



## Productive capital operating times increased sharply in 2017

### Findings of the annual Banque de France survey

Productive capital operating times (COT) grew more in 2017 than in the previous year (up 3.7%, compared with a 1.6% increase in 2016), particularly in the transport equipment sector.

The average increase in COT observed in 2017 highlights the constraints faced by businesses trying to expand their activity. For example, more than 40% of businesses stated that certain obstacles prevented them from extending COT, the most important of which was the shortage of skilled labour.

Lastly, the extra depreciation allowance for tax purposes – the 2017 COT survey focus – led to more than 21% of businesses making capital investments sooner than originally planned following its introduction in 2015. Almost 12% of businesses surveyed say that they had been encouraged to increase their investments, with the increase in the value of investments amounting to around 18% following this French government measure.

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JEL codes  
D21, D24  
J21, J23

**3.7%**

average increase in COT in 2017

**86%**

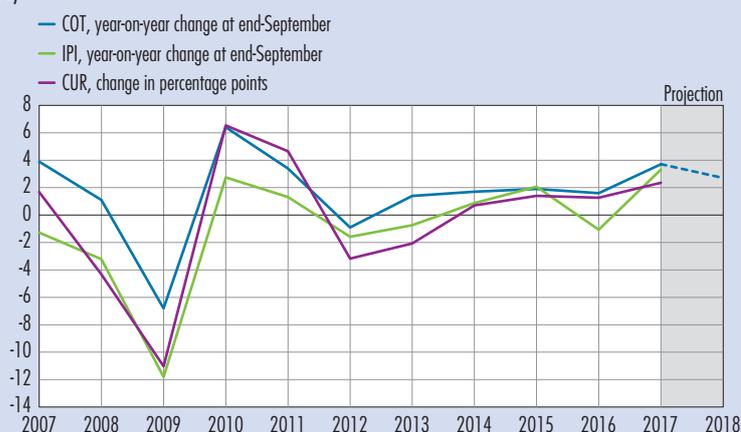
proportion of businesses stating that skilled labour shortages are an obstacle to extending their COT

**11.8%**

proportion of businesses encouraged to increase investment following the measure to boost productive investment

### Capital operating time (COT), industrial production index (IPI) and capacity utilisation rate (CUR) in the manufacturing industry

(%)



Sources: Insee (IPI) and Banque de France (COT, CUR).



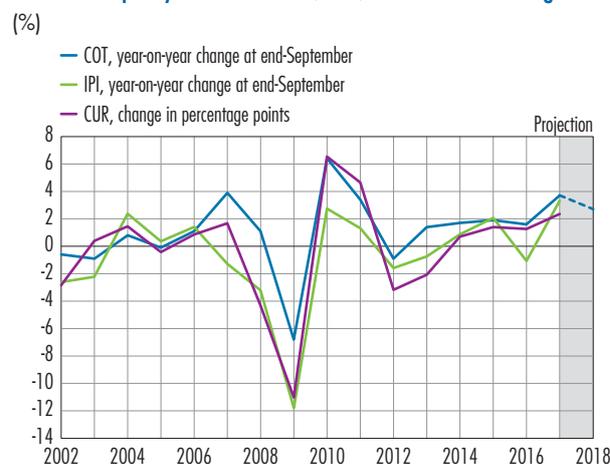
## 1 Capital operating times continued to increase in 2017

The Banque de France's productive capital operating times (COT)<sup>1</sup> survey provides data on the adjustments made by businesses to respond rapidly to changes in demand without resorting to new investments.<sup>2</sup> The survey was recently used by Cette, Lecat and Jiddou (2016) to study production factor (capital, labour) adjustment and use (labour working time, COT, capacity utilisation rates) and thereby examine the impact of obstacles to extending COT on this adjustment path. The authors notably show that when faced with a demand shock, businesses first adjust via their capacity utilisation rate and capital operating times, and then later adapt their labour and capital stock.

### A significant rise in COT in line with industrial activity

In 2017, manufacturing firms' capital operating times increased on average at a more elevated pace than in the previous year. In a context of growth recovery (GDP was up 1.9% in 2017 after an increase of 1.1% in 2016, according to Insee figures), COT grew on average by 3.7% in 2017, after increases of 1.6%

## C1 Capital operating time (COT), industrial production index (IPI) and capacity utilisation rate (CUR) in the manufacturing industry



Sources: Insee (IPI) and Banque de France (COT, CUR).

and 1.7% in 2016 and 2014, respectively (see Chouard et al., 2017, 2016 and 2015).

Changes in COT, measured every September by the Banque de France, are linked to changes in industrial activity. Manufacturing output was more buoyant in 2017 than in 2016 (see Table 1), and this change in productive activity was accompanied by a sharper increase in COT in 2017 than in 2016, in line with the capacity utilisation rate (see Chart 1).

## T1 Changes in manufacturing industrial output and COT by business size and industry sector

(year-on-year change in September, %)

|  | Manufacturing industrial output |       |      |      |      |      | Capital operating time |       |      |      |      |      | Proj.<br>2018 |
|--|---------------------------------|-------|------|------|------|------|------------------------|-------|------|------|------|------|---------------|
|  | 2007                            | 2009  | 2012 | 2015 | 2016 | 2017 | 2007                   | 2009  | 2012 | 2015 | 2016 | 2017 |               |
| Manufacturing industry   | -1.3                            | -11.8 | -1.6 | 2.1  | -1.1 | 3.3  | 3.9                    | -6.8  | -0.9 | 1.9  | 1.6  | 3.7  | 2.7           |
| By business size   |                                 |       |      |      |      |      |                        |       |      |      |      |      |               |
| SMI (20 to 499 employees)  |                                 |       |      |      |      |      | 4.1                    | -5.4  | -0.4 | 2.2  | 2.5  | 3.3  | 3.7           |
| LF (500 employees or more)                                       |                                 |       |      |      |      |      | 3.7                    | -8.4  | -1.5 | 1.5  | 0.4  | 4.2  | 1.5           |
| By business size   |                                 |       |      |      |      |      |                        |       |      |      |      |      |               |
| Agriculture and manufacture of food products (C1)                | 0.1                             | -0.2  | -1.0 | -0.1 | -0.6 | -0.6 | 3.3                    | 2.2   | 2.5  | 1.0  | 2.3  | -0.5 | 3.7           |
| Electrical, electronic and computer equipment and machinery (C3) | 0.5                             | -24.5 | -3.5 | 5.8  | -4.6 | 3.3  | 4.3                    | -7.3  | 1.8  | 3.4  | 2.1  | 4.4  | 3.7           |
| Transport equipment (C4)   | -6.1                            | -5.9  | -5.7 | 4.6  | -0.4 | 8.8  | 7.0                    | -11.7 | -7.3 | 0.8  | -0.7 | 8.0  | 0.2           |
| Other manufacturing (C5)   | -0.9                            | -11.7 | -0.2 | 1.1  | -0.3 | 3.2  | 3.2                    | -7.2  | -0.8 | 1.9  | 1.9  | 3.3  | 2.9           |

Sources: Insee (IPI) and Banque de France (COT survey).

Note: "C1", "C3", "C4" and "C5" are summary economic classifications used by Insee.

Scope: Industrial and manufacturing firms with 20 employees or more.

<sup>1</sup> For the purpose of this bulletin, average COT corresponds to the number of hours equipment is used in a week.

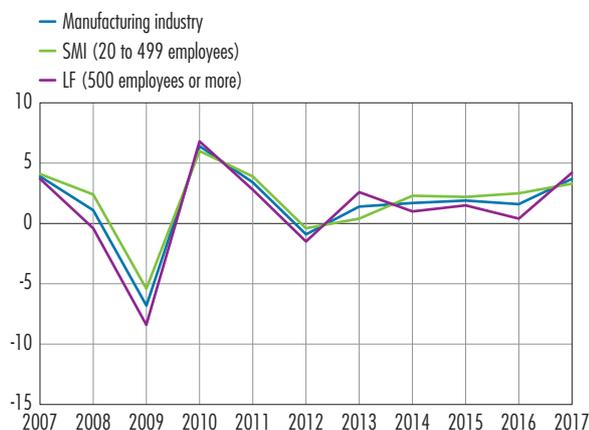
<sup>2</sup> The COT survey is the only survey in France that targets capital operating times. The businesses surveyed answer the question, "What is the variation in your productive capital operating times between the reference week in 2017 and the reference week in 2016?" See also methodological appendix.



### C2 Changes in COT

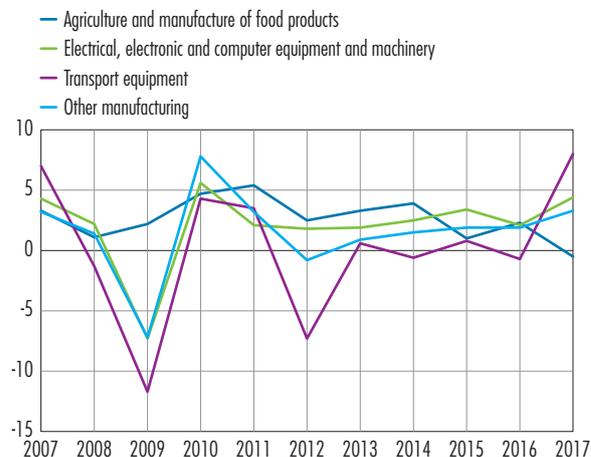
(year-on-year change, %)

a) by business size



Source: Banque de France, COT survey.

b) by industry sector



Although COT decreased in 2017 in agriculture and manufacture of food products, it increased in the other sectors, with a particularly steep rise in the transport equipment sector. Broken down by business size, large firms reported an average increase in COT of 4.2%, which was higher than the 3.3% increase noted by small and medium-sized industries (SMIs, with less than 500 employees) – see Table 1 and Charts 2a and 2b.

Business leaders expect COT to rise further in 2018, by 2.7% (see Table 1), and both SMIs and large firms also expect COT to increase, by 3.7% and 1.5%, respectively. All sectors foresee an increase in 2018.

To lengthen productive capital operating times and thus the use of capital stock, businesses can extend their

employees' working time, or reorganise production with several operators from a team working shifts at the same post.

### Reliance on shift work continues to increase

The use of teams of shift workers<sup>3</sup> has continued to increase across the manufacturing industry as a whole since 2014, affecting almost 45% of total staff in 2017 (compared with 42% in 2014). Certain businesses have made upward adjustments to their COT by modifying working arrangements, with small and medium-sized industries in particular expanding their use of shift work (see Chart 3a). It has developed significantly in agriculture and manufacture of food products but declined in the transport equipment sector (see Chart 3b).

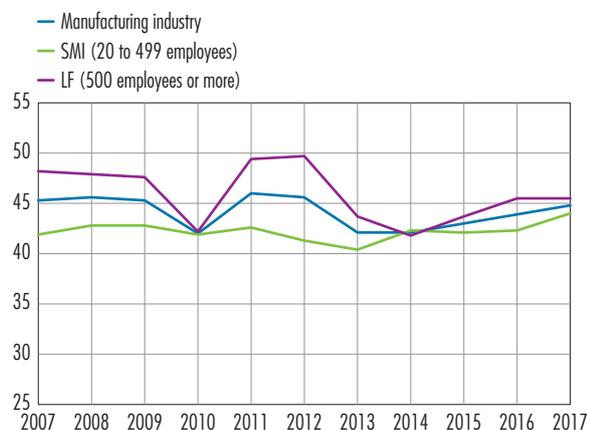
<sup>3</sup> Successive work teams are deemed to be working arrangements under which the same post or group of posts is occupied on a rotating basis by different employees belonging to separate teams. Additional end-of-week shifts are included – see methodological appendix for further details on shift work.



### C3 Changes in shift work

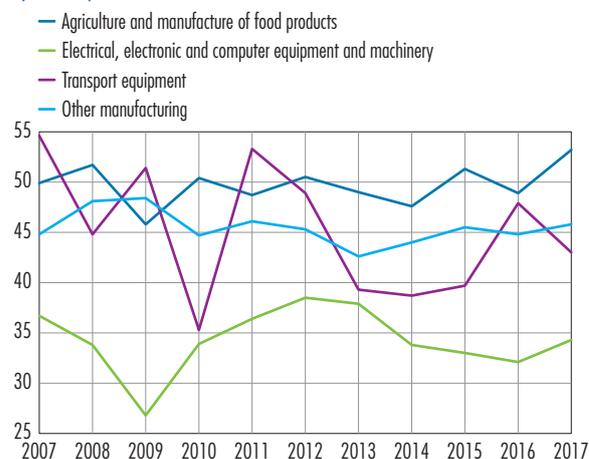
(% of total staff)

a) by business size



Source: Banque de France, COT survey.

b) by industry sector



### A slightly longer labour workweek in 2017

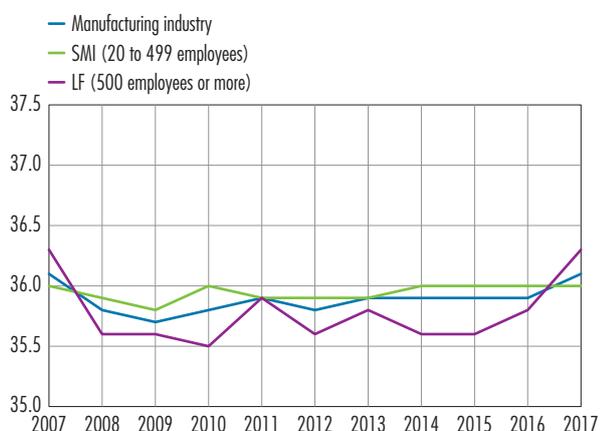
Businesses can extend their COT by lengthening the working week. In 2017, the average labour workweek in large firms was 36.3 hours, which was only very slightly longer than in SMIs (36.1 hours).<sup>4</sup> On the whole, the average working time of the businesses surveyed

was slightly up on 2016 at 36 hours (see Chart 4a). Broken down by industry sector, the average labour workweek was lengthened in the agriculture and manufacture of food products and transport equipment sectors, but shortened in the electric, electronic, and computer equipment and machinery sector (see Chart 4b).

### C4 Changes in working time

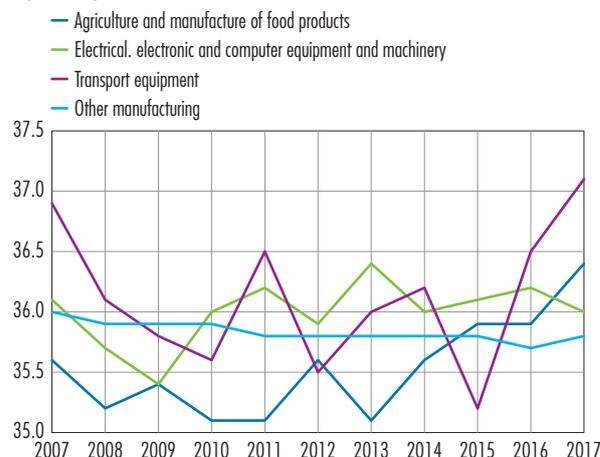
(workweek in hours)

a) by business size



Source: Banque de France, COT survey.

b) by industry sector



<sup>4</sup> According to the *Activité et les conditions d'emploi de la main-d'œuvre* (Acemo – workforce activity and working conditions) survey conducted by Dares, a French government department for research, studies and statistics, the average collective labour workweek in industry as a whole amounted to 35.7 hours at end-September 2017, slightly up on the September 2016 figure of 35.4 hours.



## 2 COT extension rigidities remain in 2017

More than 40% of businesses stated that certain obstacles prevented them from extending COT and more than half of them consider the obstacles restrictive.

In 2017, as in 2016, more than 40% of the businesses surveyed believed that they would hit obstacles or breaks if they chose to extend COT to meet stronger demand. 55% of the businesses surveyed stated that these obstacles stopped them from extending COT to the optimal level, compared with 45% in 2016 (see Table 2).

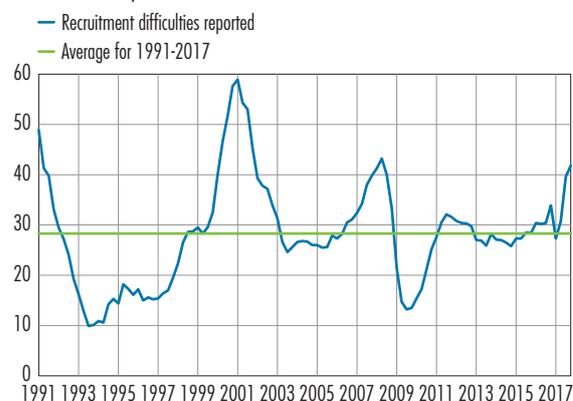
The obstacles are deemed to be most restrictive in the transport equipment sector and electric and electronic industries, with 66% and 55% of businesses affected by breaks, respectively.

### The shortage of skilled labour remains the primary source of rigidities

The shortage of skilled labour continues to top the seven obstacles to extending COT to an optimal level (see Table 3). In fact, the proportion of industrial firms restricted by difficulties in recruiting skilled staff (according

## C5 Difficulties recruiting skilled staff in the manufacturing industry

(% of businesses)



Source: Insee.

to Insee figures) continues to exceed the long-term average (see Chart 5).

The three most significant obstacles after the shortage of skilled labour are unchanged from last year – bottlenecks in commodities or supplies, technical obstacles and staff or union reluctance. These are then followed by company level collective agreements and sectoral arrangements and agreements.

## T2 Existence of obstacles to extending COT by business size and industry sector

(% of total staff)

| Proportion of businesses affected by breaks or obstacles    | 2016      | 2017      |
|---|-----------|-----------|
| <b>Manufacturing industry</b>                               | <b>44</b> | <b>41</b> |
| o/w consider the obstacles restrictive                      | 45        | 55        |
| <b>By business size</b>                                     |           |           |
| SMI (20 to 499 employees)                                   | 43        | 43        |
| o/w consider the obstacles restrictive                      | 45        | 51        |
| LF (500 employees or more)                                  | 47        | 38        |
| o/w consider the obstacles restrictive                      | 45        | 60        |
| <b>By industry sector</b>                                   |           |           |
| Agriculture and manufacture of food products                | 43        | 42        |
| o/w consider the obstacles restrictive                      | 45        | 50        |
| Electrical, electronic and computer equipment and machinery | 45        | 37        |
| o/w consider the obstacles restrictive                      | 43        | 55        |
| Transport equipment   | 47        | 20        |
| o/w consider the obstacles restrictive                      | 22        | 66        |
| Other manufacturing   | 44        | 49        |
| o/w consider the obstacles restrictive                      | 54        | 54        |

Source: Banque de France, COT survey.

Scope: Manufacturing industry, firms with 20 employees or more.



### T3 Obstacles to extending COT – proportions encountered by businesses

(%)

|   | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2015 | 2016 | 2017 |
|---|------|------|------|------|------|------|------|------|------|
| Shortage of skilled labour              | 56   | 50   | 50   | 56   | 49   | 50   | 74   | 81   | 86   |
| Bottlenecks in commodities or supplies  | 21   | 27   | 35   | 41   | 30   | 29   | 59   | 69   | 69   |
| Technical obstacles                     | 36   | 33   | 31   | 40   | 39   | 41   | 69   | 62   | 68   |
| Staff or union reluctance <sup>a)</sup> | 44   | 31   | 45   | 44   | 43   | 39   | 65   | 61   | 67   |
| Legal or regulatory obstacle            | 24   | 28   | 31   | 27   | 31   | 29   | 65   | 60   | 59   |
| Union position <sup>a)</sup>            | 31   | 27   | 30   | 30   | 26   | 30   | 63   | 58   | –    |
| Company-level collective agreements     | 15   | 15   | 23   | 19   | 25   | 22   | 52   | 50   | 49   |
| Sectoral arrangements and agreements    | 7    | 6    | 10   | 12   | 10   | 9    | 48   | 46   | 43   |
| Others <sup>b)</sup>                    | 7    | 7    | 12   | 13   | 7    | 11   | 46   | 43   | –    |

Source: Banque de France, COT survey.

Scope: Manufacturing industry, firms with 20 employees or more.

a) In 2017, “staff reluctance” and “union position” were combined under “staff or union reluctance”.

b) In 2017, the “others” category was removed.

### A capacity utilisation rate approaching pre-crisis levels

The businesses surveyed reported a capacity utilisation rate (CUR) of 78.4% in 2017, up on the rate of

76.3% in 2016. It is thus drawing close to its 2007 level, in line with the changes in CUR observed in the Banque de France’s monthly business surveys<sup>5</sup> (see Table 4).

### T4 Capacity utilisation rate in the COT survey and the Banque de France’s monthly business survey

(%)

|   | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|------|------|------|------|------|------|------|------|------|------|------|
| Monthly business survey CUR <sup>a)</sup> | 84.0 | 80.3 | 71.5 | 76.1 | 79.7 | 77.2 | 75.6 | 76.1 | 77.2 | 78.1 | 80.0 |
| COT survey CUR                            | 79.3 | 78.0 | 70.4 | 75.8 | 76.8 | 74.3 | 75.4 | 76.1 | 74.7 | 76.3 | 78.4 |

Source: Banque de France, monthly business survey and COT survey.

Note: COT – capital operating time; and CUR – capacity utilisation rate.

a) Annual average percentage.

<sup>5</sup> In the COT survey, the question on CUR had previously differed from the question asked in the monthly business survey but they were harmonised in 2007. The monthly business survey CUR is expressed as an annual average, while the COT survey CUR uses a different sample and corresponds to the reference week in September.



### The 2017 COT survey focus: the French government measure to boost productive investment

In 2017, the COT survey questioned businesses on the measure to boost productive investment that was implemented on 15 April 2015 for investments made until 14 April 2017. This tax benefit measure allows a business to deduct 40% of the cost price of an eligible productive investment from taxable profit. The amount is deducted on a straight-line basis over the normal period of use of the good, in addition to normal depreciation.

Three questions in the survey concern this measure.

1. Since the extra depreciation allowance was introduced in 2015, has it led you to make any capital investments sooner than originally planned?
2. Has the measure encouraged you to bring forward the timing of any capital investments?
3. Has the measure encouraged you to increase your overall investments beyond the originally planned amount? If yes, by how much?

The findings show that more than 21% of the businesses surveyed brought forward the timing of some of their capital investments. Almost 12% stated that they had been encouraged to increase their overall capital investment, with the increase in the value of investments amounting to around 18% following the introduction of the measure.

#### Answers to questions on the extra depreciation allowance measure

(%, weighted by staff level)

|   | Businesses that brought forward the timing of capital investments | Businesses encouraged to increase overall investments | Increase in investment following the measure |
|---|---|---|--|
| Manufacturing industry (all businesses)                     | 20.8  | 11.8  | 17.9   |
| Businesses with less than 500 employees                     | 22.4  | 15.0  | 21.2   |
| Businesses with more than 500 employees                     | 18.9  | 7.8   | 9.4  |
| Agriculture and manufacture of food products                | 17.1  | 15.3  | 18.3   |
| Electrical, electronic and computer equipment and machinery | 28.2  | 11.0  | 16.0   |
| Transport equipment   | 14.5  | 6.8   | 9.4  |
| Other manufacturing   | 21.4  | 12.7  | 19.6   |

Source: Banque de France, COT survey.



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## Appendix

### Methodological information

#### The Banque de France's COT survey

Since 1989, the Banque de France has carried out an annual survey on productive capital operating times (COT) through its branch network, targeting non-energy manufacturing firms with more than 20 employees. COT corresponds to the average number of hours equipment is used during the reference week. It forms an element of capital utilisation analysis and therefore business profitability, as COT has an impact on the depreciation cost of productive capital. It depends both on average working times and the way work is organised. This survey is particularly useful for understanding changes in conditions in the different manufacturing industry sectors. It is carried out annually in September and in 2017 was addressed to 1,310 businesses. It asked questions on:

- past and projected changes in COT;
- staff levels and working time during the current and previous year;
- the use of shift work and its organisation;
- obstacles to or breaks on extending COT;
- the capacity utilisation rate (without taking on additional employees).

**Shift work** is organised in three different ways:

- a discontinuous shift pattern, with a daily halt in production;
- a semi-continuous shift pattern, with a weekly halt in production;
- a continuous shift pattern, with no halt in production during the week, but with the possibility of a pause during the year.

The **reference week** for the businesses surveyed ran from 4 to 10 September in 2017 (and from 5 to 11 September in 2016).

A new question was added to the 2017 survey on the implementation of the measure to boost productive investment that was in effect from 15 April 2015 to 14 April 2017. The extra depreciation allowance for tax purposes was applicable for investments made until 14 April 2017.

The **sample** is made up of firms belonging to the following sectors: agriculture and manufacture of food products (Insee summary economic classification (NES) A17, "C1", corresponding to 15.7% of manufacturing output in 2015), the manufacture of electrical, electronic and computer equipment and machinery ("C3", 18.6%), the manufacture of transport equipment ("C4", 16.8%) and other manufacturing ("C5", 48.9%). The survey results are weighted using comprehensive Insee statistics on 2015 staff levels. Between 2016 and 2017, the sample's coverage ratio remained unchanged at 12.6%, after 11.4% in 2015 (see table on the following page).

**Business size** is defined on the basis of total staff employed, including temporary workers. "Small and medium-sized industries" (SMLs) have 20 to 499 employees and "large firms" (LF) have 500 employees or more.

The averages presented are obtained by weighting on the basis of businesses' staff levels.



### Sample representativeness by business size and industry sector in 2017

(level in numbers, proportion in %)

|  | Total population<br>(Insee) |            |             |            | COT survey sample<br>(Banque de France) |            |             |            | Staff<br>coverage<br>ratio |
|--|-----------------------------|------------|-------------|------------|---|------------|-------------|------------|----------------------------|
|  | Number of businesses        |            | Total staff |            | Number of businesses                    |            | Total staff |            |                            |
|  | Level                       | Proportion | Level       | Proportion | Level                                   | Proportion | Level       | Proportion |                            |
| <b>Manufacturing industry</b>                                  | 15,845                      | 100.0      | 2,127,941   | 100.0      | 1,310                                   | 100.0      | 267,069     | 100.0      | 12.6                       |
| <b>By business size</b>  |                             |            |             |            |   |            |             |            |                            |
| SMI (20 to 499 employees)                                      | 15,214                      | 96.0       | 1,169,395   | 55.0       | 1,197                                   | 91.4       | 144,721     | 54.2       | 12.4                       |
| LF (500 employees or more)                                     | 631                         | 4.0        | 958,546     | 45.0       | 113                                     | 8.6        | 122,348     | 45.8       | 12.8                       |
| <b>By industry sector</b>                                      |                             |            |             |            |   |            |             |            |                            |
| Agriculture and manufacture<br>of food products                | 2,371                       | 15.0       | 333,562     | 15.7       | 173                                     | 13.2       | 35,802      | 13.4       | 10.7                       |
| Electrical, electronic and computer<br>equipment and machinery | 2,623                       | 16.6       | 396,281     | 18.6       | 232                                     | 17.7       | 56,759      | 21.3       | 14.3                       |
| Transport equipment  | 690                         | 4.4        | 358,365     | 16.8       | 81                                      | 6.2        | 50,180      | 18.8       | 14.0                       |
| Other manufacturing  | 10,161                      | 64.1       | 1,039,733   | 48.9       | 824                                     | 62.9       | 124,328     | 46.6       | 12.0                       |

Source: Banque de France, COT survey.

Notes: SMI – small and medium-sized industries; LF – large firms.

Coverage ratios are calculated on the basis of comprehensive Insee statistics on 2015 staff levels.

Scope: Manufacturing industry, firms with 20 employees or more.

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