

Will corporate investment take off again in France in 2014?

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For 2014, an economic upswing seems likely across the Eurozone in general, and in France in particular, but the pace will depend mainly on the change in corporate investment. In France, however, this decreased in 2013 for the second year running (-1.8%, after -1.9% in 2012). Some analysts fear that investment will be slow in taking off in France for several reasons: they believe that France as a whole is no longer competitive, that companies do not have the means to invest because of the drop in their margin rate since 2008 and the tightening of bank credit and lastly, companies seem to be able to meet new demand with the capacity they already have and which is currently not required.

The purpose of this report is to assess how relevant these different arguments are, especially in view of corporate investment performance in France since the beginning of the 2000s. From the points presented here, the following conclusions can be drawn:

- in France, apart from cyclical variations, the corporate investment rate has increased slightly since the end of the 1990s. Today its level is above its average, although this is probably the low point of the cycle. This upward trend, which in volume is even more pronounced given the falling trend in prices in relation to investment, can be compared with the significant drop in the cost of corporate financing since the beginning of the 1990s;

- since 2008 in particular, corporate investment seems to have stayed aligned only to fluctuations in demand, as if the others unfavourable factors (fall in margin rate, credit squeeze, uncertainty over business prospects in the medium term) had been offset by favourable factors such as low cost of corporate financing and, to a lesser degree, investment support measures taken since 2008 (abolition of the professional tax, extension of the research tax credit, assistance with cash-flow for companies in difficulty at the peak of the crisis, credit mediation);

- furthermore, since the beginning of the 2000s, corporate investment in France has developed favourably compared with other European economies. In Germany, the United Kingdom, Italy, Spain, the investment rate (as a ratio of value added) is today between 2 and 7.5 points lower than the 2000 level, whereas in France it is the same;

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- if we look only at investment excluding construction, the situation in France remains favourable. From 2000 to 2007, all trends in the major European economies were similar, apart from the United Kingdom, where there was a marked drop in investment rates. Since 2007 however, adjustment in France has been less pronounced, as the drop in the other economies was two to four times greater;

- how can we account for this improved French performance since the beginning of the Recession? Compared with Italy and Spain, the reason can be found quite naturally in the fact that the crisis was on a smaller scale, especially since 2011: investment overreacted in the short term to fluctuations in activity, this is the «accelerator» effect. Performance in relation to Germany is more surprising, where the economic outlook was more favourable, external competitiveness seemed better both in terms of level and of trend, and companies were in a much more favourable financial situation. The gradual divergence, since the end of the 1990s, between labour costs in France and Germany could have led to capital/labour substitution behaviour which favoured capital in France;

- for 2014, the most likely scenario seems to be an increase in French corporate investment but at a similar rhythm to that of GDP. On the one hand, the latest available data, and also analysis of previous recoveries, give credence to an upswing in investment in the wake of activity. On the other hand, the relative resistance of investment excluding construction in recent years is unlikely to lead to a particularly marked catch-up phenomenon, and investment in construction is still showing no signs of recovery. ■

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In France, corporate investment has held up fairly well since 2008

No downward break in corporate investment rates compared with the pre-crisis average

Investment rate in a growth trend since the end of the 1990s

The corporate investment rate (i.e. investment as a ratio of value added¹⁾) moves cyclically: it increases in periods of expansion, and decreases during economic slowdowns. Since 1997 however, this cyclical dynamic has been accompanied by a slight growth trend, with the investment rate at the dip in the cycle increasing from 15.4% in 1997 to 16.3% in 2004 then to 16.9% in 2009. Thus in Q3 2013, when France was in all likelihood close to the low point in the cycle, the investment rate of non-financial enterprises (NFEs: non-financial corporations and unincorporated enterprises), calculated as the ratio of the gross fixed capital formation (GFCF) of NFEs in value to the value added of NFEs in value, reached 17.6%, higher than its pre-crisis average ² (see *Graph 1*).

If we consider the peaks, in 2007 the investment rate was 1.5 points higher than the 2000 level, even though economic growth was far less dynamic in 2007 than at the end of the 1990s. Although the 2011 peak was lower than that of 2007, it was nevertheless about 0.5 points higher than that of 2000.

Given the falling trend in the relative price of investment, this relative dynamism in investment as a ratio of value added since the end of the 1990s is even more marked if we look at variables in volume, deflated for prices: investment has grown by 52% since 1997, against 37% for value added. Analysis by product is modified, however.

In terms of value, this apparent trend can be attributed to the increase in rates of investment in construction and services (respectively +1.5 points and +1.0 points since 1997). Conversely, the rate of investment in manufactured goods, which is very cyclical, is today slightly lower than in 1997 (see *Graph 2*). In volume, on the other hand, investment in construction grew more slowly than value added over the period, and investment in manufactured goods increased more quickly than value added between 1997 and the present. In services, the trend in investment grew faster than value added, both in volume and in value.

This dynamism in investment since 2000 can be seen particularly clearly in services

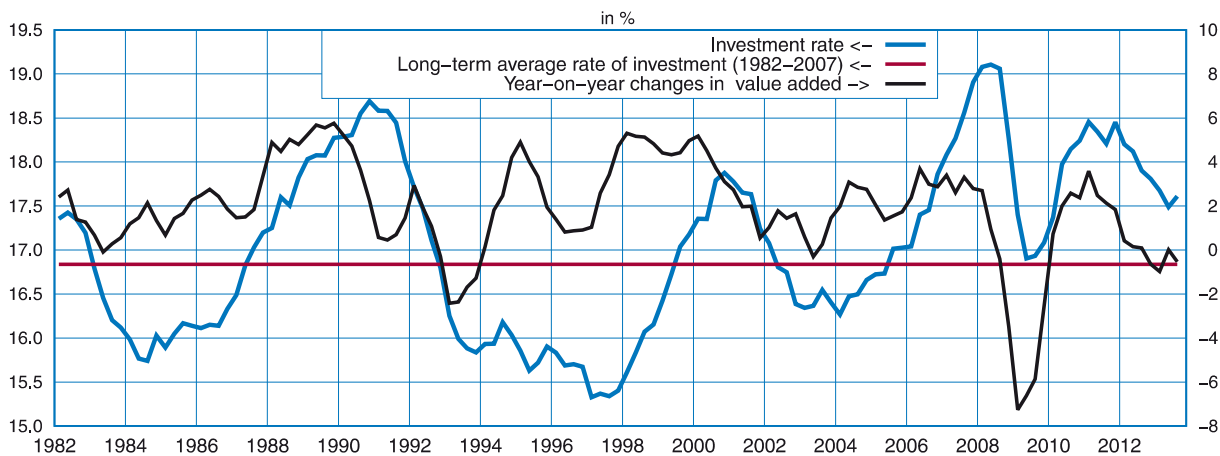
The upward trend in the NFE investment rate seen since the beginning of the 2000s can also be analysed through branches of activity (see *Graph 3*): it was driven by the dynamism of investment rates in value in companies in the manufacturing and market services branches (respectively +0.6 points and +1.6 points between 2000 and 2008), whereas in the construction branch, investment rate in value remained remarkably stable during this same period, fluctuating around 8% (a much lower level than in the other two branches). However, this value analysis should be qualified in the light of changes observed in GFCF prices and the value added in each of these branches. Thus, given the increase in the relative price of investment in relation to value added in the construction branch since the end of the 1990s, the investment rate by volume, instead of being stable, has in fact proved to be dynamic since 2000. Furthermore, relative prices in the manufacturing and services branches have seen opposite trends during this period. The diagnosis for these two branches is therefore slightly modified: while investment in volume in the market services branch has accelerated considerably compared with value added since 2000, in the manufacturing branch, it appeared until 2007 to be cyclical around a level that was at best stable. In 2012, however, it is at a higher level than in 2007 (see *Eudeline, Sklénard, Zakhartchouk, 2012*).

(1) In this report the investment rate is defined by default with value variables.

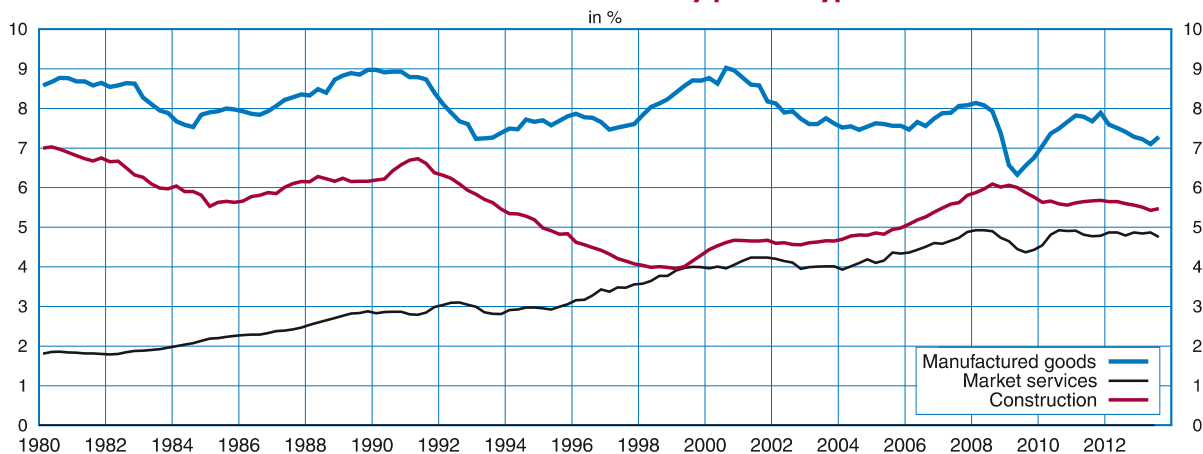
(2) 1980-2007

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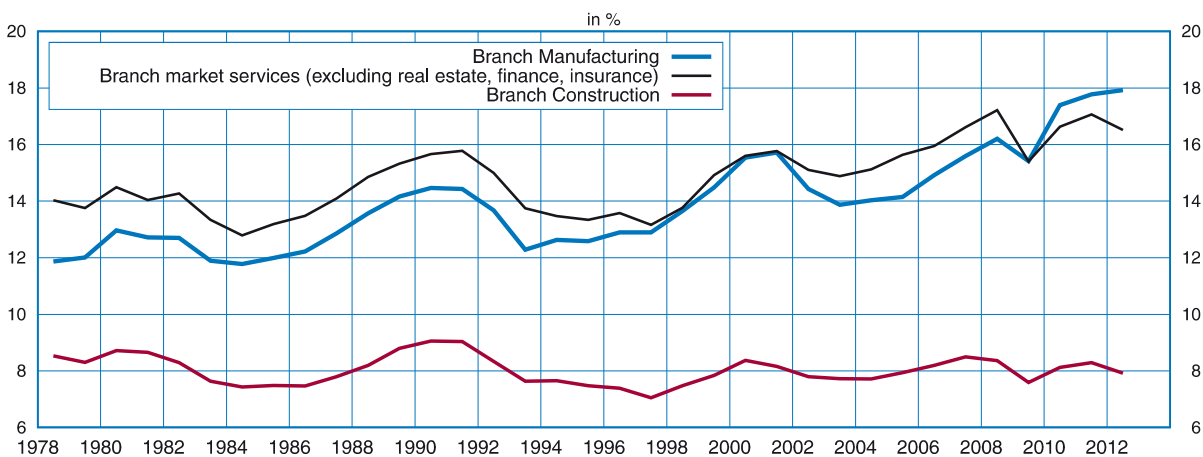
1 - Changes in the investment rate of NFEs



2 - Investment rate of NFEs by product type



3 - Investment rate by branch



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The share of investment dedicated to renewal is also in an upward trend

There is no statistical source with which to measure directly the share of investment dedicated to renewal of capital. However, several indices suggest that it is in an upward trend. Firstly, according to the INSEE's industrial investment survey, in which several thousand companies with more than 20 employees in the manufacturing branch are questioned every quarter, renewal has become the prime motivation to invest, ahead of the introduction of new products, whereas in 2000 the reverse was true (see Graph 4).

Analysis of the responses provided by companies reveals three trends. First, the share of investment by industrial companies that is dedicated to renewal has grown regularly since 2000. It has increased by 12 points, and is now the main motivation for investment. Next, investment linked with the introduction of new products decreased regularly from 2000 to 2008 (-6 points) and now seems to have stabilised.

Investment in modernisation is cyclical, with two dips in 2004 and 2010. In particular, investment in the automation of existing production processes fell slightly in favour of investment in energy savings. These trends were fairly uniform, depending on company size and branch of activity.

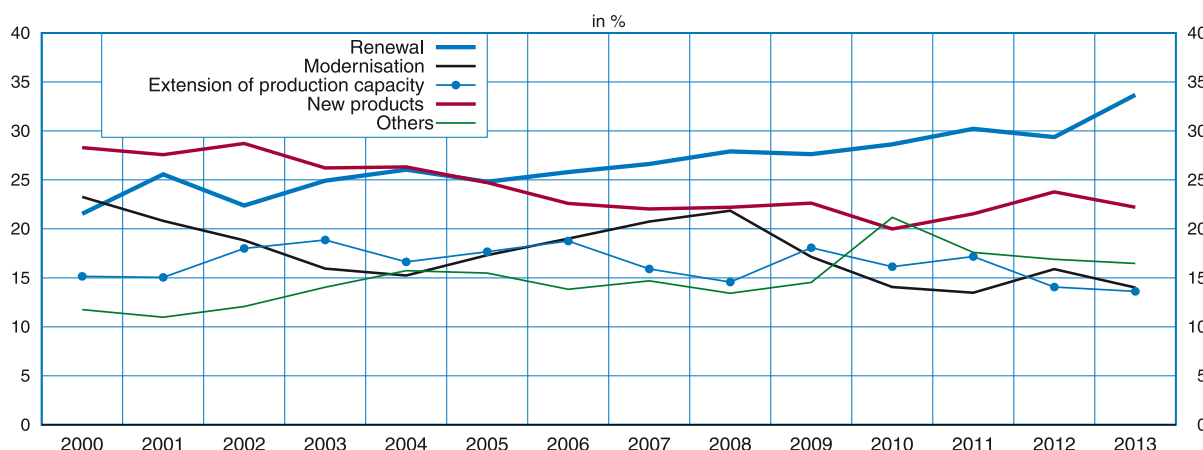
In theory, this increase in the investment share devoted to renewal, although attributable to an accelerated ageing of companies' productive capital, with an unchanged structure, may lead to a temporary rise in investment, and could help explain the slight upward trend in the investment rate since the end of the 1990s. However, there is insufficient data to validate this explanation empirically: in national accounting, the average age of assets excluding construction (approximated by the difference between amortisation and decommissioning) has shown no trend since the end of the 1990s.

More and more short-lived assets

In contrast, this increasing investment share devoted to renewal may be linked with the distortion over the last twenty years in the structure of NFE capital in favour of short-lived assets (see Graph 5). This trend of growth in the rate of investment in services is a result of the spectacular increase in investment in computers (+160%) and in software (+140%), which are amortised over an estimated five years. In contrast, investment in construction, where the amortisation period is estimated at between twenty-five and thirty years, has grown moderately, like value added (+33%).

Can the decrease in the average lifespan of assets account for the slight growth trend in the investment rate?

4 – Investment motivations according to the enterprises questioned in the INSEE Investment Survey



Source: INSEE

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The answer is somewhat negative. It is certainly true that for a given capital stock, a shorter lifespan implies a higher investment in renewal. On the other hand, however, the decrease in the lifespan of assets leads to an increase in the cost of capital, and hence modifies the production function to the disadvantage of capital, and ultimately reduces the share of investment in value added. Moreover, the distortion of the structure of NFE capital towards investment in short-lived assets is also observed in our main partners (and even more so in the United Kingdom, which is closer to the United States in terms of investment in new technologies) whereas for them the dynamics of the investment rate were less favourable, as we shall see next.

The corporate investment trend since 2007 is more favourable in France than in the other major European economies

It is in France that recent investment trends have been most favourable

The rate of investment by non-financial companies ³ in each of the five major European economies is governed first of all by the economic cycle (see Graph 6): a drop at the beginning of the 2000s then an increase until 2007, a fall in 2008-2009, a fleeting upturn in 2010, and a drop once again until the present. Yet we can distinguish some idiosyncratic forms of behaviour: the investment rate was virtually stable in Italy from 2000 to 2007; the drop at the beginning of the 2000s was particularly marked in Germany, as was the upturn from 2004 to 2008 in Spain; the fall since 2008 in Spain has been spectacular, and less so in Italy and the United Kingdom.

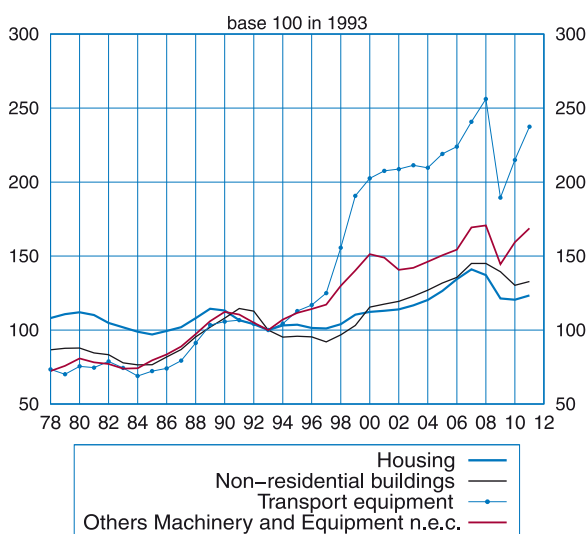
Overall, from 2000 until the present, the drop in investment rate was between 2 and 7.5 points in Germany, Italy, the United Kingdom and Spain; it was 3 points in the Eurozone and nil in France.

The situation in France since 2007 remains favourable if we consider only investments excluding construction

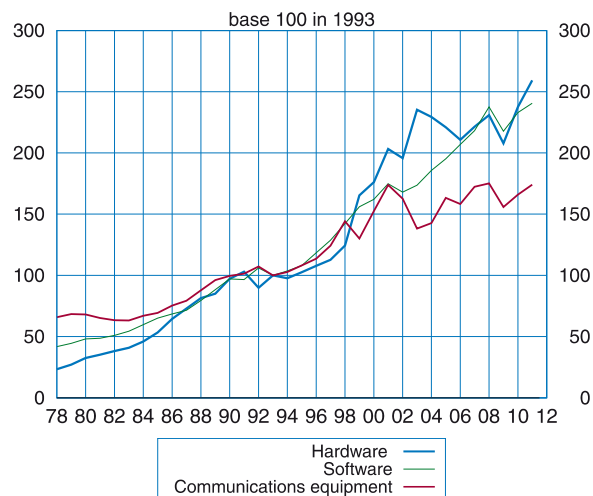
The investment rate studied previously has the disadvantage of including investment in construction, which is often considered less productive than other assets and hence less relevant in terms of investment analysis. In this part, we therefore consider investment excluding construction.

(3) European data are available only for non-financial companies, which are very similar in scope to non-financial enterprises.

5 - GFCF by asset type



Source: INSEE



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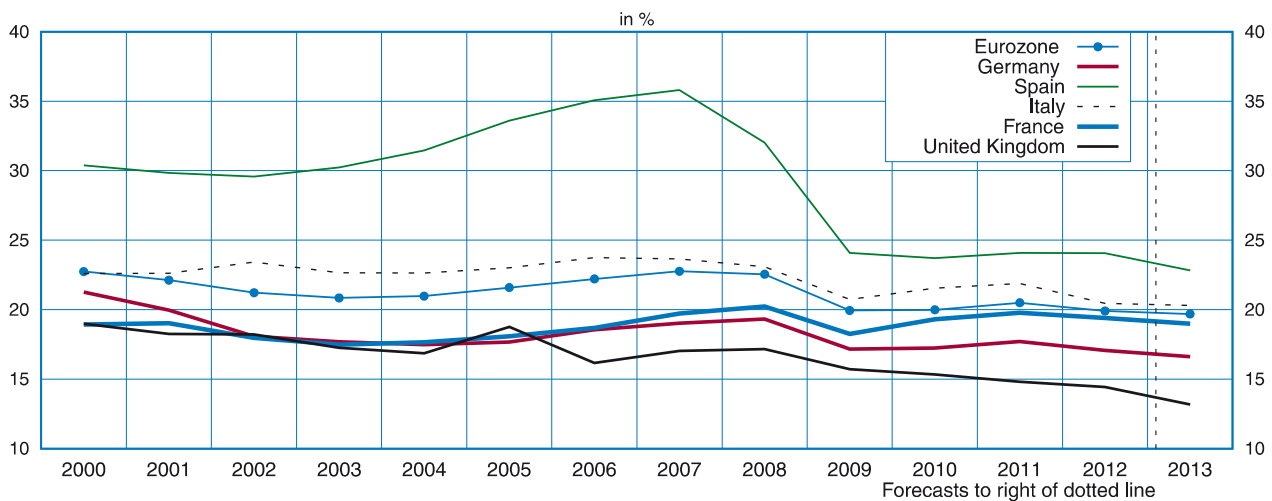
The diagnosis remains for the most part unchanged when we consider the investment rate excluding construction (see Graph 7). Overall, the drop in the investment rate since 2000 is around 1 point in France, compared with over 2 points in Germany and Spain, over 3 points in Italy, and about 4 points in the United Kingdom.

The diagnosis is the same overall if we consider variables in volume. The only notable difference is in Germany, where investment dynamics were stronger before the crisis (especially in "other machines and equipment"), with the result that from 2000 to the present, trends are more in agreement between France and Germany.

Econometric modelling confirms the resistance of French corporate investment in recent years.

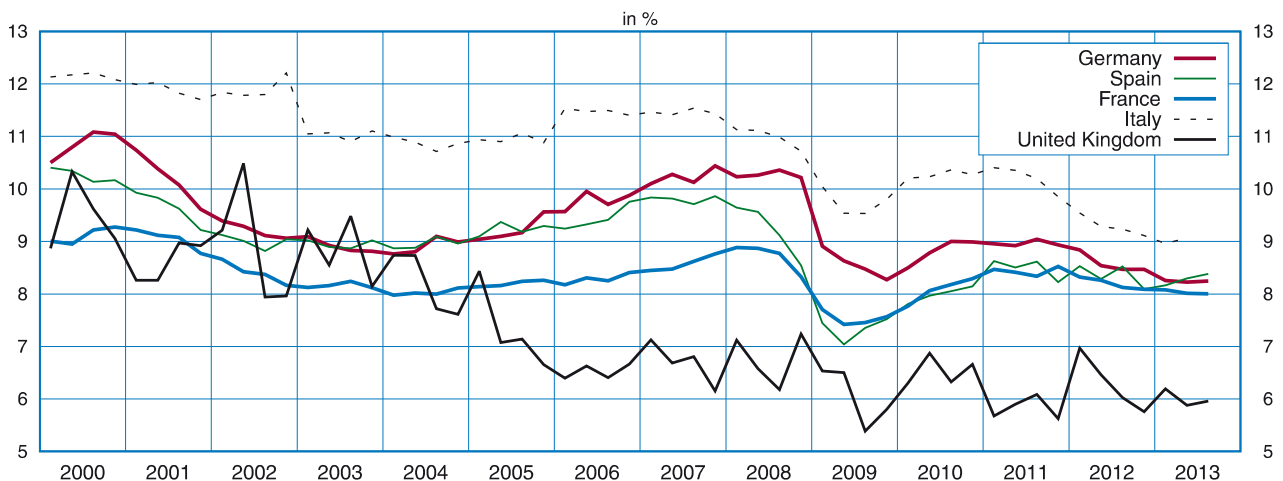
From the conclusions drawn in the first part, corporate investment as a ratio of the value added of companies seems to have enjoyed a fairly favourable dynamic over the last fifteen years, compared with our main European partners.

6- Investment rate of non-financial companies



How to read it: the investment of non-financial companies is only available in annual data and by value.
Source: Eurostat

7- Rate of non-construction investment



How to read it: the European data do not allow investment excluding construction to be isolated solely for non-financial companies.
Source: Eurostat

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Several theoretical determinants of investment: investment profitability

To confirm the robustness of this diagnosis, in this part we present the results from econometric estimates of investment which model its dynamic in the past based on its main determinants. Investment observed over the recent period is then compared to the simulations from the model, to assess whether this is "overinvestment" or "underinvestment" on the part of companies. The same exercise is then carried out for the Eurozone for comparison purposes.

When companies are not constrained either in their outlets or in their financing, the user cost of capital is the ultimate determinant of their capital ratio, in other words the relationship between their capital stock and their value added: when the yield from supplementary investment exceeds the cost of the capital, then it is profitable for the company to invest a supplementary unit of capital.

Another way of assessing investment profitability is to use *Tobin's Q*, introduced by *James Tobin*. *Tobin's Q* is the ratio between a company's stock market value and the value of its capital: if *Tobin's Q* is greater than 1, then the benefits that investment brings are greater than their cost, and it is the right time to invest. This is nevertheless a very imperfect indicator: it supposes that the stock market value is a good measure of the intrinsic value of a company, which is not always the case, especially when there is an economic "bubble" surrounding the share price, and it also assumes that the profitability of supplementary investment is indeed measured in terms of that of previous investments. For these reasons, its correlation with the level of investment is generally empirically low.

... trade outlets...

In the short term, when companies are constrained by their outlets, the main determinant of investment is demand: the stronger the demand, the more companies must invest to adapt their production capacity. However, as capital represents a large multiple of investment, if companies want to increase their capital by 1% they must increase their investment by a lot more than 1%. This is called the accelerator effect and implies that a small variation in demand leads to a larger variation in investment.

... financing constraints...

Corporate investment may also depend on constraints relating to access to finance. If a company's own resources are insufficient, then it will borrow to invest. Because banks run a significant risk that they will not be repaid, and also because they do not have all the necessary information to assess the risk of not being repaid, they may refuse to lend or will lend at very high interest rates to companies that are already heavily indebted, or which have very low profit levels. There are different characteristics that can indicate a company's state of financial health and which influence access to finance, although none is fully satisfactory: burden of debt, level of self-financing, profit level, level of margin rate.

In the estimated equation, it is the company margin rate (ratio between gross operating surplus and value added) that is used. This has the advantage of being a "proxy" both for financing constraints and for the average profitability of investments⁴. Of course the decision to invest depends on marginal profitability, and not on average profitability of the capital installed. In addition, a low margin rate can also, in certain cases, encourage companies to increase their investment effort. For example, they may increase automation of production in order to reduce wages. Empirically, however, the result is that a drop in margin rate penalises investment in France, over the estimation period.

... uncertainty

Investment depends on many constraints relating to the financial sector, demand and the health of a company. The uncertainty surrounding fluctuations in these factors also contributes to potential investment determinants. Once the decision to invest has been taken, it is often costly for a company to backtrack if the economic conditions change and make the investment unprofitable. For

(4) Also, this variable is less fragile than variables in the bottom half of the balance sheet.

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Investment in France today is slightly higher than what the determinants forecast...

example, there may be underinvestment if demand is very volatile or uncertain. This last investment determinant is very difficult to measure, which is why it has not been tested here.

Macroeconomic modelling of investment is based on error correction using an equation which takes into account the short-term adjustment dynamic towards a long-term target (see [Box 1](#)). The idea is that the investment determinants mentioned above can have a different effect in the short term (after one or more quarters) and in the long term (several years). For example, the accelerator effect implies an elasticity of demand to investment that is very much greater than one in the short term, whereas in the long term it is one.

By focusing on the area of products "excluding construction", the resistance of investment identified in the first part is confirmed: today the level of investment seems overall to be in line with its determinants, and there was even a significant rise in investment observed from 2010 to 2012, which has not been completely eliminated⁵ (see [Graph 8](#)). This result may seem surprising, as some key variables are missing from our model which should have affected investment in recent years, such as the tightening of bank credit conditions and the extreme uncertainty surrounding economic prospects, and even the future of the Eurozone in its current form.

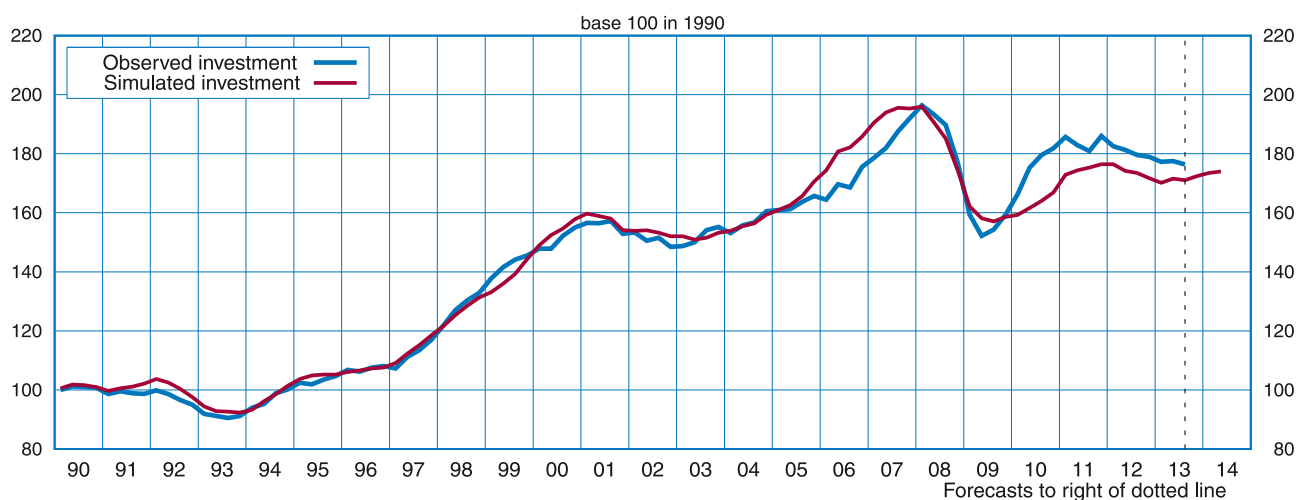
The analysis of the corporate investment rate carried out in the first part revealed an apparent upward trend since the 1990s, which may seem to contradict the result that shows that investment today conforms to its determinants. The answer, in fact, is to be found in the long-term investment determinants. If the long-term relationship of the equation is rewritten (see [end of Box 1](#)), then the investment is not supposed to evolve only like value added. It also depends negatively on the real cost of capital and positively on companies' margin rate. Lastly, it depends either positively or negatively, depending on whether investment is considered in value or in volume, on the relative price of the investment in relation to value added. The evolution of the long-term target for the investment rate, by value and by volume, is shown below (see [Graph 9](#)).

The drop in the cost of financing companies has stimulated investment

From the beginning of the 1990s until the middle of the 2000s, the cost of financing companies dropped substantially, as did the relative cost of investment, while the margin rate overall remained stable. As a result, the long-term target of

(5) However, we should remember that the 2011 data (2012 respectively) will not become definitive until May 2014 (May 2015), with the publication of the definitive accounts.

8- Investment in non-construction products



Source: INSEE, Banque de France

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Box 1 - Estimation of the "investment excluding construction" equation

We choose to model corporate investment exclusive of construction products, a choice also made in other studies¹, because the construction (30% of total investment) investment cycle is not typical of the overall macroeconomic cycle. The behaviour of investment in construction is different from the other components of investment, particularly in the 1990s (see Graph 2). It thus disrupts the estimation of corporate investment behaviour, to the extent that the investment forecast is actually better when it distinguishes investment excluding construction from investment in construction.

The long-term investment balance is the result of profit maximising behaviour among producers. We use a neo-classical framework with two factors of production (capital and labour) and a CES (constant elasticity of substitution) production function. The intertemporal profit maximisation is written:

$$\text{Max}_{K_t, I_t} \left[\sum_{t=0}^{\infty} \frac{\rho^t Y_t - \omega L_t - \rho^t I_t}{\prod_{i=0}^t (1 + \beta_i)} \right]$$

under constraints :

$$K_{t+1} = (1 - \delta_t) K_t + I_t$$

$$Y_t = [\alpha K_t^\sigma + (1 - \alpha) L_t^\sigma]^{1/\sigma}$$

where:

- I_t and Y_t are investment and production in volume,
- p^X is the price of value X ,
- ω, L_t is the cost of payroll, K_t , capital,
- δ_t is the capital depreciation rate and β is the discount rate,
- $r = 1 - \frac{1}{\sigma}$ where σ is the elasticity of substitution between capital and labour.

By writing $C_t^K = \rho^t \left(1 - \frac{1 - \delta_{t-1}}{1 + \beta_{t-1}} (1 + \rho^t) \right)$ the user cost of capital,

the resolution results in the equation:

$$\ln K_t = \ln Y_t - \sigma \ln \left(\frac{C_t^K}{\rho^t} \right)$$

$$\text{where} \quad \ln I_t = \ln Y_t - \sigma \ln \left(\frac{C_t^K}{\rho^t} \right) + f(\delta_t, K_t)$$

We verify that the last term of the previous expression is stationary, hence it does not influence long-term investment. Additionally, we assume that financing constraints, approximated by the margin rate, influence investment behaviour including in the long term². In the short term³, variations in investment react to variations in value-added (accelerator effect) and to the distance from its long-term target (restoring force).

Formally, this is estimated by a two-step error correction model (ECM) with a DOLS estimation of the long-run equation (Stock and Watson 1993), which gives a less biased estimate at finite distance. As investment is a component of demand, there is an accounting relationship between investment and value-added. An instrumental variables estimation corrects the endogeneity bias. The instruments used are household consumption and exports of products from the non-agricultural market sector (NAMS).

The equation estimated over the period 1989Q4-2010Q4 is written⁴:

$$\Delta \ln I_t = -0,3 + 2,1 \cdot \Delta \ln Y_t$$

(0,15) (0,36)

$$-0,07 \left(\ln I_{t-1} - \ln Y_{t-1} + 0,6 \cdot \ln \left(\frac{C_{t-1}^K}{\rho_{t-1}^t} \right) - 3,6 \cdot Tx_marge_{t-1} \right)$$

$$+ 0,3 \cdot \Delta \ln Y_{t-1} + \varepsilon_t$$

(0,08)

where:

- I_t is investment excluding construction by NFEs in volume,
- Y_t is the value-added of the NAMS branches in volume,
- C_t^K is the user cost of capital: $C_t^K \approx \rho^t (\delta_t + \beta_t - \rho^t)$,
- ρ^t is the GFCF deflator excluding construction, ρ^t its year-on-year value and δ_t the amortisation rate of NFEs⁵,
- ρ^Y the value-added deflator,
- Tx_marge_t is the margin rate of NFEs;

As the variables entering into the long-run equation are all order one integrated, we tested for the existence of a unique cointegration relationship between them. The Johansen test validates this hypothesis. Additionally, the Shin test validates our long-run relationship at the 5% threshold.

Note that the equation's long-run relationship can be written as follows depending on whether we are interested in investment in value or in volume:

$$\ln(\rho^t \cdot I_t) = \ln(\rho^Y \cdot Y_t) - 4,81 + 0,41 \cdot \ln \left(\frac{\rho^t}{\rho^Y} \right)$$

$$-0,59 \cdot \ln \left(\frac{C_t^K}{\rho^t} \right) + 3,65 \cdot Tx_marge_t$$

$$\ln(I_t) = \ln(Y_t) - 4,81 - 0,59 \cdot \ln \left(\frac{\rho^t}{\rho^Y} \right) - 0,59 \cdot \ln \left(\frac{C_t^K}{\rho^t} \right) +$$

$$+ 3,65 \cdot Tx_marge_t$$

(1) see for example Bardaji and alii (2006)

(2) As the margin rate is non-stationary, its level cannot empirically affect investment in the short term only.

(3) The cost of capital and the margin rate are not significant in the short term in our estimations.

(4) The standard deviations are given in parenthesis.

(5) As the amortisation of NFEs is not available, we aggregate the amortisation of the market branches excluding real-estate services and financial services.

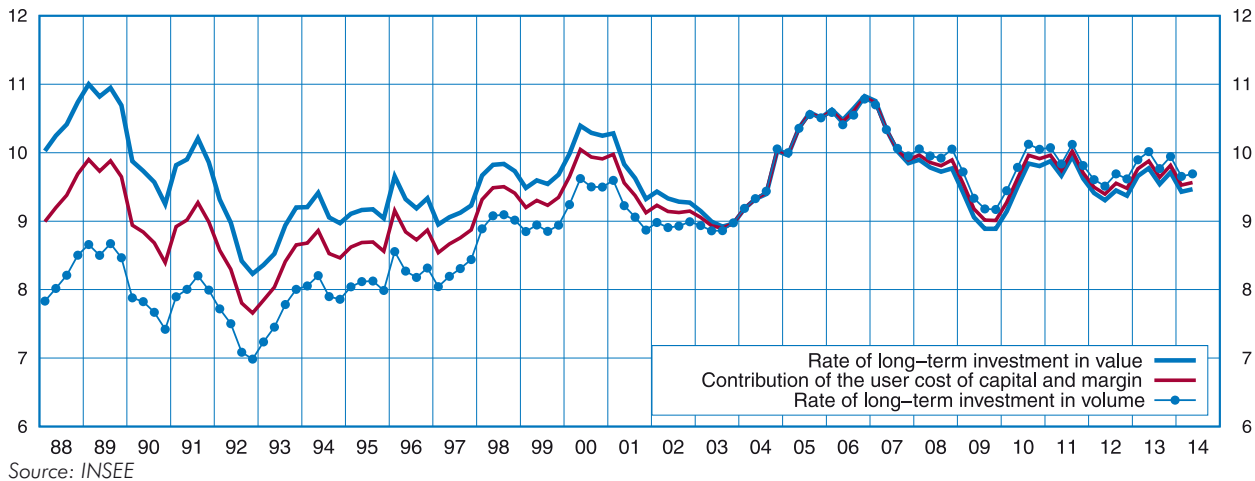
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investment in volume saw a growth trend over the period, whereas this trend was barely perceptible in value, due to the drop in the relative price of investment. The long-term target has stabilised since the middle of the 2000s, both in value and in volume, because the continuing fall in interest rates offset the fall in the margin rate, while the relative price of investment stabilised. Today, the long-term target of investment in volume remains 1.5 points higher than in the middle of the 1990s, which explains why the investment rate was higher than at the beginning of the 2000s. Thus the apparent upward trend of the investment rate can be interpreted as simply the convergence towards a new regime of higher capitalist intensity, brought on by the drop in the cost of financing companies.

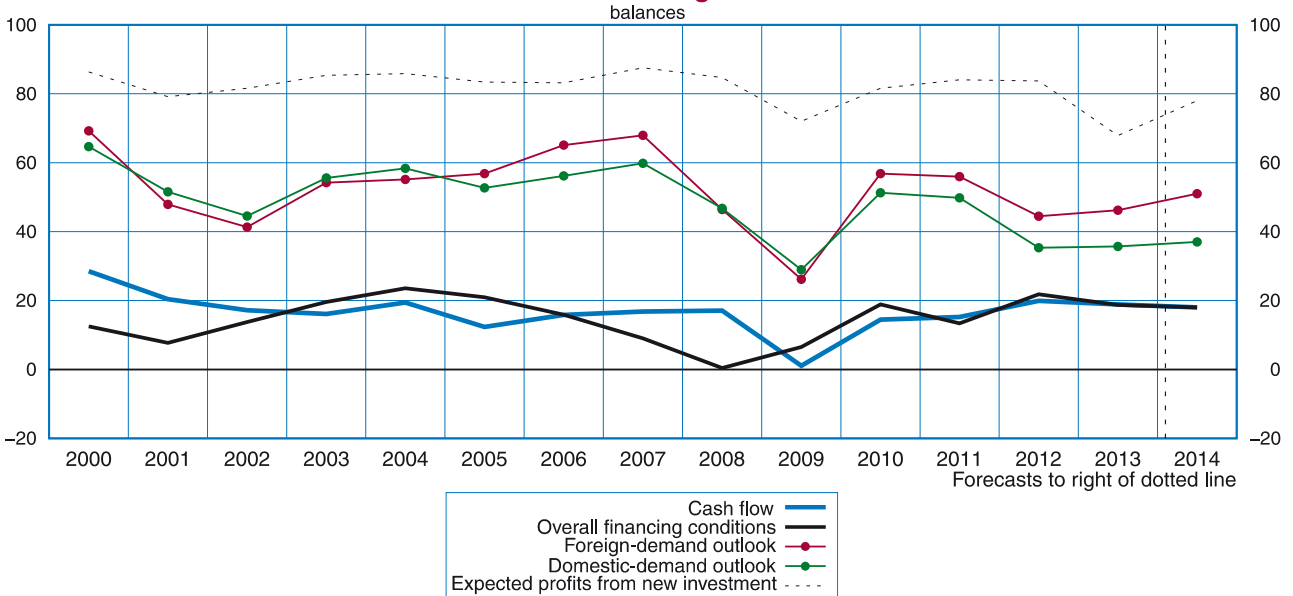
Everything is as if investment had reacted only to fluctuations in demand since 2007

The deterioration in companies' margin rate since 2007 seems to have been offset by the continuing drop in the cost of financing. On the face of it, this is a surprising result. The sharp drop in the margin rate in France in recent years, along with a drop in the equivalent savings ratio, is indicative of a deterioration in companies' financial situation and their profitability. This is likely to impact on the volume of investment.

9 – Long-term investment target excluding construction



10 – Factors influencing investment



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This result, although surprising, is nevertheless consistent with the replies companies gave to the industrial investment survey, mentioned in part one. In October every year companies are questioned on the factors that influence their decision to invest: for the current year they are asked to describe these factors as stimulative or restrictive. In 2013 the total relating to domestic demand was about 23 points lower than its 2004 level (with the difference being half this for foreign demand). However, totals for responses concerning self-financing, overall financing conditions and expected profits did not seem, initially, to be any more restrictive today than before the crisis (see Graph 10).

This result can perhaps be explained, although it is not possible to quantify their contribution, by the numerous government policy measures intended to stimulate corporate investment, directly or indirectly. First, the professional tax, which only affected capital, was abolished in 2010, and replaced by a tax on value added, which therefore not only affected capital but also labour⁶. In addition, the research tax credit was extended significantly in 2008 (removal of the ceiling, increase in credit rates, suppression of the share calculated against increased expenditure), with its cost rising in just a few years by 5 billion euros⁷. In addition, "Investment for the Future" was launched in 2010, and the amounts contractualised reached 19 billion euros in Q1 2013.⁸

The credit crunch appears to have played a secondary role in France

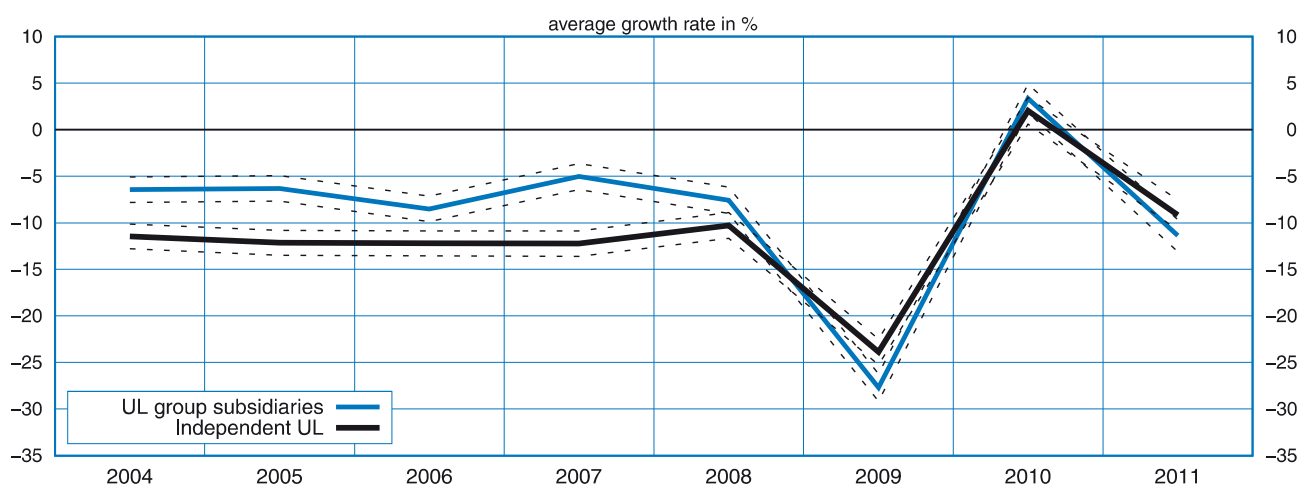
Finally, when the financial crisis was at its height towards the end of 2008 and the banks were tightening their conditions for access to credit, several measures were taken to support company liquidity (support from Oséo, reimbursement of tax debts, credit mediation, etc.), which could be considered as indirect aid for investment. Studies on French data suggest that credit constraints played only a

(6) The professional tax had already been reduced in 2006, with the revision of tax relief for new investments and the setting of a ceiling according to value added.

(7) It is true that research and development (R&D) are not recorded in investment in the national accounts, however, an increase in R&D expenditure triggers supplementary investment.

(8) Annual report on the implementation of Investments for the Future programme 2012-2013.

11- Investment growth in manufacturing



Scope: legal units (UL) submitting a return for taxation on their BRN (normal real profit) in manufacturing industry.

Definition: independent UL are enterprises which are not part of any group during the observation period.

How to read it: in 2009 in manufacturing, investment decreased by 28% on average among legal units which are affiliates of groups, against 24% among independent legal units. When the zones bordered by dashes are disjointed, these two averages can be considered as significantly different. Growth rates are defined as in Davis and Haltiwanger as $(x-x_{-1})/(0.5*(x+x_{-1}))$.

Source: INSEE, BRN (2004-2007), *Ésane* (2008-2011).

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relatively minor role in France, and would only have affected investment a little (see *Guinouard, Kremp and Randriamisaina* and also *Kremp and Sevestre*). In particular, subsidiaries of groups experienced a larger drop in activity in 2008 and 2009 than independent companies, especially in manufacturing. It was the companies that are least likely to suffer financial constraints which made most adjustments to their volume of production in the short term, and also their levels of employment and investment. These points suggest that in France companies have suffered more from a demand shock than a credit shock (see *Graph 11*).

In the Eurozone, investment is rather weaker than the determinants forecast

Econometric modelling of the Eurozone produces conclusions that are rather more nuanced than the diagnosis made in part one. Underinvestment in the Eurozone in recent years is highly dependent on the specifications and estimation period selected, as it varies from 0 to 6% (see *Graph 12 and Appendix*).

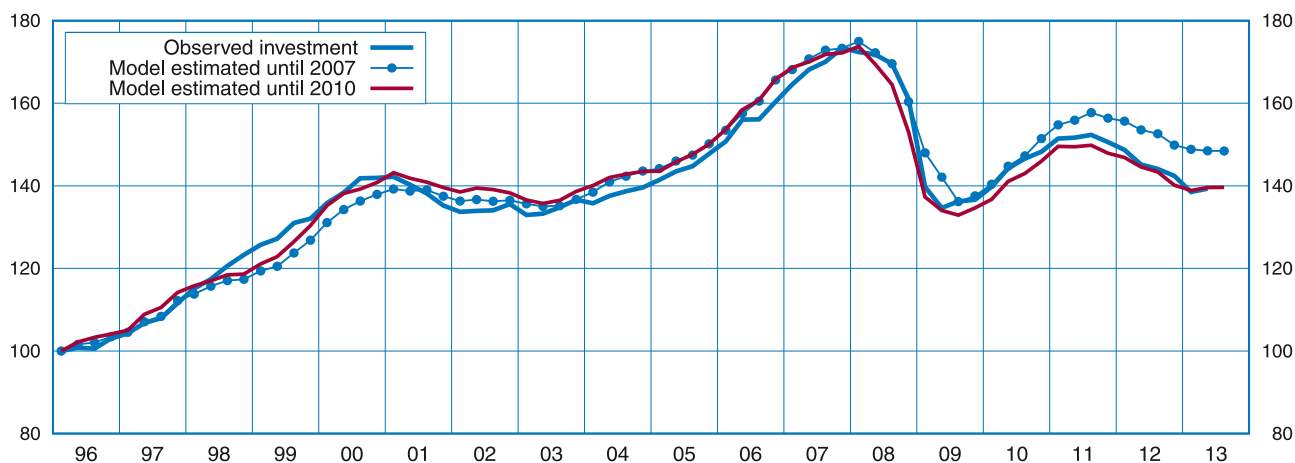
The scale of underinvestment is reduced when the equation is applied up until the end of 2010, as the extended period of weak investment from 2008 tends to diminish the restoring force towards the long-term determinants, and hence to postpone a return to the long-term target. This difference therefore appears to be temporary. However we consider it, and whatever specification and estimation period are selected, we see underinvestment in the Eurozone in the last few years, while the opposite is the case for France. As we have seen in part one, this result stems mainly from Germany, where investment declined more than in France, although the economic situation there had deteriorated less (see *Goldman Sachs Global Economics*).

Conclusion: what investment for 2014?

From the results presented in this report, the corporate investment rate seems to have experienced a growth trend since the 1990s. The reason for this is the continuous drop in the cost of financing. Since the crisis in particular, investment in France has shown more resistance than that of its European partners.

Today, economic activity appears to be picking up, both in France and in the Eurozone: the business climate has greatly improved since the beginning of the year; and year-on-year GDP at the end of 2013 will probably settle at +0.7%, compared with -0.3% at the end of 2012. Corporate investment is also showing a better trend (-0.7% expected year-on-year at the end of 2013, against -3.1% at the end of 2012), but continues to contribute negatively to growth.

12 - Investments in assets excluding construction in the Eurozone



Source: INSEE

Will corporate investment take off again in France in 2014?

Box 2 - Investment behaviour in previous recovery periods

Over the last two decades the French economy has been hit by three recessive episodes: the 1993 recession, the slowdown following the bursting of the internet bubble in 2001 and the recession of 2008-2009. Each of them can be split into two phases: a first phase in which activity declines sharply (all the components of demand contract) then rebounds (but this rebound remains partial and fragile because investment does not really pick up), followed by a second more diffuse phase in which activity deteriorates again but on a lesser scale than in the first phase. At the end of this second phase a more robust and lasting upturn emerges, accompanied by a notable recovery of investment by non-financial enterprises.

Corporate investment, a very cyclical component of demand, amplifies the short-term fluctuations in value-added according to the accelerator principle. In the recession phase, the drop in investment is larger than that in demand. In the upturn phase investment rebounds, in response to both the past over-adjustment and the anticipated improvement in demand. The last three recessive episodes to have hit the French economy show that corporate investment tends to adjust to variations in demand with a time lag, to the extent that the upturn in investment comes later than that in value-added. Hence investment has rarely been a driver of recovery in France. Other components of demand like exports have genuinely driven the recovery phases. The fact that investment is more of a follower than a driver of the cycle may be due to the fact that the investment decision is a serious one for the person who makes it: it involves installation costs (and sometimes training, organisation and adaptation costs), risk-taking in an uncertain context, an often large financial

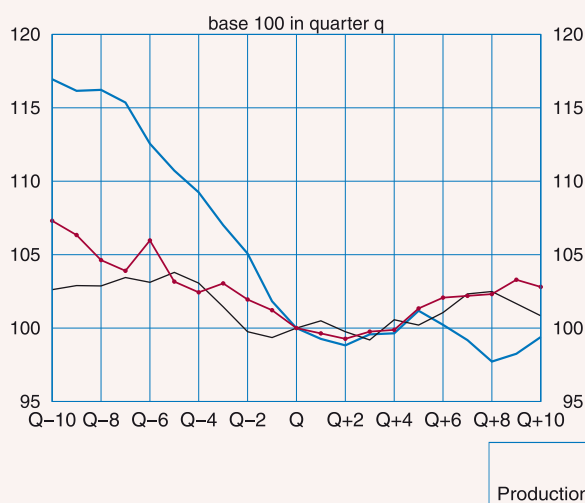
undertaking in respect to the lender (bank, shareholders...), and it is irreversible. All these constraining factors make investment a variable that only becomes dynamic once the upturn in activity has been confirmed.

In the course of the two complete recessive episodes (i.e. with the observation of the two phases described above), the investment rate in the first phase of recovery remains sluggish or may even continue to worsen after the date of recovery of activity (denoted T), before stabilising: in 1993, it started to rise again two quarters after the low point, but this trend was quickly interrupted and the investment rate fell back once again before stabilising eight quarters after the upturn in activity (see Graph 1); in 2001, it continued to fall for almost three quarters after the date of recovery before stabilising at a low level (see Graph 2). In this first phase, neither the production capacity utilisation rate nor the margin rate really improved: at best they were stable, or continued to deteriorate. In the second phase, the acceleration in investment was sharp in both episodes (see Graphs 3 and 4): the investment rate grew sharply from the first quarters following the upturn. In 1997, both the production capacity utilisation rate and the margin rate improved significantly, while in 2003 these two variables remained in a negative trend.

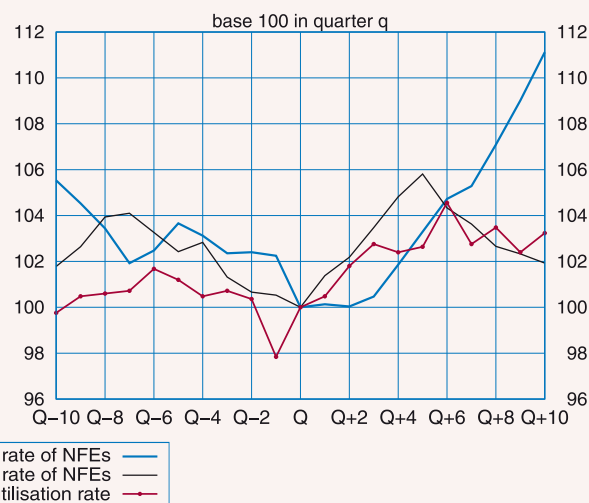
The last known recessive episode (2008-2009) differs from the other two: it is remarkable for the unusually quick response by investment to the recovery of value-added in the third quarter of 2009. The investment rate grew rapidly as early as the first quarters of recovery, as did the production capacity utilisation rate and the margin rate (see Graph 5). ■

The two phases of the recession of 1993

1 - Phase 1 recovery in quarter Q (Q= 1993Q2)



2 - Phase 2 recovery in quarter Q (Q= 1997Q1)

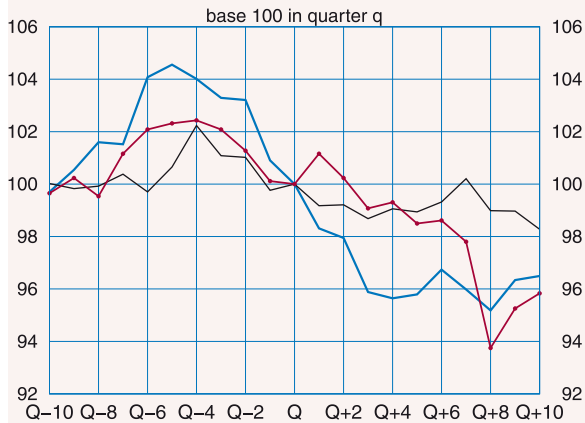


Source: INSEE

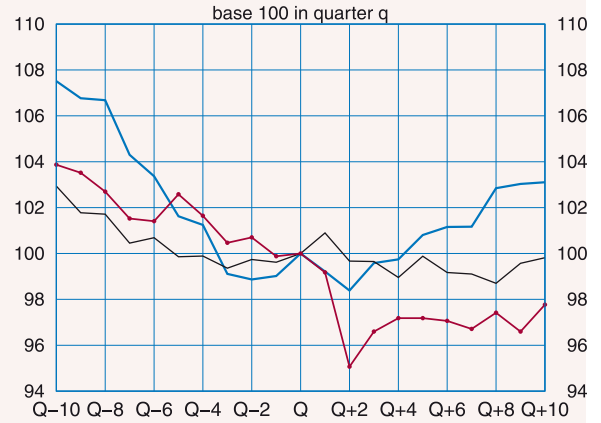
Will corporate investment take off again in France in 2014?

The two phases of the post-internet bubble slowdown

3 - Phase 1 recovery in quarter Q (Q= 2002Q1)



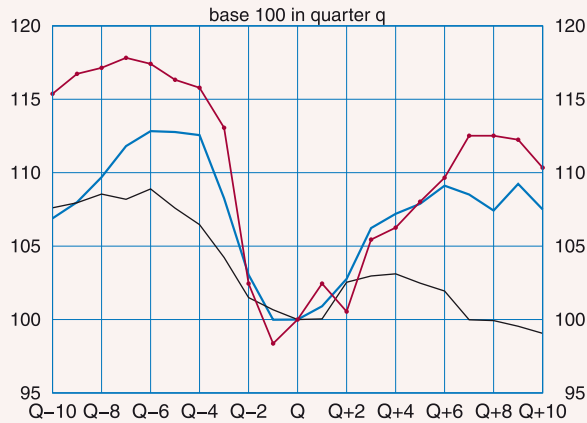
4 - Phase 2 recovery in quarter Q (Q= 2003Q3)



Investment rate of NFEs —
 Margin rate of NFEs —
 Production capacity utilisation rate —

The great recession in 2008

5 - Phase 1 recovery in quarter Q



How to read it: for the five graphs above, the three series have a base of 100 in quarter Q (Q being the first quarter with a positive GDP growth rate after each period of recession).

Source: INSEE

Will corporate investment take off again in France in 2014?

For 2014, the pace of economic recovery will depend mainly on what happens with corporate investment. There are three possible scenarios: "slow down" investment, which continues to fall; "follower" investment, which advances, but only moderately, in the wake of the recovery, and "driving" investment, with a strong rebound which will intensify the economic recovery. The "follower" investment scenario seems the most likely.

The equation forecasts a moderate upswing in investment

Using the scenario from *Conjoncture in France*, the equation estimated in the previous part forecasts an upswing in investment excluding construction over the forecasting period, albeit a moderate one (+0.8% then +0.6% and +0.3%). This dynamism should be governed for the most part by the accelerator effect: like GDP, investment is likely to rebound in Q4 before slowing.

During previous recoveries, investment was generally of the «follower» kind

The pointers to a downturn in outlook may be quite distinctive, especially because behaviours are less "mechanical" and are more in line with agents' expectations. To outline the prospects for an upturn in investment, it would be useful in addition to consider recoveries over the last twenty years (see *Box 2*). Briefly, there have been three recessionary phases (1993, 2001, 2008), each one followed by an interrupted upswing, before a more positive and more long-lasting recovery phase was installed (1997, 2003, and hence potentially 2013). The following conclusions can be drawn:

- The investment rate does not usually pick up during the quarters that follow recovery, in other words, investment increases at best with moderation, like GDP. The only exception to this rule was the 2009-2010 recovery, when the upturn in investment was very strong and very much faster than expected, given its determinants (see *part 2*). The idea that a rebound in investment is usually the driving force behind economic recoveries is not borne out in France.

- contrary to what is commonly believed, a low level of capacity utilisation rate (CUR) does not prevent investment recovery (see *Forestier*). Indeed, during past recessions, recovery systematically occurred before the CUR picked up, and usually the upturn in the CUR and the investment rate were concomitant. This was particularly true at the end of 2009: a strong recovery in investment occurred when the CUR was still at its low point. There may be several explanations for this apparently counterintuitive result, which are not necessarily exclusive. First, obviously, the CUR is an average: the CUR may be low, but this does not prevent some under-capacities on occasions. Next, during recessions, the drop in investment is such that a rebound may be necessary, just to maintain productive capacities net of amortisation. And as capital is by its very nature much more inert than investment, a strong rebound in investment can be accompanied by an upturn in CUR.

Analysis of past recessions therefore shows us firstly that investment generally "follows", and secondly that an upturn in CUR is not a necessary precondition for investment to recover.

"Slow down" investment for this recovery?

Other factors, which are difficult to quantify, could influence investment decisions, such as France's continuing loss of attractiveness, as shown in international rankings, at a time when the drop in wage costs in countries such as Spain or Ireland is restoring their attractiveness in the eyes of international investors. These factors do not seem to have come into play for the moment, since French corporate investment appears, as we have seen, to be in line with its usual determinants (demand; margin rate; user cost of capital excluding taxation). While we cannot exclude the possibility that they start to have an effect over the forecasting period, continuing with measures in favour of investment, such as the

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The most recent data substantiate an upswing in investment

national pact for competitiveness and employment, is pulling in the opposite direction. At all events, the business tendency surveys do not suggest that investment will fall away in the short term. The opposite is the case, as the most recent data give credence to an upswing in investment in the short term.

From the conclusions in the first part, corporate investment can be broken down into investment in manufactured goods, which have a very cyclical dynamic, investment in services, where the dynamic follows more of a trend, and investment in construction, which also follows cycles, but these are in principle distinct from the GDP cycles.

Over the recent period, investment in manufactured products has picked up strongly, after six quarters of marked decline, and now contributes positively to activity (+0.4% expected year-on-year by the end of 2013, after -7.4% at the end of 2012). This is a positive sign for 2014, because this variable usually follows regular cycles. Investment in services, on the other hand, which resisted very well during the crisis, was weaker in 2013, but this weakness is expected to be temporary (-1.6% expected year-on-year by the end of 2013, after +1.9%). Lastly, investment in construction should fall back less sharply in 2013 (-0.8% expected, after -3.3%), but the housing starts and building permits trends show that we cannot envisage a positive contribution in the first quarter of 2014.

In addition, the survey data are all in agreement on an improvement in the short term in investment prospects, even though a positive contribution across 2014 is not a certainty: according to the industrial investment survey, expenditure on investment is likely to fall by 2% in 2014. However, by interpreting these results as a trend, which is more reasonable given the imprecision inherent in surveys, this is a significant improvement, as the same business leaders assessed the drop in their investments in 2013 at -7%. In services, the survey is qualitative, and questions on prospects for investment only cover the next three months. However, the average total in the second half of 2013 was 5 points higher than the average in the first half of 2013.

According to the model described here, corporate investment should grow at a similar pace to GDP in 2014

Overall, for the forecast in this *Conjoncture in France*, it was decided to follow the econometric equation simulations (see part 2). First, the level of investment simulated in the equation corresponds today to the level of investment observed. Second, the equation forecast for the fourth quarter of 2013 is consistent with what the ratings announce, based on the survey data, and finally, the factors mentioned earlier (uncertainty about the future of the Eurozone, credit conditions tightening), which do not appear as explanatory variables in the equation, seem to be much less significant today than they were in 2011 or 2012, which is no encouragement to use a lower forecast than that in the equation.

Corporate investment seems set to increase moderately for the next three quarters (+0.7%, +0.2% and +0.2% are the forecasts), which would represent an overhang mid-2014 of +0.7% (same as for GDP). Investment dynamics should be very diverse, however, spread over investment in manufactured products, which is relatively dynamic (+2.4% overhang), investment in services, virtually stable (+0.4% overhang), and investment in construction, which will continue to fall (overhang -1.3%), and should therefore limit overall growth in investment. ■

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Appendix - Estimation of the investment equation for the Eurozone and Germany

It is more complex to estimate an investment equation for the Eurozone than for France, because of the availability of data. First of all, the estimation period is necessarily shorter because the data start in 1995 (although they actually started earlier, the beginning of the 1990s with the reunification of Germany was an atypical period which would disrupt estimations). Next, the construction of a cost of capital, which is fragile for France, would be even more so for the Eurozone, mainly because of the absence of homogenous amortisation series. Lastly, for the Eurozone, corporate investment is not available quarterly and the classification is not of products but of assets. Therefore the scope in which we do the Eurozone estimation (investment all agents in tangible assets excluding construction) is similar but not equivalent to that of the France estimation.

For these reasons we selected two different specifications. The first is similar to that used for France, simply replacing the user cost of capital by the price of investment. As this specification may suffer from an omitted variable bias, we consolidate our results by means of a second model of the simple accelerator type. In the long run, investment in value adjusts to value-added with unit elasticity, i.e. a target investment rate in value which corresponds to a *Cobb-Douglas* production function. For both these specifications the margin rate is not significant either in the long term or the short term.

For each specification we selected two estimations which are difficult to choose between and which mainly differ by their estimation period. The first estimation ends in 2007Q4, which is both an advantage (the differential between observed and simulated in recent years can thus be interpreted as a different pre-crisis behaviour) and a drawback (the estimation is made over a shorter period). The second estimation stops in 2010Q4. Compared to the previous estimation, the restoring force towards the long-term target is weaker, so simulated investment is lower since the start of the crisis.

Depending on the specification and the estimation period used, forecast investment is between 0% and 6% higher than investment actually observed.

Cobb-Douglas specification:

$$\Delta \ln I_t = -0,25 + 2,66 \Delta \ln Y_t - 0,09 \left(\ln I_{t-1} - \ln Y_{t-1} + \ln \left(\frac{\rho_{t-1}^I}{\rho_{t-1}^Y} \right) \right)$$

(0,08) (0,45) (0,03)

$$+ 1,78 \Delta \ln Y_{t-2} + \varepsilon_t$$

(0,47)

The equation estimated over the period 1995Q1-2007Q4 is written:

$$\Delta \ln I_t = -0,14 + 3,13 \Delta \ln Y_t - 0,05 \left(\ln I_{t-1} - \ln Y_{t-1} + \ln \left(\frac{\rho_{t-1}^I}{\rho_{t-1}^Y} \right) \right)$$

(0,06) (0,45) (0,02)

$$+ 0,21 \Delta \ln I_{t-1} + \varepsilon_t$$

(0,07)

CES specification

The equation estimated over the period 1995Q1-2007Q4 is written:

$$\Delta \ln I_t = -0,24 + 2,61 \Delta \ln Y_t - 0,09 \left(\ln I_{t-1} - \ln Y_{t-1} + 0,75 \ln \left(\frac{\rho_{t-1}^I}{\rho_{t-1}^Y} \right) \right)$$

(0,09) (0,45) (0,03) (*)

$$+ 1,18 \Delta \ln Y_{t-2} + \varepsilon_t$$

(0,60)

The equation estimated over the period 1995Q1-2010Q4 is written:

$$\Delta \ln I_t = -0,18 + 2,80 \Delta \ln Y_t - 0,06 \left(\ln I_{t-1} - \ln Y_{t-1} + 0,70 \ln \left(\frac{\rho_{t-1}^I}{\rho_{t-1}^Y} \right) \right)$$

(0,08) (0,36) (0,03) (*)

$$+ 1,26 \Delta \ln Y_{t-1} + \varepsilon_t$$

(0,47)

where :

- I_t is investment in assets, plant and transport equipment in volume,
- Y_t is the gross domestic product of the Eurozone,
- ρ_t^Y and ρ_t^I the value-added and investment deflators

For each model the *Elliott-Rootenber-Stock* test rejects the non-stationarity hypothesis of the long-term residual at the 5% threshold, and confirms that variables I_t and Y_t are order one integrated.

Our Eurozone investment models indicate that the zone has been in a situation of slight underinvestment since 2011. This underinvestment is mainly due to weak investment in Germany, as the models presented below demonstrate.

With German data the cost of capital does not feature significantly in the estimations, so we replace it by the price of investment, in the same way as with the Eurozone estimations. The long-term unconstrained estimation features a coefficient of the price ratio which is not significantly different from 1, in other words the production function would be of the *Cobb-Douglas* type. Unlike the overall Eurozone, the models estimated in this way until 2007 or 2010 provide an identical estimation of the scale of underinvestment (14%). This is as high as the accelerator coefficient is relatively low (1.45, against 2 for France and 3 for the Eurozone), to the extent that the simulated value is less affected by the deterioration in recent years. The equation estimated over the period 1995Q1-2007Q4 is written:

$$\Delta \ln I_t = -0,16 + 1,45 \Delta \ln Y_t - 0,08 \left(\ln I_{t-1} - \ln Y_{t-1} + 0,88 \ln \left(\frac{\rho_{t-1}^I}{\rho_{t-1}^Y} \right) \right)$$

(0,09) (0,36) (0,05) (*)

$$+ 0,13 \Delta \ln I_{t-1} + \varepsilon_t$$

(0,13)

The equation estimated over the period 1995Q1-2010Q4 is written:

$$\Delta \ln I_t = -0,16 + 1,45 \Delta \ln Y_t - 0,08 \left(\ln I_{t-1} - \ln Y_{t-1} + 1,06 \ln \left(\frac{\rho_{t-1}^I}{\rho_{t-1}^Y} \right) \right)$$

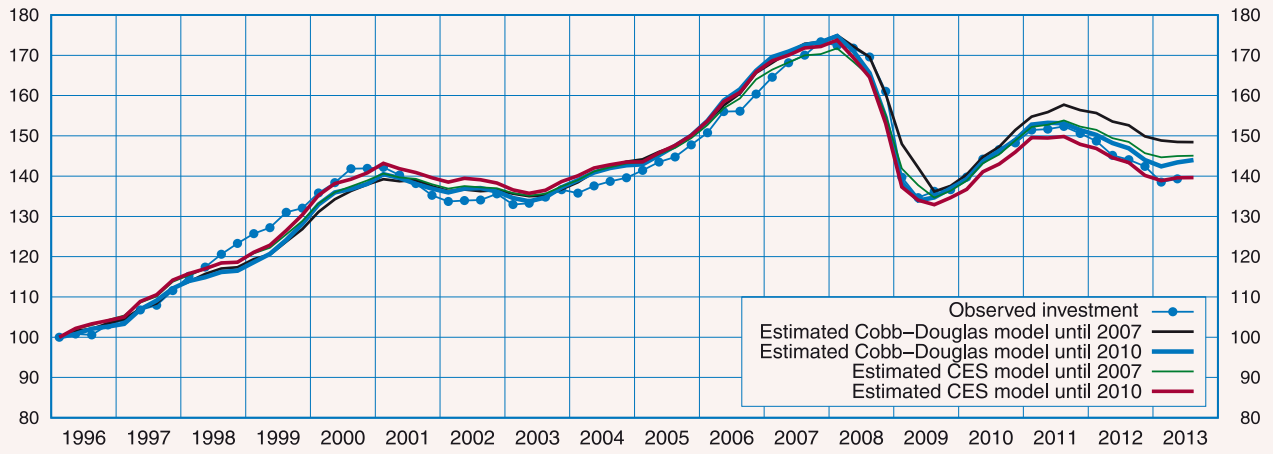
(0,09) (0,36) (0,05) (*)

$$+ 0,2 \Delta \ln I_{t-1} + \varepsilon_t$$

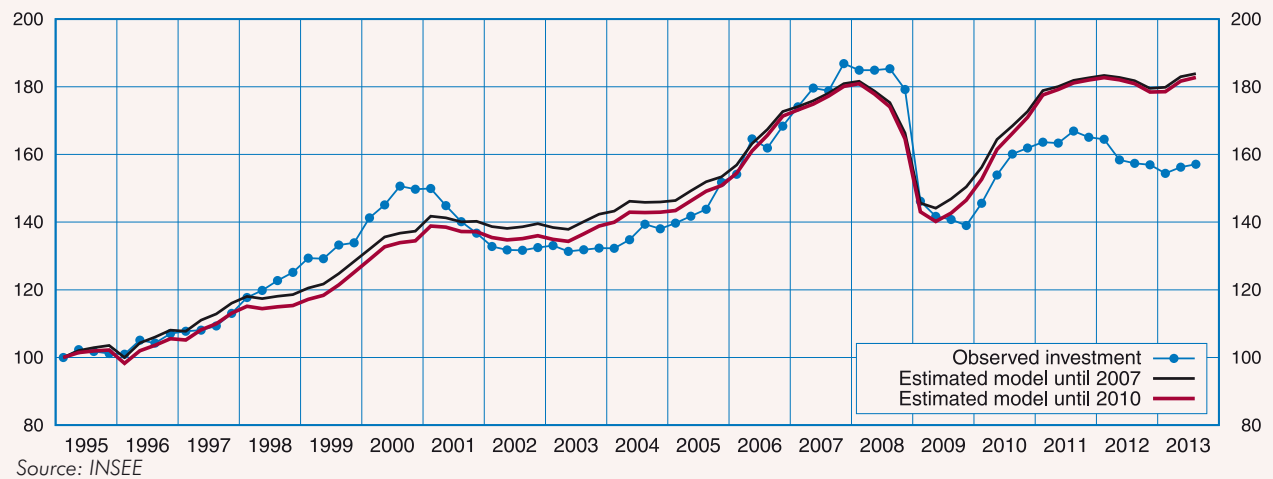
(0,10)

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GFCF in active equipment and materials transport: Eurozone



GFCF in transport equipment and materials: Germany



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