This effect is calculated by difference between the supposed effects of employment on the reduction in working hours and the measured reduction in working time. ∎

BOX 3: PREDICTING EMPLOYMENT IN THE VERY SHORT TERM USING BUSINESS SURVEYS

As in the case of the analysis of the business climate, business surveys are commonly used by INSEE to capture the very short-term tendencies reported by business leaders concerning their workforces. In addition to the sets of questions relating to production, demand, inventories and prices, the business surveys include questions on the past and expected evolution in the firms' workforces: "tendencies over the past three (respectively, next three) months", to which the business leaders provide qualitative answers, either 'falling', 'stable' or 'rising'.

As in the case of the activity variables, calibration models incorporating this advanced qualitative information are used in order to obtain a quantitative forecast of employment as estimated quarterly. Compiled for the main sectors of activity, these take the following generic form:

$$\Delta LOG\ N = A + B\ BALANCE + Other\ variables$$

Where:
$\Delta LOG\ N$ represents the growth rate of employment in the sector concerned
$BALANCE$: represents the balance of past or prospective opinion regarding workforces, or a function of the balance.

The other variables are specific to each of the sectors.

Calibration equations by sector [1]

For each equation, the aim is to obtain the best possible estimate for the growth rate of employment (defined here by $\Delta LOGN = 100 * (N / N_{-1} - 1)$). Figures between brackets show the Student 't' statistic to give an indication of the significance of the coefficients.

In forecasting mode, the balances of opinion regarding the past are estimated with the aid of the balance regarding the future.

● *Manufacturing industry:*

$$\Delta LOGN = -0{,}05 + 0{,}29\Delta LOG\ N_{-1} + 0{,}83\% * PAST\ BALANCE + 1{,}40\%\ DEMAND$$
$$\quad\ \ (-1{,}38)\quad (3{,}50)\qquad\quad (6{,}46)\qquad\qquad\quad (4{,}14)$$

Estimation period : 1978Q3 – 2002Q4 $R^2_{aj} = 0{,}87$ $RMSE = 0{,}18$

Where:
$PAST\ BALANCE$ is the balance of opinion regarding workforces in the quarterly survey of activity in industry
$DEMAND$ is the balance of opinion regarding the past tendency in demand in the same survey.

● *Construction*

$$\Delta LOGN = 0{,}44 + 0{,}33\Delta LOGN_{-1} - 0{,}33 * \Delta LOG\ SAL_{-1} + 1{,}87\%\ FORECAST\ BALANCE + 3{,}58\%\Delta DIRENC$$
$$\quad (4{,}0)\quad (3{,}2)\qquad\qquad (-3{,}5)\qquad\quad (4{,}5)\qquad\qquad\qquad\quad (3{,}4)$$

Estimation period :1980Q1 – 2002Q4 $R^2_{aj} = 0{,}82$ $RMSE = 0{,}35$

where:
$FORECAST\ BALANCE$ is the weighted balance of opinion regarding expected workforces in construction (78%) and public works (22%)
$DIRENC$: recruitment difficulties in the building industry
$\Delta LOG\ SAL$: growth rate of wages in building and public works (obtained from the Acemo survey carried out by the Dares directorate in the Ministry of Labour and Social Affairs)

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(1) These are calculated by each of the administrators responsible for surveys in the "enquêtes de conjoncture" Division (M-A. Arnoult, Th. Deperraz, I. Lefebvre, C. Rousseau, S. Serravalle)

BOX 3: PREDICTING EMPLOYMENT IN THE VERY SHORT TERM USING BUSINESS SURVEYS

● *Distributive trades*

$$\Delta LOGN = 0{,}08 + 0{,}19\Delta LOGN_{-1} + 0{,}18\Delta LOGN_{-2} + 0{,}23\Delta LOGN_{-3} + 0{,}17\Delta LOGN_{-4} + 2{,}94\% PAST\ BALANCE\ CG_{-1}$$
$$\quad (1{,}6) \quad (1{,}7) \qquad\qquad (1{,}6) \qquad\qquad (2{,}0) \qquad\qquad (1{,}5) \qquad\qquad (2{,}9)$$

$$- 2{,}86\%\ PAST\ BALANCE\ CG_{-3} + 2{,}25\%\Delta\ FORECAST\ BALANCE\ CD_{-3}$$
$$\quad (-3{,}1) \qquad\qquad\qquad (3{,}1)$$

Wher

Estimation period : $1984Q1 - 2002Q4$ $R^2_{aj} = 0{,}66$ $RMSE = 0{,}22$

e:
PAST BALANCE CG is the balance of opinion regarding the recent tendency in workforces in the survey dealing with wholesale distribution
FORECAST BALANCE CD is the balance of opinion regarding the expected tendency in workforces in the survey dealing with retail distribution

● *Transport*

$$\Delta LOGN = 0{,}09 + 0{,}54\Delta LOGN_{-1} + 0{,}27\Delta LOGN_{-3} + 1{,}99\% PAST\ BALANCE + 2{,}04\% PAST\ BALANCE_{-1}$$
$$\quad (1{,}3) \quad (4{,}3) \qquad\qquad (2{,}0) \qquad\qquad (1{,}4) \qquad\qquad\qquad (2{,}1)$$

Estimation period : $1992Q1 - 2002Q4$ $R^2_{aj} = 0{,}51$ $RMSE = 0{,}39$

PAST BALANCE is the balance of opinion regarding the recent tendency in workforces in the study of road transport hauliers carried out by the Ministry of Equipment

● *Services excluding temporary employment agencies*

$$\Delta LOGN = 0{,}37 + 0{,}58\Delta LOGN_{-1} + 2{,}14\% FORECAST\ BALANCE + 1{,}45\%\ REPRE_{-1}$$
$$\quad (4{,}3) \quad (5{,}9) \qquad\qquad (2{,}9) \qquad\qquad\qquad (3{,}8)$$

Estimation period : $1990Q2 - 2002Q4$ $R^2_{aj} = 0{,}68$ $RMSE = 0{,}17$

Where :
FORECAST BALANCE is the balance of opinion regarding workforces in market-sector services excluding temporary employment agencies
REPRE : balance of opinion in the same survey regarding expected operating income

In all, we have equations covering virtually the whole non-farm competitive branch excluding temporary employment. The only exceptions are certain specific and relatively "smooth" sectors (finance, energy). Aggregation of the various simulations gives quarter-to-quarter results that are very close to the evolution in the overall aggregate excluding temporary employment agencies *(see graph A)*.

The case of temporary agency employment

Given the very wide quarter-to-quarter swings in temporary employment, and its leading nature in relation to the rest of employment and even to activity *(see box 5)*, it is not easy to find an indicator and a calibration that permits a satisfactory capture and credible forecasts in the case of this sector. As a result, the usual balance concerning persons employed in the temporary employment agencies is sometimes in contradiction with the tendency of temporary employment as measured directly. It seems in fact that this sector is too highly concentrated for the figure for a balance weighted by numbers employed to be the most relevant. Evolutions in the balance calculated without weighting by numbers employed seems to provide a better match with measured evolutions in temporary agency employment in the recent past *(see graph B)*. It is this balance that is used in a calibration model making it possible to predict temporary agency employment. This model is in fact based on information derived from surveys in the building and public works sector, which are particularly important users of temporary agency staff.

BOX 3: PREDICTING EMPLOYMENT IN THE VERY SHORT TERM USING BUSINESS SURVEYS

Equation for temporary agency employment:

$$\Delta LOGN = 3{,}18 - 0{,}30\Delta LOGN_{-3} - 0{,}37\Delta LOGN_{-4} + 2{,}09\ PAST\ BALANCE_{-1} + 5{,}90\Delta\ FORECAST\ BALANCE\ TP_{-1}$$
$$(4{,}6)(-2{,}5)(-2{,}8)(3{,}1)(2{,}9)$$

$$+ 4{,}22\Delta\ FORECAST\ BALANCE\ BAT_{-1} + 16{,}4 * DUM974$$
$$(2{,}3)(4{,}5)$$

Estimation period : 1990Q1 – 2002Q4   _adjusted_ R^2 = 0,55   _RMSE_ = 3,44
Standard deviation of the variable to be explain : 5,14   _Figures between brackets_ : _Student ' t' statistics_

Where:
PAST BALANCE is the balance of opinion regarding past workforces in temporary employment agencies
FORECAST BALANCE TP is the balance of opinion regarding future workforces in public works
_FORECAST BALANCE BAT_ is the balance of opinion regarding future workforces in building

The standard deviation of the object variable to be explained (5.14%) in relation to the evolutions in employment in the other sectors (in industry, for example, it is 0.55%). While calibration makes it possible to explain 55% of the variance, the residual standard deviation of the estimate remains substantial (3.44%).

Generally speaking, the various calibrations involving the principal non-farm competitive sectors indicate that employment excluding temporary agencies should stabilise in the last part of 2003. Information regarding temporary agency employment is slightly more optimistic: whether it be from business leaders in the temporary agency sector or those in building and public works, all the explanatory variables point to a rise in temporary agency employment in these last months of the year, possibly amounting to 1.5%, given the differences between observation and simulation in the past _(see graph C)_. All things considered, employment in the competitive sector can expected to rise by just under 10,000 in Q4 2003. ■

B

TEMPORARY AGENCY EMPLOYMENT AND BALANCE OF OPINION
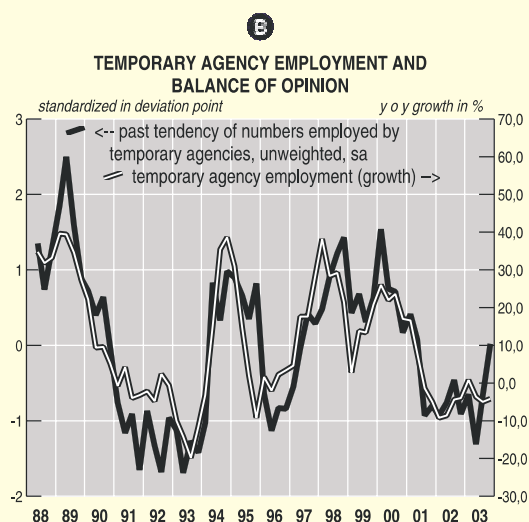
A

COMPARISON BETWEEN SIMULATED AND OBSERVED, NON-FARM COMPETITIVE SECTORS, EXCLUDING TEMPORARY AGENCY EMPLOYMENT

forecasts after the dotted line
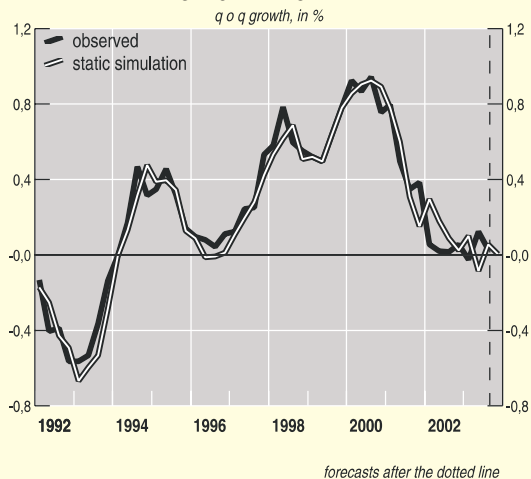
C

CALIBRATION OF EMPLOYMENT BY TEMPORARY AGENCIES
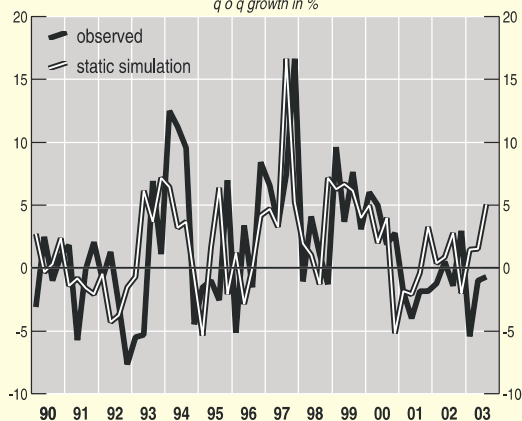
INSEE

BOX 4: MEASUREMENT AND FORECASTING OF TOTAL EMPLOYMENT

The forecasting of employment necessarily requires that it be properly measured. Estimates of employment are made annually by INSEE for all sectors and quarterly for the numbers of employees in the competitive sector.

The available sources

The quarterly estimates of employment are based on three principal sources: the survey of activity and conditions of employment of manpower (Acemo) carried out by the Dares, the statistics of establishments affiliated to the Unédic unemployment insurance scheme, and the statistics compiled using information regarding the Urssaf social insurance contributions (the Épure source). The statistics for the number of temporary agency jobs are drawn up by the Dares using the data collected by Unédic from the temporary employment agencies. Since some of

the sources cover only firms with more than 10 employees, it is necessary to make an econometric correction for bias.

The quarterly data are revised each year on the basis of the annual estimates of employment. These estimates cover the various forms of employment (dependent and independent, assisted or otherwise) as well as all sectors of activity. They are based on several sources:

- For the competitive sectors, Unédic's exhaustive annual statistics, the statistics provided by Épure, by the "Mutualité sociale agricole" in the case of the competitive farm sector, the annual declarations of social data (DADS) or direct contact with firms.

- For the non-competitive sectors, for agriculture and for the independent workers, the sources used are more numerous: data from the Mutualité Sociale Agricole for dependent and independent workers in agriculture prin-

TOTAL EMPLOYMENT
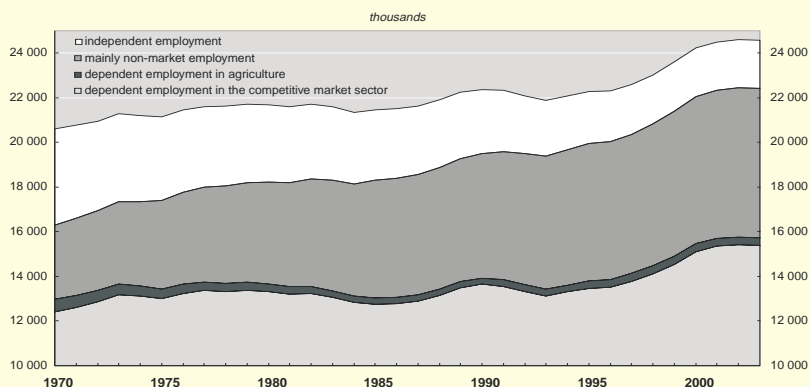
DEPENDENT EMPLOYMENT MAINLY IN THE NON-MARKET SECTOR
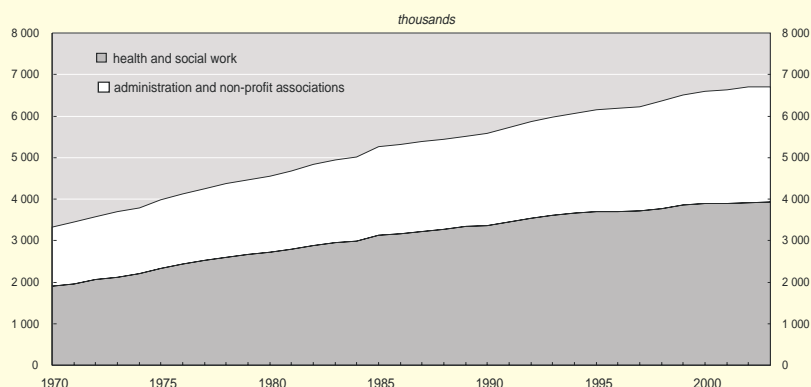
BOX 4: MEASUREMENT AND FORECASTING OF TOTAL EMPLOYMENT

cipally; from Acoss (Agence centrale des organismes de sécurité sociale) for the other independent workers; civil service pay slips for the number of officials; specific surveys (for the healthcare sector, for local authorities); from Unédic for market establishments; statistics of the number of CES, CEC and CEJ contracts in the case of assisted employment [1].

The annual estimates are made at the geographic level of the départements taking level 36 of the composite economic classification (NES).

The forecasting

The forecasting of dependent employment in the competitive sector *(see box 1)* is merely one part of the forecasting of employment. Since 1970, a roughly constant portion of total employment has fallen outside the coverage of the short-term statistics, since roughly 40% of the active workers in employment are independent or dependent workers in sectors that are "essentially non-market", i.e. education, health, social work, public administration and non-profit associations *(see graph A)*. These sectors cover a very wide range of situations, which react very little or very slowly to changes in the economic situation.

The independent workers

This definition covers independent workers, farm-owners, assistants in the home, salaried company heads, the professions, etc. This list is not exhaustive, since the best way of defining the non-wage-earning group is by opposition to the wage-earning group.

The share of independent workers in total employment has been in continual decline: from 21% in 1970 to less than 9% in 2003. The fall was particularly marked between 1990 and 1996 (23%) and seems to have slowed down in recent years. For some years now, the evolution in the number of independent workers seems to be linked neither to the economic situation nor to the number of company start-ups: the forecast is essentially a forward extrapolation of the tendency seen in recent years.

The essentially non-market tertiary sector

This sector, where employment has been rising strongly since 1970, from 16% to 27% of total employment is made up mainly of workers in the three categories of public administration (central government, local government and hospitals). Out of 6,264,000 people (as of 31 Dec 2001), 86% were in the civil service (45% in central government, 26% in local authorities and 14% in hospitals). Roughly 5% of workers in the sectors are on state-assisted contracts (essentially CES, CEC and CEJ).

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(1) For a description of the monitoring of non-market employment in France, see Insee [2002].

NON-PROFIT EMPLOYMENT
annual change in %
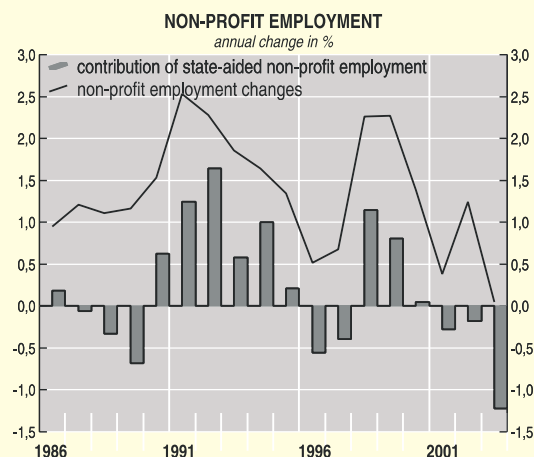
The number of jobs created in this sector is linked to the number of posts allowed for in the budget laid down every year as part of the Finance Act, to the evolution in the number of beneficiaries of assisted contracts in the sector and to the job creations in the other components of employment.

Forecasts of variations of the number of "budgetary posts" in the various categories of the civil service (central and local administration, various organs dependent on the central administration and members of the Armed Forces) are first of all adjusted for the purely budgetary effects (essentially because of part-time working a post does not necessarily correspond to a person with a job), in order to obtain the evolution in terms of non-assisted employment in central and local administration.

Employment in healthcare and market-sector education, as well as in non-profit associations is estimated separately, taking account of substitution effects with the principal arrangements for assistance to employment in the non-market sector.

However, the principal source of variability in the sectors stems from the assisted employment, since over the last 10 years assisted employment in the non-market sector accounts for 90% of the variability of non-market employment *(see graph C)*. The credits (in terms of numbers of beneficiaries) for each of these measures to assist employment are voted as part of the budget; the effects on employment under each of these arrangements (rate of ending of contracts, windfall effects) are estimated separately as a function of the characteristics of these arrangements and of the variations in the stocks of beneficiaries. ∎

BOX 5: TEMPORARY AGENCY EMPLOYMENT, A LEADING VARIABLE IN THE CYCLE?

Temporary agency employment is generally regarded as a leading variable in the economic cycle. As a form of employment it is flexible and reactive and carries low fixed costs and recruitment times compared to other contracts. A firm faced with an unexpected rise in demand can increase output by recruiting temporary agency workers until such time as it can launch recruitment in more traditional forms if the demand persists.

Temporary agency work is therefore an important adjustment variable: temporary agency work accounts for only 3.6% of wage-earning employment in the competitive sector, but quarter-to-quarter variations in temporary agency employment explain 18% of the variation in the evolution of employment each quarter *(see graph A)*. Year-on-year changes in temporary agency employment accordingly amounted to 40% in 1994 and 1997 and -10% in 2001, roughly 10 times the corresponding figures for employment excluding temporary agency workers.

Analysed using econometric tests, the quarterly variations in temporary agency employment "cause" in the Granger sense those of GDP and employment, while immediate variations in GDP or employment are not significant as regards variations in temporary agency employment.

Thus, in the following VAR model:

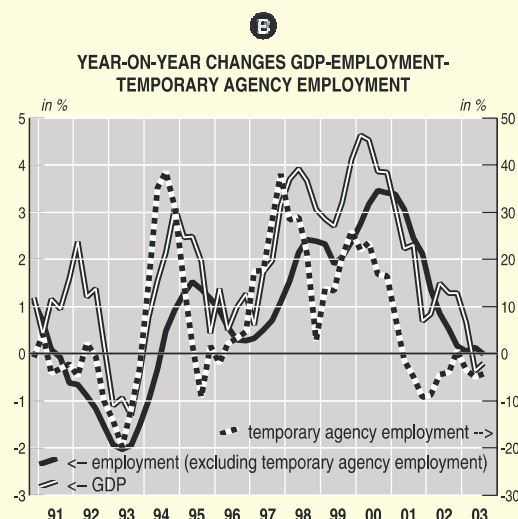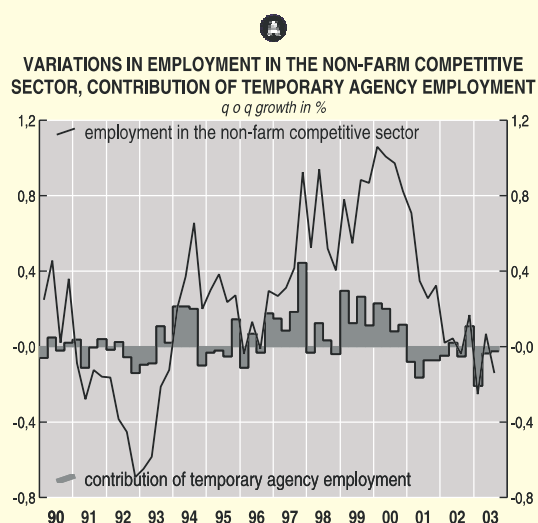$$I_t = \sum_{i=1}^{p} a_i I_{t-i} + \sum_{i=1}^{p} b_i E_{t-i} + \varepsilon_{1t}$$

$$E_t = \sum_{i=1}^{p} c_i I_{t-i} + \sum_{i=1}^{p} d_i E_{t-i} + \varepsilon_{2t}$$

where I_t is the quarterly variation in temporary agency employment and E_t the variation in employment excluding temporary agencies, the b_i coefficients are jointly not significant, but the c_i coefficients are. The same results are obtained if the variation in the employment excluding temporary agency work is replaced by the variation in GDP.

A

VARIATIONS IN EMPLOYMENT IN THE NON-FARM COMPETITIVE SECTOR, CONTRIBUTION OF TEMPORARY AGENCY EMPLOYMENT
q o q growth in %

B

YEAR-ON-YEAR CHANGES GDP-EMPLOYMENT-TEMPORARY AGENCY EMPLOYMENT

This causality in the Granger sense signifies in this case merely that temporary agency employment precedes evolutions in activity and in employment, as is suggested by a comparison of the year-on-year changes in the variables *(see graph B)*.

In the case of GDP, the correlation is at its maximum when temporary agency employment is lagged by one quarter (62%) and still remains high taking lags of two or three quarters; in the case of employment excluding temporary agencies, the correlation is at its maximum with temporary agency employment lagged by two to four quarters (53%) and remains high for a lag of five quarters.

Lower forecasting of temporary agency employment is therefore a more tricky matter than that of activity, since it involves using a longer forecasting time-horizon. Nevertheless, business surveys can shed additional light,

Nul hypothesis	Fisher statistics	p-value
Temporary agency employment do not cause...		
- Employment excluding temporary agency employment	21.23	<0.0001
- GDP	22.20	<0.0001
Employment does not cause temporary agency employment	1.83	0.40
GDP does not cause temporary agency employment	1.10	0.58

Interpretation:
A test is made for the joint nullity of the lagged coefficients. The null hypothesis is the nullity of the coefficients: for the first line in the table, for example, taking the previous notations, a test is made for $c_i = 0$ for all i indices; the statistic is 21.23, which is significant at the 5% level. The calculations are made with p=2.

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BOX 5: TEMPORARY AGENCY EMPLOYMENT, A LEADING VARIABLE IN THE CYCLE?

notably through the analysis of services provided by the temporary employment agencies, and through that of the user sectors *(see box 3).*

However, temporary agency employment is a variable with a very uneven evolution, partly because of its high re-activity and partly because of the difficulty of measuring it: from one working day to another, the number of tempo-rary agency workers in post varies on average by 70,000,

and even as much as 220,000, out of a total ranging be-tween 500,000 and 600,000 (550,000 in June 2003). Even with instruments making it possible to adjust for sea-sonal variations or number of working days, it remains statistically difficult to extract an underlying tendency at the end of the month, given the specificities, the number and timing of official holidays, leave, etc for each of them. Interpretation of monthly evolutions is therefore difficult and their interpretation is delicate in the short-term. ∎