

The employment cycle

Small-sized companies were the first to cut their workforce during the crisis

Julie Argouarc'h
Étienne Debauche

**Employment Analysis
and Outlook**

Vincent Cottet

**Markets and corporate
strategies division**

Anna Smyk

**Administrative sources on
employment and income**

Employment cycles are traditionally analysed through aggregate statistical series. For France, INSEE publishes quarterly employment forecasts for the market sector, divided into broad sectors. This macroeconomic approach hides the dynamics that are specific to each company: at any given moment, some companies will create jobs whereas others will destroy them. Moreover, employment trends differ between very small sized companies - craftspeople or small shop owners - and large groups listed on the stock market.

This report looks at the aforementioned unevenness between companies. It remains an aggregate approach, but relies on the diversity of individual situations since the beginning of the 2000s. We recreated, from the employment flow observed at company levels, job creation and destruction gross flows for the market sector, as well as employment series per company size.

Job creation and destruction gross flows are substantially higher than the net variation in the job market, as a large part of these movements are compensated for at every moment. While it is not the first time that this phenomenon has been pointed out, the report does shed a contextual light on the matter: indeed, the process of job creation and destruction changes drastically throughout the economic cycle.

In this respect, the results of this report may appear somewhat counterintuitive. One might expect job creations to pick up in the high phase of the cycle, and destructions to intensify during lower periods. This vision is quite radically contradicted by the flows observed in France over the last ten years. In ten years, job creation dynamics seem to have slowed down slightly. They are not responsible for the rise in employment that occurred between 2004 and 2007. The latter was due exclusively to the lull in job destruction. Conversely, the 2008 recession started with a new dip in job creations while job destructions levelled off, at least up to mid 2009.

The study of job flows according to company size also reveals striking differences. In 2008 in particular, job losses started at an earlier point in small sized companies. On the contrary, large corporations held on to their workforce during the recession, particularly in the industrial sector.

The employment cycle

The macroeconomic analysis of trends on the job market offers an imperfect view of the job creation and destruction process in companies

Traditional explanations of the link between growth and employment are based on the productivity cycle

In market sectors, on an aggregate level, employment trends over the last 10 years have followed the economic cycle

Since 2000, job creations in the market sectors have followed three phases. From 2000 to 2003, they slowed down substantially, with a slight drop in employment in 2003 (see graph 1). Then from 2004 to 2007 employment rose more rapidly, thanks to sustained economic growth. Finally, in early 2008, employment level started to decrease, and this decrease gathered pace substantially in the second semester of 2008 due to declining economic results.

Almost 600,000 jobs were therefore lost in the market sectors between Q2 2008 and Q4 2009. Non-market sectors, on the other hand, are less sensitive to the changes in the economic situation.

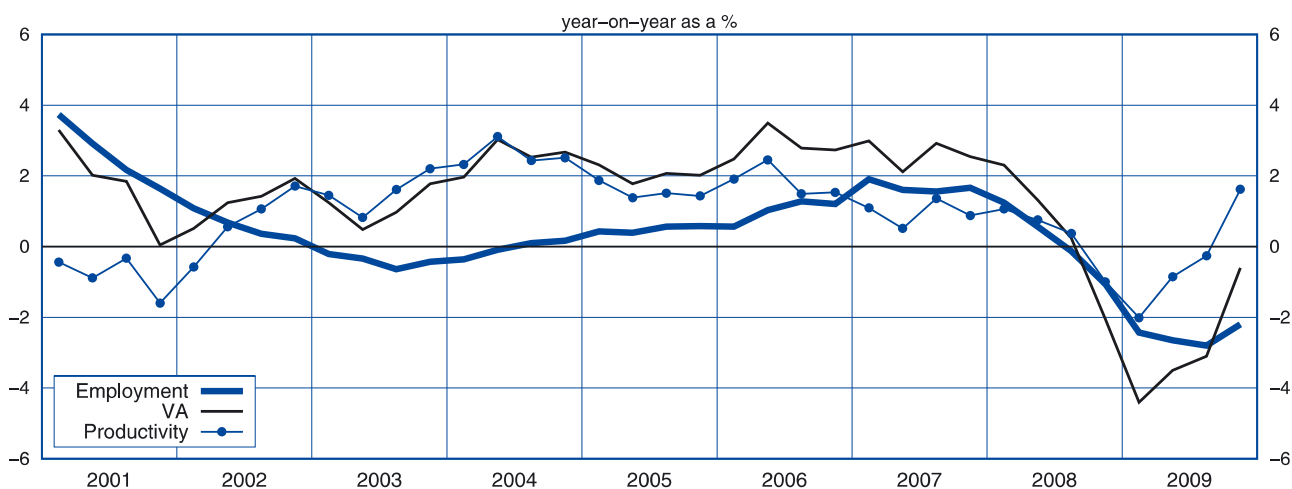
But employment trends adjust late to production trends

Indeed, the consequences on employment of economic variations occur with a certain delay. This time lag in employment adjustment to economic shifts creates what are called productivity cycles.⁽¹⁾ A decrease in economic activity results first of all in lower productivity as employment falls less abruptly than production: before any layoffs, entrepreneurs choose to cut working hours or resort to part-time work. Conversely, at the end of a recession, economic recovery does not generate immediate job creation: before hiring, companies start by increasing working hours, for example. By deciding not to increase their workforce immediately, they restore the productivity they lost during the period of economic lull. An economic cycle therefore usually goes hand in hand with a productivity cycle.

The pace and extent of the adjustment of work volume to economic activity do not depend only on the flexibility of worked hours, through working hour modulation or partial unemployment. It is also subject to the prevailing type of contract, the

(1) Productivity is defined as the ratio between added value and employment. When employment is measured in number of people it is labelled productivity per head, if it is measured in working hours it is called hourly productivity.

1 - Employment, value-added and productivity (non-agricultural market sectors)



Source: INSEE

average seniority of the workforce, uncertainties surrounding future opportunities for the company. The extent to which temporary work has been used is yet another short-term employment adjustment method.

The overall variation in employment is also the result of sectoral trends, each sector having its own specificities

The sectoral distribution of employment also influences the evolution of employment on an aggregate level. Indeed, sectoral dynamics are very different. First of all, productivity gains are not consistent from one sector to another: the industrial sector will tend to make strong productivity gains, unlike services. Another difference is that sectoral economic trends may happen at separate points in time: the construction sector reacted late when the economic situation dipped late 2008. Lastly, the productivity cycle in itself may be more or less acute from one sector to another, according to the different factors mentioned above.

Industry has been shedding jobs since 2001 (see graph 2). Even in periods of sustained growth, increased economic activity did not result in higher employment due to high increases in productivity. Conversely, employment rose substantially in construction over the period of economic growth. It rose by 4% in 2007 alone.

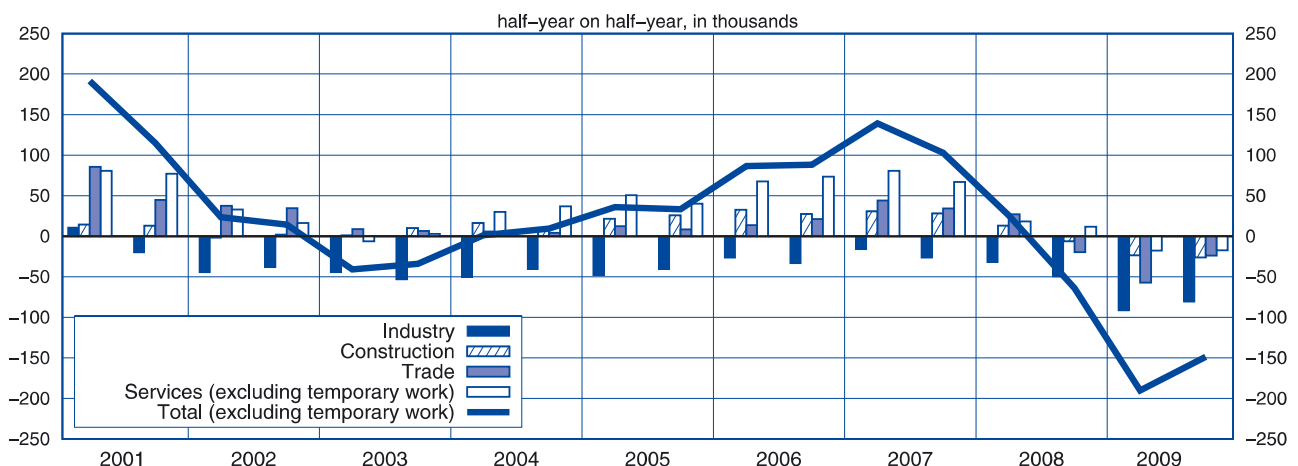
Employment was equally dynamic in the service industry. A part of this increase was due to the rise in the number of temporary workers, who are counted as tertiary workers regardless of the sector their missions take place in.⁽²⁾ But excluding temporary workers, employment in the service industry has grown over the last ten years.

The macroeconomic trends in employment are accompanied by a dispersion of sectors and businesses

The macroeconomic analysis, the main points of which we have just stated, relies on average employment trends, which are “net” job flows in the economy at a given moment. Yet these flows are the result of a wide variety of situations of companies: at any moment some create jobs while others shed workers.

(2) The industrial and construction sectors employ over half of all temporary workers.

2 - Changes in total employment and by sector, excluding temporary work



Source: INSEE

This report looks at the microeconomic components of employment cycles. It relies on the data used to perform employment estimates, i.e. quarterly statements filled out by companies for the URSSAF (Social Security contribution collection agency). This data includes neither temporary workers nor ex-GEN (large state-owned companies such as SNCF or RATP). (see box 1).

The aggregation of this individual company data makes it possible to construct longitudinal series from the beginning of the 2000 decade. They offer a new vision of job movements over the period. In the second part we study job creation and destruction flows, for the economy as a whole and by sector of activity. In the third part, we analyse these flows according to company size.

Box 1 - Employment data per company, excluding temp work and large state-owned companies

The employment data used in this report was taken from quarterly statements made by companies to the URSSAF (Social Security contribution collection agency). Indeed, any company attached to the agency, regardless of its size, must declare at least once a quarter the amount of wages paid and total workforce per establishment at the end of the quarter. The declared workforce does not take temporary workers into consideration, as they are employed by the temping company.

These statements are then reprocessed by INSEE (in a channel called "Epure") and are used as one of the main sources for monitoring of employment trends. This source has been available since 1997, but we have been using it here since Q4 2001 in order to ensure sufficient quality for the building of fine series.

This source is not used for the estimation of employment growth in the so-called ex-GEN (large state-owned companies) as the quality obtained for these companies is not constant over time. The same is true for temporary work. The latter is measured by the Dares from statement files from the National employment agencies. Overall, the scope of the study concerns market-sector jobs, excluding GEN and temporary work.

This data on workforce per establishment is then processed to obtain data on a company level. We register this field by subtracting head offices and holdings, for which employment variations have no economic relevance. Conversely, we retain sole proprietorships, foreign-law legal entities and trading companies.

The data is then sorted by sector of activity. Industry includes all sectors EB to EG in the old economic classification system (*nomenclature économique de synthèse*: NES). Construction corresponds to the EH sector. The label "trade" includes trade as such (EJ) but also transport (EK) and hotel, restaurants and catering activities (P1 in NES36). Services include all other tertiary sectors, in particular services to businesses and to individuals.

Choosing the size brackets

Decree n° 2008-1354 of 18 December 2008 defines the different categories of companies using several measurement factors: employed workforce, total assets, annual turnover. In terms of workforce, the decree breaks companies down into the following categories:

- 1 to 9 employees: micro-enterprises
- 10-249: small and medium-sized enterprises
- 250 - 5000: intermediate enterprises
- over 5000: large enterprises

The choice of size brackets for this report followed the definitions of the decree except in the case of large companies: in order to maintain a sufficient number of jobs in that bracket, we brought the threshold down to 1,000 employees. This made it possible to work with comparable brackets in terms of weight in overall employment.

Another threshold - which the decree does not consider - could have been used: the 50-employee mark, which corresponds to a legal constraint for employers, who have to implement job saving plans if they want to carry out at least 10 redundancies in one month. This 50-employee mark was tested and did not alter the results. In practice employment dynamics around this threshold are similar.

The decree also establishes a new notion for companies, which was not retained here. In this new definition, companies are no longer restricted to a single legal entity, identified by a SIREN company registration number. They can cover a variety of legal entities linked by financial and organisational ties. These can thus be called groups of companies, made up of a lead company and its subsidiaries. In this report, we focused exclusively on legal entities.

The series presented in this report are all seasonally adjusted (S.A, X12 method). For gross flows, we only retained cycle trends, which make it possible to read the main trends. The series by size are S.A and presented year-on-year. ■

The process of job creation and destruction changes according to the position within the cycle

At any given moment, companies with growing numbers of workers and those with declining workforces coexist. Many academic studies, in the USA and in France, have analysed the flows of concomitant job creations and destructions by companies: the net growth of these gross job flows seems rather modest.

This report reviews these studies from a more trend-based standpoint, in order to highlight cyclical dynamics. One of the objectives is to analyse whether the drop in employment during the 2008 recession was the result of lagging job creations or rather an increase in destructions.

A breakdown of employment into “gross” flows

A breakdown into four terms: H (increase), B (decrease), C (creation), D (Destruction) ...

Over one quarter, the net variation of employment can be broken down into four terms (see box 2):

- The total amount of jobs created by “perennial” companies with a growing workforce over the quarter (“growing companies”) labelled NH;
- The total amount of jobs destroyed by “perennial” companies with a decreasing workforce over the quarter (“declining companies”) labelled NB;
- The total amount of jobs created by new companies (“business start-ups”), labelled NC;
- The total amount of jobs destroyed by disappearing companies (“company disappearances”), labelled ND;

Box 2 - H (Increase), B (Decrease), C (Creation), D (Destruction): four terms to divide employment growth into gross flows

The estimation of net employment growth can be broken down into different gross flows. More specifically, it is considered as the difference between jobs created by growing companies and jobs destroyed by declining companies. Every quarter, companies are thus sorted into categories according to the variation of their workforce over the quarter. Thus, NH amounts to the total employment in growing companies over quarter q (NH_q is the overall workforce at the end of the quarter, NH_{q-1} is the overall workforce at the beginning of the quarter). The same is done with declining companies (NB), newly employing companies (NC) and companies that have ceased to employ (ND).

The growth of total employment (E) is thus equal to the difference between gross flows counted positively (H and C) and gross flows counted negatively (B and D):

$$E_t - E_{t-1} = |NC_t - NC_{t-1}| + |NH_t - NH_{t-1}| - |NB_t - NB_{t-1}| - |ND_t - ND_{t-1}|$$

It is thus possible to describe this growth in terms of flows to explain the contributions to the employment growth rate:

$$\frac{E_t - E_{t-1}}{E_{t-1}} = \left| \frac{NC_t - NC_{t-1}}{E_{t-1}} \right| + \left| \frac{NH_t - NH_{t-1}}{E_{t-1}} \right| - \left| \frac{NB_t - NB_{t-1}}{E_{t-1}} \right| - \left| \frac{ND_t - ND_{t-1}}{E_{t-1}} \right|$$

Employment growth rate every quarter thus equals the difference between the increase ratio H, creation ratio C (counted positively), decrease ratio B and destruction ratio D (counted negatively):

$$\frac{E_t - E_{t-1}}{E_{t-1}} = H_t + C_t - B_t - D_t$$

The breakdown into gross flows also makes it possible to quantify the contribution of each component to economic trends. We can indeed compare two successive extreme points. The variation in the employment growth rate between these two extreme points results from the variation in ratios H,C,B,D between the two dates. ■

The employment cycle

It is possible to calculate the proportion of each employment flow with respect to overall market-sector jobs. The creation (C) ratio represents the proportion that the total number of jobs created in new companies over the quarter amounts to in market-sector jobs as a whole. In parallel, the destruction ratio (D) corresponds to the jobs destroyed by companies that disappeared over the quarter; the increase ratio (H) corresponds to the overall jobs created by perennial companies with an increasing workforce over the quarter; and the decrease ratio (B) corresponds to the overall jobs destroyed by companies with dwindling workforces. "Perennial" companies are those that had declared at least one employee for the previous quarter and have declared at least one for the current quarter. Company "start-ups" and "disappearances" therefore differ from the definition usually used by INSEE: an already existing company, but with no employees, will be considered as a start-up if it hires at least one worker during the quarter; conversely, a company can be considered as destroyed as soon as it ceases to declare any employees.

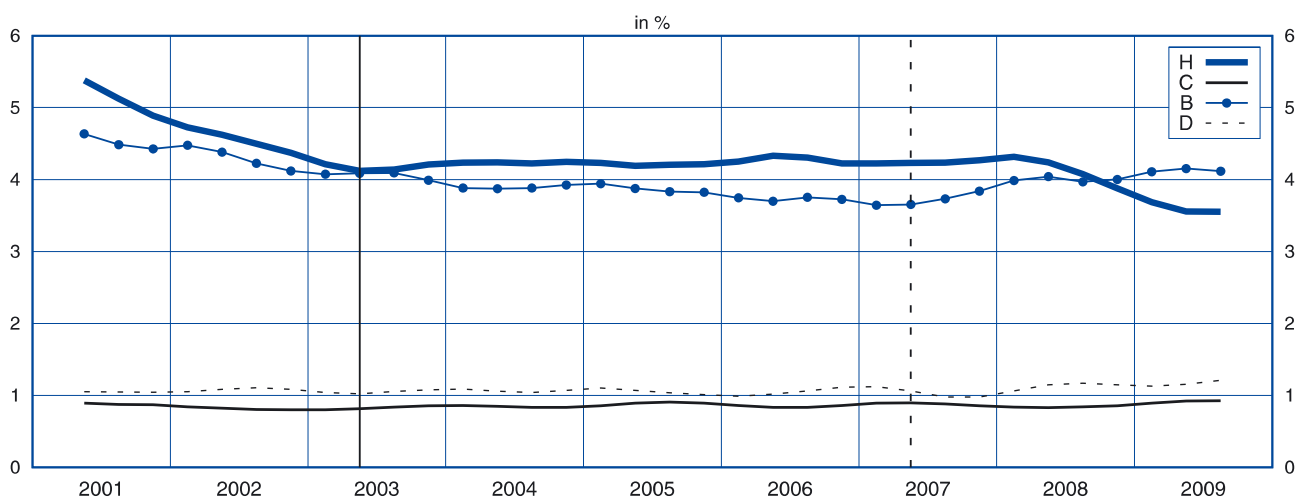
... reveals that employment cycles stem mainly from the variations in increase and decrease ratios

In terms of volume, creation and destruction flows account for a substantial share of overall employment figures, around 1% per quarter each. They are however relatively stable, whatever the general state of the economy, and compensate for each other more or less (see graph 3).

Therefore, a large part of the employment cycle is a result of the variations in the workforce inside perennial companies. The increase and decrease ratios each amount to around 4% per quarter, and are variable within the cycle (see graph 3).

To characterise the contributions made by these flows to the stages of employment cycles, we identified the different sub-periods thanks to their peaks and troughs. These correspond to the dates when the quarterly growth rate of employment in the market sector reached either its highest point (Q2 2001, Q2 2007) or lowest (Q2 2003, Q2 2009). For each of these quarters, the employment growth rate amounts to the sum of the creation, destruction, increase and decrease ratios (see box 2). In Q2 2003 for example, employment in the market sector dropped 0.2% (see table 1). The increase ratio, H, and creation ratio, C, contributed to the rise in employment, respectively by 4.1 and 0.8 points; conversely, the job decrease ratio, B, and destruction ratio, D, contributed to its drop, respectively by 4.1 and 1.0 points.

3 - Increase, decrease, creation and destruction ratios in the market sectors



Scope: excl. temporary workers and GEN (see box 1).
Source: INSEE

We then calculated the variation in the employment growth rate, from “peak to trough” or from “trough to peak” resulting from the variation in the different ratios H, B, C and D (see box 2). Thus, at the beginning of the period, between Q1 2001 and Q1 2003, the net employment growth rate fell by 0.8 points. This drop stems in large part from fewer job creations in perennial companies, the increase ratio having dropped by 1.3 points. This decrease was somewhat softened by the slowdown in job destructions, the decrease ratio having slipped by 0.5 points between these two dates.

Over the period studied, the contribution by the different gross flows to the net growth of employment fluctuated with the different stages of the cycle. The high point (2004-2007) and low point (since 2008) of the cycle clearly stand out.

Between 2004 and 2007, the improvement in the economic situation resulted in fewer job destructions rather than an increase in the pace of job creations

Thanks to the gross flow approach it is possible to explain the sources of job dynamism for the high period of the last cycle (2004-2007). The rise in employment was not the result of increased job dynamism in growing companies but rather a slowdown in employment destruction. The employment decrease ratio in perennial companies fell from 4.1% in 2003 to 3.7% in 2007 (see table 1). On the other hand, the number of jobs created by growing companies remained roughly stable, going from 4.1% to 4.2%.

This general message differs however from sector to sector (see graph 4). Of course, this positive contribution of the decrease ratio does transpire in all major economic sectors. But in the services and construction sectors, where employment was particularly dynamic, the increase ratio rose sharply, contributing to the acceleration of employment between 2003 and 2007. Conversely, in the trade and industrial sectors, where the acceleration of employment was less acute, the increase ratio fell: these two sectors were not carried by the employment dynamics in growing companies over the period.

In the services sector, the positive balance of company start-ups and destructions over the period is also a peculiarity.

Table 1

Gross flows (in rates) in the market sectors

	%				
	Peak 2001 Q2	Trough 2003 Q2	Peak 2007 Q2	Intermediate 2008 Q2	Trough 2009 Q2
Including increase ratio H (1)	5.4	4.1	4.2	4.2	3.5
Including creation ratio C (2)	0.9	0.8	0.9	0.8	0.9
Including decrease ratio B (3)	4.6	4.1	3.7	4.0	4.1
Including destruction ratio D (4)	1.1	1.0	1.1	1.1	1.1
Total (5)=(1)+(2)-(3)-(4)	0.6	-0.2	0.4	-0.1	-0.8
In difference	2001 Q1-2003 Q2	2003 Q2-2007 Q2	2007 Q2- 2008 Q2	2008 Q2- 2009 Q2	
Increase	-1.3	0.1	0.0	-0.7	
Creation	-0.1	0.1	-0.1	0.1	
Decrease (negative)	0.5	0.4	-0.4	-0.1	
Destruction (negative)	0.0	0.0	-0.1	0.0	
Total	-0.8	0.6	-0.5	-0.7	

Scope: excl. temporary workers and GEN (see box 1).

Source: INSEE

The employment cycle

Employment started slowing down in Q3 2007, even though creations remained positive. The main contributing factor to this slowdown was the intensification of job destructions in perennial companies: the decrease ratio rose while the increase ratio remained stable.

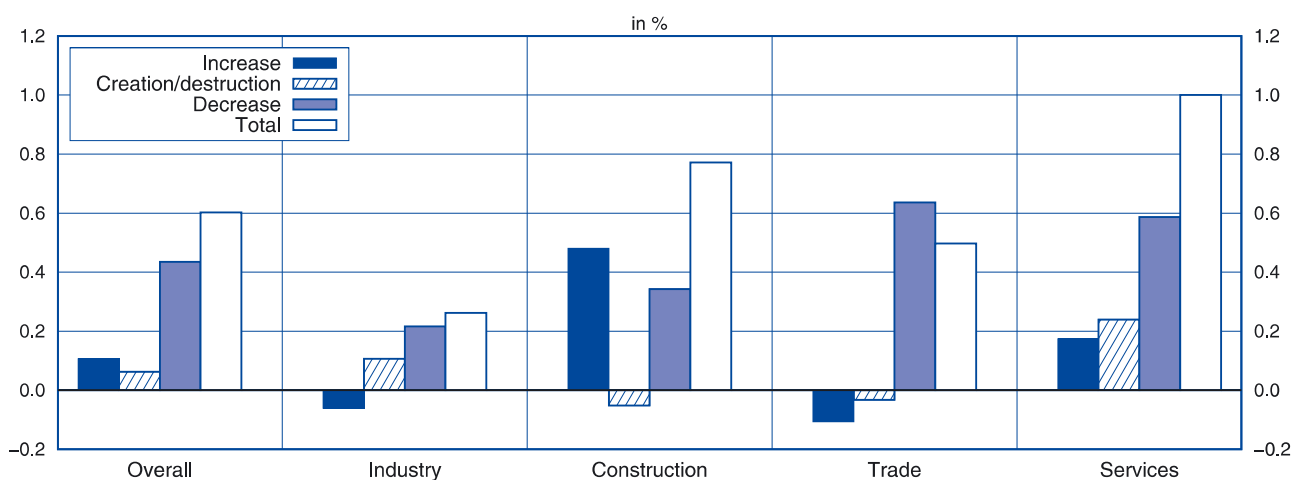
At the beginning of the crisis, on the contrary, the drop in employment resulted from the slowdown in job creations rather than an intensification of destructions

The recession that began in 2008 did not have a symmetrical impact on job flows either. Between Q2 2008 and Q2 2009, the quarterly employment growth rate went from -0.1 % to -0.8 %. This time, the decrease ratio remained almost stable over the period (going from 4.0 % to 4.1 %) while the increase ratio fell sharply (dropping from 4.2% to 3.5%, see table 1).⁽³⁾

Thus, and in a somewhat counterintuitive manner, job losses during the recession were mainly the result of a drop in job creations in perennial companies. It is, however, important to note that in mid-2009 the effects of the crisis could be felt neither in the pace of job destructions in perennial companies nor in job losses resulting from company disappearances. At this stage of the cycle, available data does not make it possible to clearly isolate the impact of layoffs and site closures: decrease or destruction ratios at the beginning of the crisis remained on a par with trends observed over the previous phase.

(3) The same study applied to data relating to the USA leads to a slightly different set of conclusions. Indeed, American flows are more in phase with the cycle, in periods of growth and crisis alike. In particular during the lower stages of the cycle - and contrary to what occurred in France - decrease flows rose sharply and played a major part in the adjustment of American employment to the economic situation.

4 - Contribution of the increase, decrease and creation / destruction ratios to the acceleration of employment between Q2 2003 and Q2 2007



Scope: excl. temporary workers and GEN (see box 1).
Source: INSEE

The industrial sector stands out due to job destructions occurring in perennial companies

Here again, the overall observation should be qualified along sectoral lines. Although in all sectors the contextual reversal of employment trends is explained by the drop in job creations in perennial companies, the industrial sector stands out due to an escalation of job destructions: the decrease ratio has risen by 0.4 points (see graph 5).

Were temporary work to be considered, which is not the case here, this observation would probably be reinforced. In early 2008, 316,000 temporary workers operated in the industrial sector. 18 months down the road, in mid-2009, there were only 172,000 left, almost a 50% drop. The adjustment of the industrial sector to the economic slump was for a large part explained by a plunge in temporary assignments.

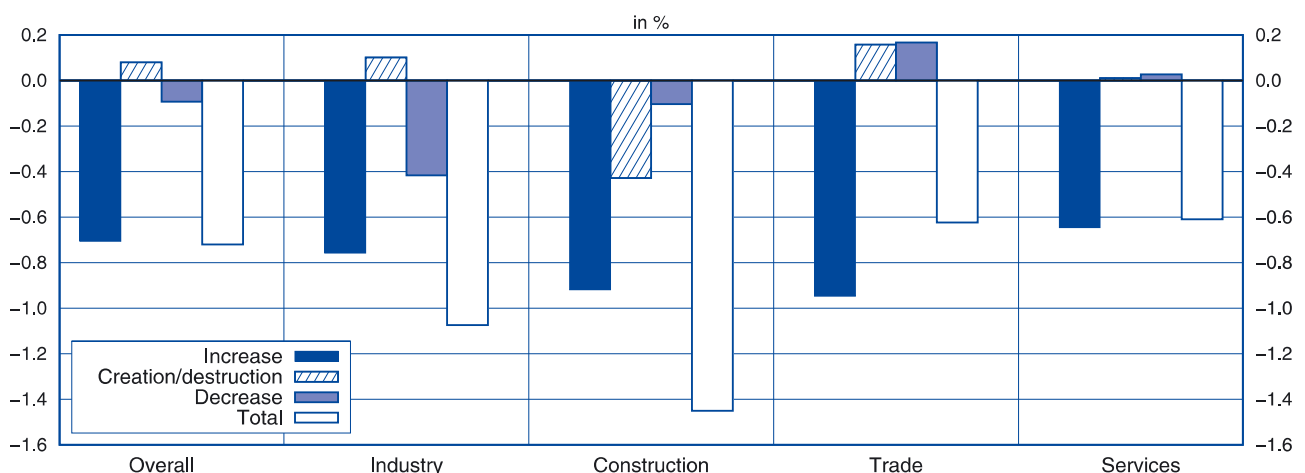
In the construction sector, company disappearances had a strong impact

The construction sector also underwent a significant drop in employment, contrasting sharply with the boom experienced in 2006-2007. Jobs created by growing companies, which had grown substantially, fell abruptly during the crisis. But the construction sector stands out due to a significant contribution of the balance of company start-ups/destructions: the high rate of job losses can for a large part be explained by company disappearances, which probably reflects the high proportion of small-sized companies in the sector.

Employment dynamics in the services and trade sectors are relatively similar, and match the overall dynamics: a virtually stable decrease ratio and a sharp drop in increase ratio during the crisis.

These differing sectoral dynamics are for a large part due to the structure of the productive fabric in these sectors. In the next part, we endeavour to highlight size effects to illustrate these sectoral specificities.

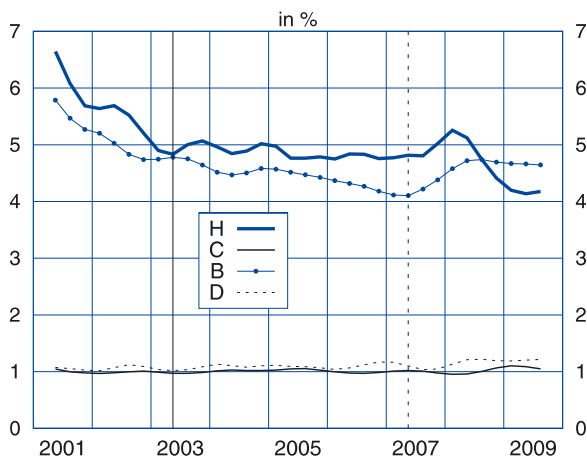
5 - Contribution of the increase, decrease and creation / destruction ratios to the employment trends between Q2 2008 and Q2 2009



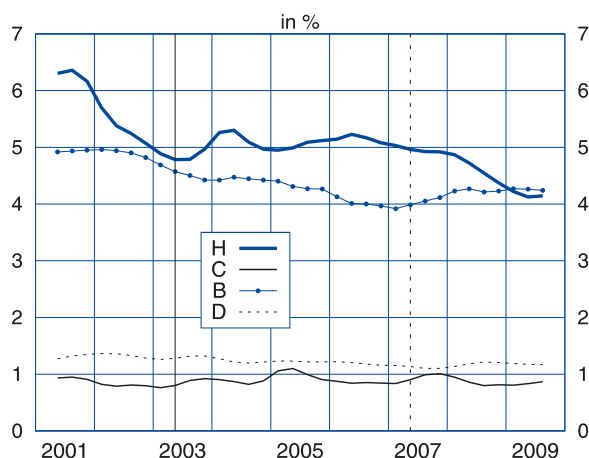
Scope: excl. temporary workers and GEN (see box 1).
Source: INSEE

The employment cycle

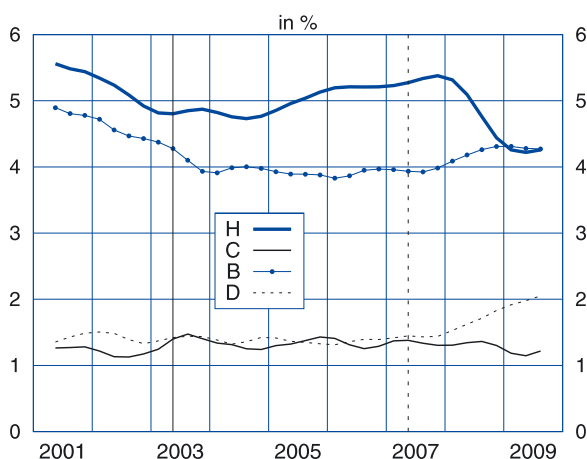
6 - Gross flows (in rates) in trade



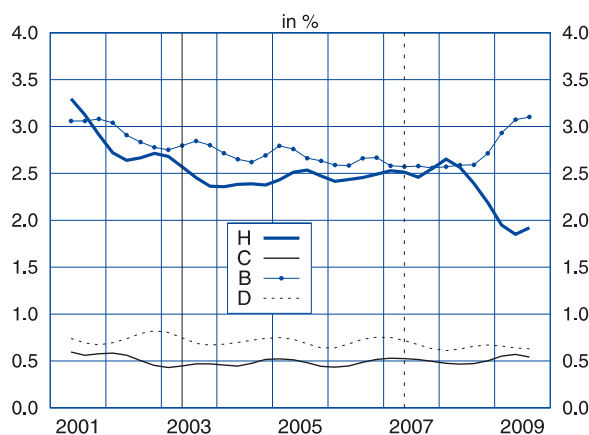
7 - Gross flows (in rates) in services



8 - Gross flows (in rates) in construction



9 - Gross flows (in rates) in industry



Note: the solid line represents a trough and the dotted line represents a peak
 Scope: excl. temporary workers and GEN (see box 1).

Source: INSEE

Small-sized companies, globally more reactive to the cycle

The reaction of companies to a plunge in economic activity can indeed depend on their size. Large corporations have relatively little internal flexibility leverage in their workforce management: requirement to develop job protection plans, higher workforce seniority, fewer fixed-term contracts; however, they benefit from extensive external flexibility: a greater recourse to subcontracting, temporary work and partial unemployment. Thus, they can retain the core of their workforce during periods of sustained lull in their activity. On the contrary, small-sized companies have less leverage in the event of a downturn: they often have a tight workflow and are usually faced with greater financial constraints.

Companies are divided into four sizes

Employment data at company levels make it possible to construct employment series according to size (see box 1). We have divided them into very small companies (under 10 employees), small and medium-sized companies (between 10 and 250), and large companies, with very large companies (over 1000

employees) in a separate section. This task is in fact more difficult than it may seem and requires a suitable methodology to process shifts from one section to another (see box 3).

Job distribution by company size differs from one sector to another (see table 2). For example, 84% of construction jobs belong to companies with fewer than 250 employees (and 36% in companies with fewer than 10) against 67% in the trade sector and 55% in services. The industrial sector is at the other extreme, with almost identical proportions of jobs in companies with fewer than 250 employees (52%, and only 10% for companies with fewer than 10 employees) and companies with more than 250 employees (48%). Very large companies, with over 1,000 employees, accounted for 27% of jobs in the industrial sector in 2007.

We will now compare employment dynamics according to the different company sizes, and contribution of the different size brackets to employment growth, taking their weight into consideration.

All categories of companies created jobs and were affected by the crisis

Employment in the different brackets followed roughly comparable trends over the period studied: during the growth period between 2004 and 2007, all categories of companies created jobs (see graph 10). They were then all affected by the crisis. However, employment fluctuations in the different brackets did not follow the same time frame, nor did they have the same impact in terms of intensity.

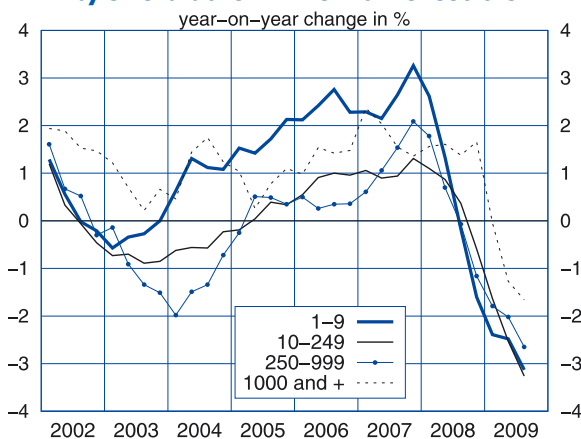
Table 2

Breakdown of employment by size bracket and sector in 2007

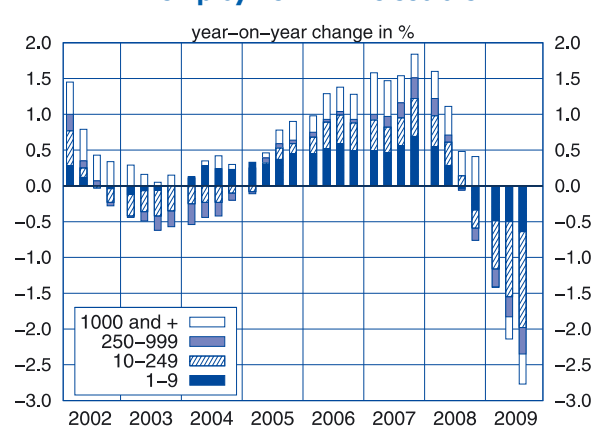
Sector	Size bracket			
	1-9	10-249	250-999	1 000 and +
Industry	10	42	21	27
Construction	36	48	8	8
Trade	26	41	10	23
Services	20	35	15	30
Total	21	41	14	24

Scope: excl. temporary workers and GEN (see box 1).
Source: INSEE

10 - Breakdown of employment by size bracket in the market sectors



11 - Contribution of size brackets to growth in employment in the sectors



The employment cycle

Small companies appeared more reactive, during the period of growth as well as during the crisis. On the contrary, employment followed a smoother pattern in larger companies: they were not affected by the downturn in 2002 in the sense that they kept creating jobs, albeit at a slower pace. And during the recession, the drop in employment appears to have started at a later date.⁽⁴⁾

Between 2004 and 2007, the variation of employment was more dynamic for very small and very large companies. The two categories offered the highest contribution to the rise in employment (+0.4 points for very small companies and +0.3 points for very large companies on average per quarter) (see graph 11).

Conversely, when the economy started faltering in early 2008, job destructions first started in small and medium-sized companies, which contributed strongly to the overall job losses during the recession. In companies of over 1,000 employees, which were affected by the downturn only at a later stage, employment figures went into the red only as of Q2 2009.

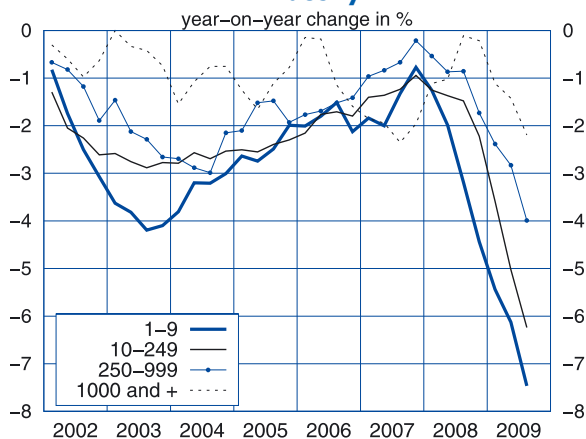
Employment in large industrial companies seems affected to a lesser degree by the crisis

In the industrial sector, medium-sized companies made the cycle due to their weight

In the industrial sector, there was an underlying decrease in employment, even though it was softened between 2004 and 2007. Over that period, large companies shed the fewest jobs (see graphs 12 and 13). On the contrary, medium-sized companies (particularly those in the 10-249 bracket) destroyed a high number of jobs (-2.0% on average year on year from 2004 to 2007): as they account for almost half of industrial jobs (42%), they made the highest contribution to the overall dip in employment. Their contribution is almost threefold that of very large and very small companies: -0.8 points as opposed to -0.3 points for the two other size brackets.

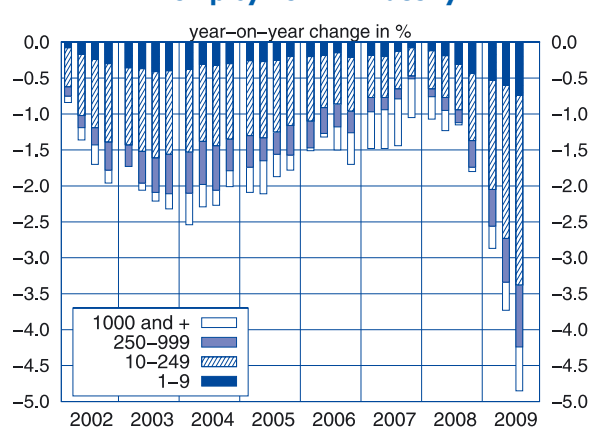
(4) Observations made in the American literature are on a par with those offered in this report. Indeed, in the USA all companies evolved with the cycle, regardless of their size. However, in France and in the USA, small companies were more greatly affected by sudden changes, be they positive or negative, and felt the effects of the crisis earlier than other companies.

12 - Employment trend by size bracket in industry



Scope: excl. temporary workers and GEN (see box 1).

13 - Contribution of size brackets to growth in employment in industry



Source: INSEE

During the recession, employment in very small companies (1-9 employees) dropped more severely than in other brackets; but as they only amount to 10% of industrial sector jobs their decline had a limited impact on the overall decrease. All in all, in periods of downturn and growth alike, medium-sized companies account for the major part of industrial employment cycles, especially those in the 10-249 bracket.

Differences according to size, a reflection of subcontracting relationships?

During the recession, very large industrial companies, which account for 27% of overall jobs, did not shed jobs to a greater extent than normal. Until mid-2009, they even maintained their workforce to a higher degree than other companies; this does not mean that they were not subsequently hit by the downturn.

However, the impact of large companies on overall industrial employment is decisive: it usually goes through the external channel of subcontracting. In periods of recession, when large corporations cease to place orders with their subcontractors, the latter - generally small and medium-sized companies - are the first to cut jobs. Hence, differences in employment trends according to company size, as has been observed since the beginning of the crisis, can in part be explained by these subcontractor relationships (see graph 12).

In construction, very small companies have a large impact on the cycle due to their number

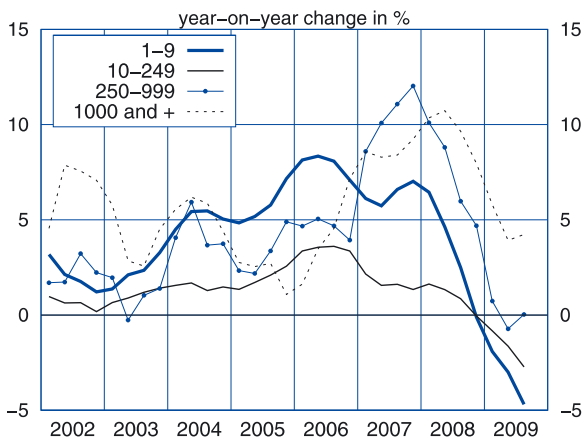
Very small companies account for over a third of construction jobs

At the peak of the construction cycle, very large and very small companies had the most dynamic employment trends. However, due to their weight in the sector, very small companies made the highest contribution to the rise in employment: +2.3 points on average over the 2004-2007 period, for a growth rate of 4.2% (see graphs 14 and 15).

The fall in employment did not begin in early 2008 as in other sectors, but rather at the end of the year, regardless of company size: there is a lag between the construction cycle and the rest of the economy. Since the beginning of 2009 very small companies have been shedding jobs at a fast pace, while very large corporations have not yet begun cutting their workforces.

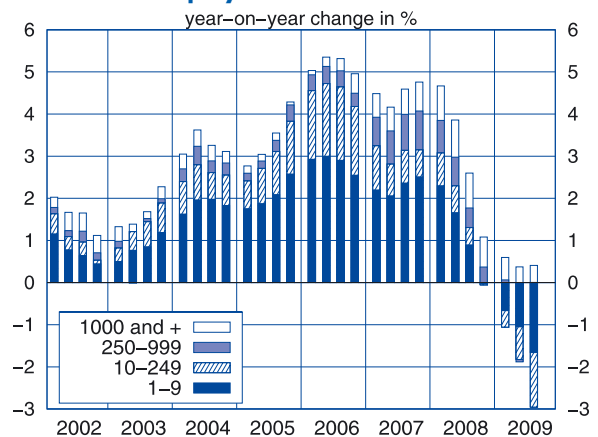
All in all, the smallest companies are those with the most volatile growth rate, in periods of crisis and growth alike. Because companies with 1 to 9 employees account for over a third of construction jobs, they are for a large part responsible for the dynamics of employment in the sector.

14 - Employment trend by size bracket in construction



Scope: excl. temporary workers and GEN (see box 1).

15 - Contribution of size brackets to growth in employment in construction



Source: INSEE

Finally, there are no discrepancies observed between size brackets in the dynamics over the cycle, as was the case for the industrial sector: employment started falling almost simultaneously in early 2009, except for very large companies which started adjusting slightly later.

Companies in the services and trade sectors react to cyclical fluctuations in a more synchronised manner

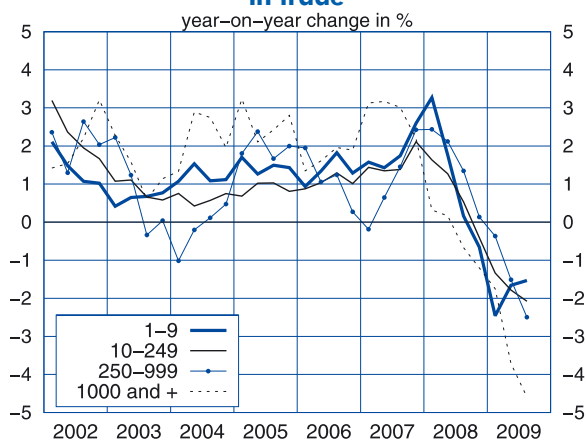
In the services and trade sectors, the size criterion appears less discriminatory in the description of employment trends.

In the trade sector, during the high period of the cycle (2004-2007), employment grew roughly to the same extent for the first three categories: around 1% year on year. This figure doubled for very large companies of over 1,000 employees. This gap is mirrored in their contributions: very large companies contributed most to the increase in employment over the 2004-2007 period (see graphs 16 and 17).

As of mid-2007, the very large companies in the trade sector were the first to experience a slowdown in employment growth, and even a decrease, contrary to what was observed in the construction sector. However, during the recession, very small companies hosted the greatest job losses. Thus, small and medium-sized companies (1-9 and 10-249) accounted for a large part of job losses in the trade sector at the beginning of 2009.

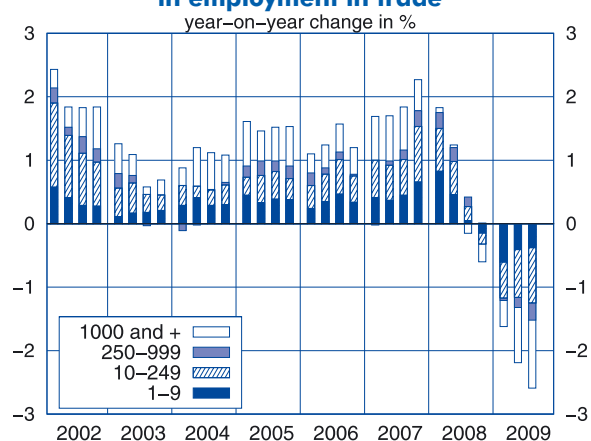
In the services sector, very large companies contributed greatly to the rise in employment during the peak years of the cycle (2004-2007). The slump in activity affected all companies equally, regardless of their size (see graphs 18 and 19).

16 - Employment trend by size bracket in trade



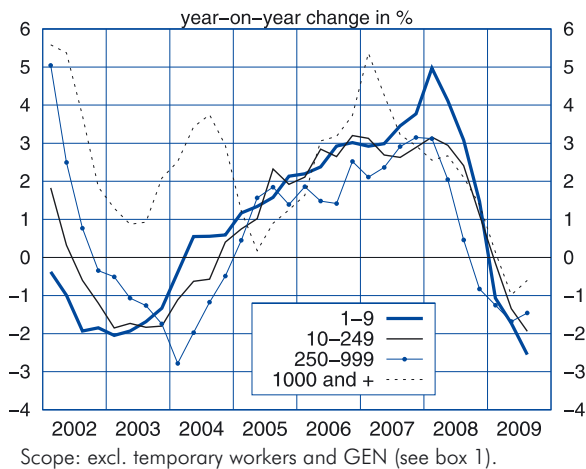
Scope: excl. temporary workers and GEN (see box 1).

17 - Contribution of size brackets to growth in employment in trade

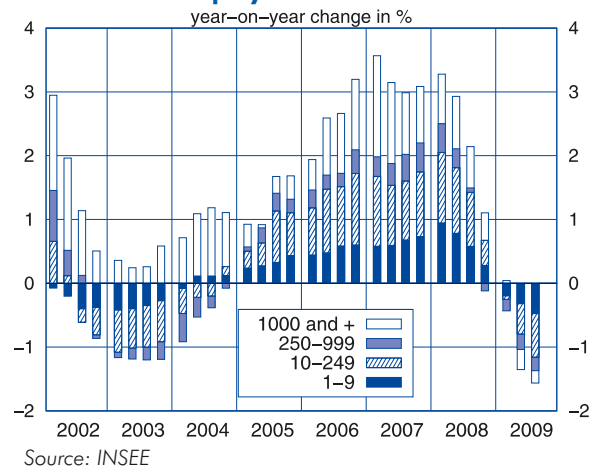


Source: INSEE

18 - Employment trend by size bracket in services



19 - Contribution of size brackets to growth in employment in services



All in all, several factors stand out upon observing employment flows at company levels since the beginning of the 2000s.

As far as gross creation and destruction flows are concerned, results may appear somewhat counterintuitive. Indeed, one might expect job creations to pick up during peak periods of the cycle, and job destructions to increase in the troughs. Flows observed over the last ten years in France run counter to this vision. Since the year 2000, job creation dynamics appear to have weakened somewhat. They are not the cause of the rise in employment that occurred between 2004 and 2007. The latter was due exclusively to the slowdown in job destructions. Conversely, the 2008 recession started with a new drop in job creations, while destructions stabilised - that is, until mid-2009.

Differences are equally striking between company size brackets. In 2008 in particular, the drop in employment started earlier in smaller companies. Very large companies on the contrary held on to their workforce to a much greater extent during the recession, especially in the industrial sector. ■

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Box 3 - Calculating employment growth according to size bracket: not an easy task!

The situation of companies in France is a highly diverse one, from small crafts companies to large listed corporations.⁽¹⁾ Between these two extremes there is a continuum of medium sized companies. A third of total jobs are concentrated in companies of fewer than 20 employees, a third in companies from 20 to 249 and the final third in companies of over 250 employees. The distribution of employment into the three groups remained more or less stable over the period of the study. While it is relatively easy to describe and compare these categories of companies, studying employment dynamics according to company size is a far trickier task.

The challenge set by the construction of employment series according to company size is indeed an endogeneity issue: the study's variable (employment) has a direct influence on the variable that serves to categorize it (company size). In other words, how is it possible to calculate the variation in employment according to the size of the company, when the latter is directly subject to employment levels?

Several conventions are thus possible. We compare three of them in this report. Among the three solutions, the so-called "dynamic" convention is by far the best adapted as it supplies interpretable employment growth series by company size.

This solution is not specific to France. The American Bureau of Labor Statistics carried out a study on the same subject, which led it to retain the so-called "dynamic" convention for the calculation of employment series by company size.

Three tested conventions: beginning of quarter, end of quarter, and dynamic

The first possible convention, perhaps the most intuitive, is based on the employment levels at the beginning of the quarter: every quarter, the company is assigned to the bracket corresponding to its workforce at the beginning of the quarter. The growth over the

(1) The study focuses on salaried employment. We will therefore not mention companies with no paid workers.

quarter is then counted as part of the bracket. For example, when a company grows from 7 to 17 employees in one quarter, the 10 jobs created are assigned to the "1-9" bracket (see graph 1).

A second possible convention is the opposite of the previous: the bracket is chosen according to the workforce at the end of the period. In the previous example, the 10 jobs created would be assigned to the "10-249" bracket.

Finally, a third convention - probably less intuitive but which makes it possible to manage several problems - is called "dynamic" convention. Employment growth is distributed between intermediate brackets. In our example this amounts to:

- 2 job creations counted in the "1-9" bracket (increase from 7 to 9 jobs)
- 8 job creations counted in the "10-249" bracket (increase from 9 to 17 jobs)

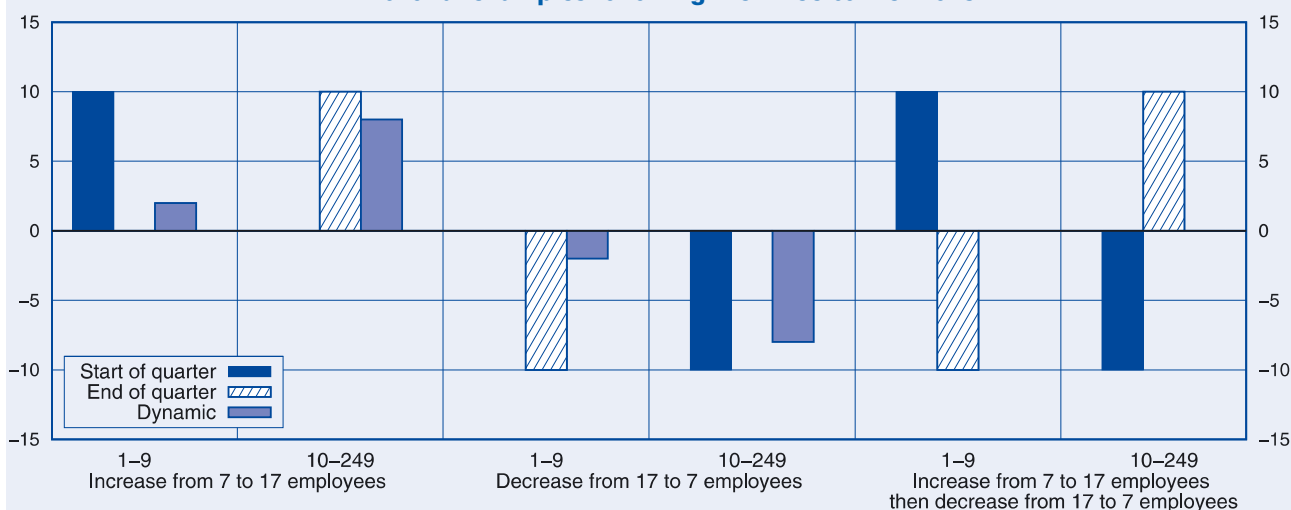
Henceforth we will label the beginning and end of quarter conventions under the generic term "static convention".

The asymmetrical aspect of static conventions blurs the analysis by size brackets

The three conventions treat companies remaining in the same bracket equally; any potential differences come from the treatment of companies having moved from one bracket to another during the quarter. The dynamic convention has one interesting characteristic: it is symmetrical, i.e. the increase in workforce in one company followed by a drop back to initial levels will in total have a null effect on employment in the different brackets.

Moreover, with the dynamic convention, opposite movements by two different companies in the same quarter - for example one company going from 7 to 17 and the other from 17 to 7 - cancel each other out: they have no effect on employment in both brackets. On the contrary, in the so-called "beginning of quarter" convention: 10 jobs are created in the "1-9" bracket and 10 jobs destroyed in the "10-249" bracket; for a strictly identical situation

1 - Fictional examples following the three conventions



in terms of employment, these trends are reversed in the so-called "end of quarter" convention: destruction of 10 jobs in the "1-9" bracket and creation of 10 jobs in the "10-249" bracket.

Yet these employment variations, born of the movement from one bracket to another, are much more massive than the net growth in employment (see *part 2*). Thus in 2007, in each quarter around 52,000 companies moved from bracket 1-9 to bracket 10-249, while 48,000 companies took the opposite step. The asymmetrical aspect of static conventions therefore generates a strong bias in the bracket by bracket evolution of statistical series, as bracket changes are assigned to a single category. The symmetrical aspect of the dynamic convention results in series that are less biased, as in each quarter the only element to be affected is the balance between upward and downward movements, distributed between the initial and destination categories. The specific bias of each convention is illustrated in graph 1, with the fictional example of a company going from 7 to 17 employees, and then back to 7.

The shifts between three size brackets actually observed in 2007 are reproduced in tables A1, A2 and A3. To illustrate the mechanics of each convention, we set apart companies with a growing workforce (table A1) and companies that are shedding jobs (table A2). It is thus possible to distinguish companies which remained in the same bracket from one quarter to another from those that moved into a different size bracket.

Table A1

Growing companies

average quarterly variation in 2007, in thousands

End bracket	Start bracket		
	1-9	10-249	250 and +
1-9	178.1		
10-249	50.9	188.9	
250 and +	1.1	22.0	104.4

Table A2

Declining companies

average quarterly variation in 2007, in thousands

End bracket	Start bracket		
	1-9	10-249	250 and +
1-9	-158.5	-46.3	-2.8
10-249		-158.0	-17.8
250 and +			-83.7

Source: INSEE

Table A1 should be read as follows: 178,000 jobs were created by companies that remained in the "1-9 employees" bracket; 51,000 jobs were created in companies that moved from the "1-9" bracket to the "10-249" bracket; and, to a more limited extent, 1,100 jobs were created by companies that grew from the "1-9" bracket straight to the "250 and +" bracket (see *table A1*).

We then aggregate the data from tables A1 and A2 to obtain net employment flows by company category, taking into consideration any potential bracket changes (see *table A3*). The table diagonal supplies the growth in employment in stable companies, those that remained in the same category: net job creations are evenly distributed between the categories. The sum of the columns of table A3 gives the evolution of employment per bracket, in the "beginning of quarter" convention; the sum of the table's rows makes it possible to reconstruct employment growth per bracket, according to the "end of quarter" convention. Results per category are very different, as category changes have a massive effect between both conventions.

However, the dynamic convention, which manages increases and decreases symmetrically, offers much more nuanced results per size bracket. In 2007, during the employment boom, all size brackets created jobs in similar proportions. This is perfectly in keeping with the stability of the structure of employment by company size.

The asymmetry of the two first conventions does therefore not make it possible to know in what size categories jobs were created or destroyed, as the analyses are different, even opposite, from one convention to the other. We will see that this asymmetry also disrupts the diagnosis of employment trends which is the aim of this study.

Table B

Employment trends with the dynamic convention

average quarterly variation in 2007, in thousands

	Companies		Total
	Decrease	Increase	
1-9	-173.8	194.9	21.1
10-249	-197.1	231.4	34.3
250 and +	-96.3	119.2	22.8

Source: INSEE

Table A3

Total = (A1) + (A2)

End bracket	Start bracket			Total (end of quarter convention)
	1-9	10-249	250 and +	
1-9	19.6	-46.3	-2.8	-29.5
10-249	50.9	30.9	-17.8	63.9
250 and +	1.1	22.0	20.6	43.8
Total (start of quarter convention)	71.6	6.6	0.0	78.2

Scope: excl. temporary workers and GEN (see box 1).

Source: INSEE

The asymmetry of static conventions also disrupts the diagnosis of employment trends

Starting with the results highlighted in table A3, we calculate for each size bracket the shift in employment corresponding to the beginning convention and the shift in employment corresponding to the end convention (see table C). This gap measures the bias relative to the asymmetry of both conventions. For example, for the "1-9" bracket, the bias is equal to the 71,600 employees from companies that moved up into the next bracket in one quarter, from which we subtract the 29 500 employees lost by companies coming from a higher bracket.

This bias is not constant over time (see graph 2). The variations in employment trends are combined with disruptions specific to the measurement conventions. These disruptions are due to the asymmetry of the flows between size brackets, depending on whether the current period is one of employment growth or decline (see part 2). Thus, the slowdown in employment often

goes hand in hand with a slowdown in upwards as well as downwards movements. In other words, the flow of workforces moving into the bracket above in periods of employment growth is, in absolute values, higher than the flow of workforces moving into the bracket below in periods of decline. As the bias of static conventions evolves over time, its instability does not make it possible to carry out a diagnosis of employment trends. From this point of view too, the dynamic convention is most relevant. ■

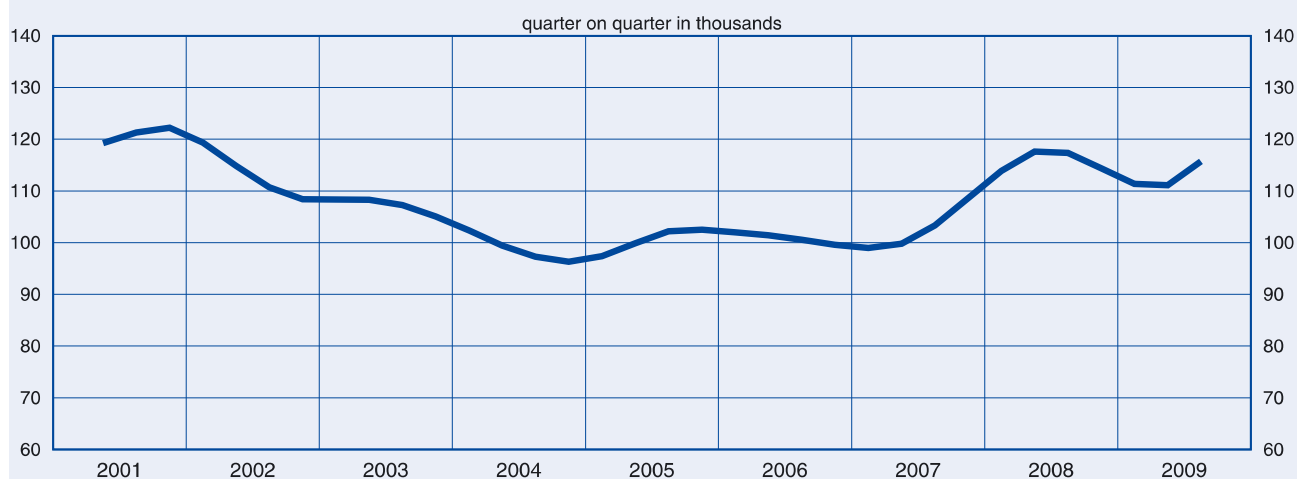
Table C

Bias between conventions

in thousands			
	Start of quarter convention (a)	Start of quarter convention (b)	Bias (a-b)
1-9	71.6	-29.5	101.1
10-249	6.6	63.9	-57.3
250 and +	0.0	43.8	-43.8

Source: INSEE

2 - Static convention bias is not constant over time



Source: INSEE