

EURO AREA MANUFACTURING BOTTLENECKS

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Since the end of 2020, manufacturing in the euro area and other advanced economies has been facing increasing disruption in its productive processes. In addition to upward pressure on commodity prices, the rapid recovery in global demand has led to input supply problems in industries such as semiconductors, chemical products, plastics, wood and industrial metals. These difficulties are being compounded by strains in shipping.¹ Against this background, the euro area economies, which are heavily dependent on imports of raw materials and intermediate inputs for their productive processes, face a shortage of basic components. This shortage is generating production bottlenecks, which are preventing supply from meeting the demand from orders within the required time periods.²

These mismatches are largely a result of the rapid recovery in demand and changes in consumption patterns. Consumption is being driven by the gradual easing of the restrictions imposed to contain the spread of the COVID-19 pandemic, vaccination progress and the reopening of the services sector. Also, the demand for some manufactured products has strengthened enormously during the pandemic. Thus, for example, the greater need for digitalisation in the workplace, education and the home boosted purchases of electronic devices, while reduced mobility and the fall in spending on certain services – primarily as a result of the pandemic containment measures – prompted a shift in private consumption towards purchases of goods, especially durable household equipment.

As seen in Chart 1, these bottlenecks are reflected in PMI indicators of suppliers' delivery times, which have experienced an increase that is unprecedented in the euro area and in European Commission surveys. According to this latter source, the percentage of euro area manufacturing firms facing material and/or equipment shortages reached an all-time high in July, of almost 40%, well above the 7% level recorded at the end of 2020 and

the levels of recent years. On the evidence available, these restrictions mainly relate to supply difficulties along the value chain rather than to capacity limits. Thus, although capacity utilisation in manufacturing has recovered rapidly in recent months and exceeds its historical average across a broad swathe of industries, it is still within the normal range observed in the past (see Chart 2). In any case, as a consequence of these developments, stocks of finished products in the euro area have also declined to historically very low levels in recent months (see Chart 3).

By country, bottlenecks have affected the German economy especially severely (see Chart 4). In particular, in July, 70% of German manufacturing firms was constrained by material and/or equipment shortages, well above the 42% level observed in April and the normal historical range for this variable. And this was against a background in which only 12% of German firms reported a lack of demand in July. In the other major euro area economies, although the shortage of material and/or equipment is not proving to be the key limiting factor for firms, its importance is increasing and the percentage of firms affected by this factor stands significantly above its historical average.³ Thus, for example, in Spain, 22% of surveyed firms reported supply restrictions associated with material and/or equipment shortages in July (as against 13% in April), while 37% considered lack of demand to be a factor limiting their production.

These developments arise against a backdrop of strengthening demand. As shown in Chart 4 (right-hand side), the percentage of firms affected by insufficient demand has dropped substantially in recent months, across countries, to stand at the lower end of available historical data.

Among the manufacturing industries with the greatest economic weight, bottlenecks have emerged earlier and have had a stronger impact in the car industry, the

1 See Box 1, "What is driving the recent surge in shipping costs?", *Economic Bulletin*, 3/2021, European Central Bank, and Box 6, "The semiconductor shortage and its implication for euro area trade, production and prices", *Economic Bulletin*, 4/2021, European Central Bank.

2 For the United States, see, for example, P. Krolkowski and K. Naggert (2021), *Semiconductor Shortages and Vehicle Production and Prices*, Economic Commentary, Federal Reserve Bank of Cleveland, vol 2021(17).

3 In the case of France, the information supplied by the European Commission does not appear to be comparable with that for other countries and does not reflect the material shortage problem in French manufacturing that is detected by other sources of information. The European Commission data for France may refer mainly to the "lack of equipment" as a factor limiting production, since the national questionnaire has two separate options, "shortage of equipment or material" and "supply difficulties". Also, according to the INSEE, and in line with the other major economies, the percentage of firms with "supply difficulties" stood at almost 37% in July, as compared with 26% in April, the 95th percentile of the historic time series being 20%; in line with the findings of the Banque de France's June survey findings (*Update on business conditions in France at the start of July 2021*).

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manufacture of electrical equipment, computer and electronic products, rubber and plastic products, as well as in the chemical industry. These supply constraints have been passed through to the rest of the economy, particularly in Germany. In this connection, the heat map

shown in Table 1 shows the industries hardest hit by these bottlenecks, i.e. those in which the percentage of firms facing material and/or equipment shortages exceeds a specific country threshold. This threshold is determined by taking the historical average value of this percentage

Chart 1
PRODUCTION BOTTLENECKS. EURO AREA MANUFACTURING

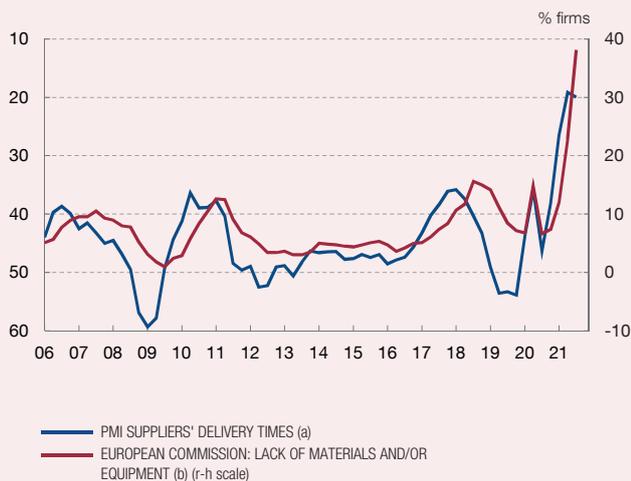


Chart 2
PRODUCTION CAPACITY UTILISATION
EUROPEAN COMMISSION'S QUARTERLY BUSINESS SURVEY

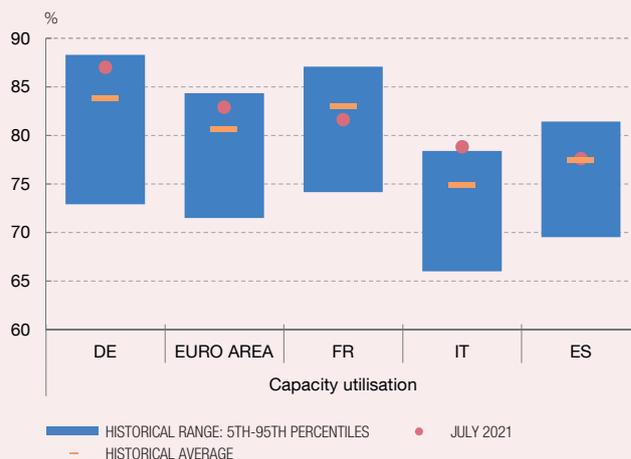
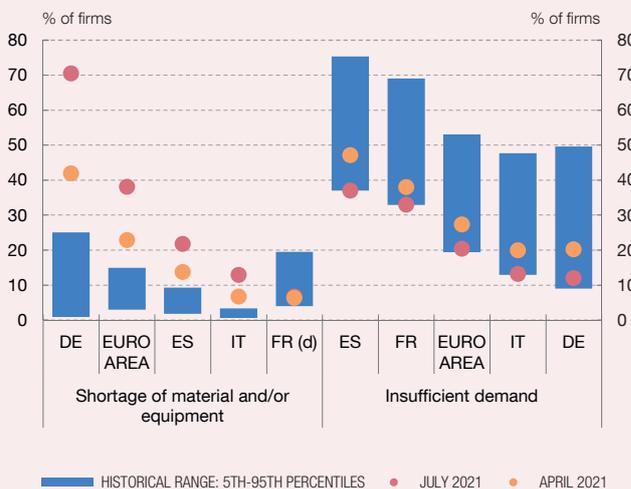


Chart 3
STOCK OF FINISHED PRODUCTS. EURO AREA MANUFACTURING
EUROPEAN COMMISSION'S MONTHLY BUSINESS SURVEY



Chart 4
FACTORS LIMITING MANUFACTURING PRODUCTION
EUROPEAN COMMISSION'S QUARTERLY BUSINESS SURVEY



SOURCES: European Commission, Markit and Banco de España.

- a Inverted left-hand scale. An increase denotes a delay in suppliers' material delivery times.
- b Shows the percentage of firms reporting a "shortage of material and/or equipment" as a key limiting factor for their production.
- c Measured as a net percentage, i.e. the difference between "excessive" and "insufficient" responses to the question on the level of the stock of finished products, as a percentage of all responses.
- d In the case of France, the European Commission data do not reflect the problem of a shortage of material which also exists in French manufacturing and is detected by other sources of information. See footnote 3.

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for the country's economy as a whole plus three standard deviations. According to this criterion, in July, the hardest hit sectors accounted for nearly 80% of euro area manufacturing GVA, compared with 50% in April. By

country, the sectors with the greatest constraints in July had a weight in total manufacturing GVA of around 90% in Germany, 75% in Italy and 45% in Spain, compared with 60%, 55% and 30% in April, respectively.

Table 1
INDUSTRIES AFFECTED BY A SHORTAGE OF MATERIAL AND/OR EQUIPMENT (a)

Manufacturing industries	Euro area		Germany		Italy		Spain	
	Share	% firms affected	Share	% firms affected	Share	% firms affected	Share	% firms affected
29 Motor vehicles	11.3 %	60	20.5 %	88	5.7 %	10	9.2 %	43
27 Electrical equipment	4.8 %	56	6.7 %	82	4.2 %	25	3.6 %	48
26 Computer and electronic products	5.4 %	49	6.4 %	88	3.3 %	21	1.3 %	33
22 Rubber and plastic products	4.4 %	47	4.5 %	91	5.1 %	21	4.8 %	53
28 Machinery and equipment	12.8 %	47	15.7 %	71	14.5 %	23		
16 Wood and cork	1.6 %	39	1.0 %	58	1.8 %	27	1.5 %	35
33 Repair of equipment	4.3 %	38			3.7 %	7		
20 Chemicals and chemical products	8.2 %	38	6.9 %	71	4.8 %	19	6.7 %	19
25 Metal products, except machinery and equipment	8.9 %	37	8.6 %	75	12.7 %	15	9.1 %	39
31 Furniture	1.6 %	36	1.2 %	83	2.9 %	17		
19 Coke and refined petroleum products	1.1 %	33	0.7 %	100				
17 Paper	2.2 %	32	1.7 %	68	2.2 %	13		
24 Basic metals	3.5 %	25	3.4 %	42	3.6 %	12	4.9 %	17
30 Other transport equipment	2.9 %	24			3.0 %	16		
32 Other manufacturing	2.4 %	23			2.6 %	8		
23 Other non-metallic mineral products	3.3 %	23	2.7 %	51	3.9 %	10	4.4 %	18
13 Textiles			0.7 %	64				
10 Food			5.7 %	41				
21 Pharmaceuticals								
18 Printing			1.0 %	48				
14 Wearing apparel			0.4 %	40				
15 Leather and related products			0.1 %	56				
11 Beverages								
Total manufacturing		38		71		13		22
Memorandum item								
Share of constrained industries (% of GVA)								
July 2021 survey		79		88		74		46
April 2021 survey		50		59		54		32

SOURCES: European Commission and Banco de España

a Figures are only shown for industries suffering significant constraints associated with a shortage of material and/or equipment. Such industries are considered to be those in which the percentage of firms indicating problems of shortage of material and/or equipment in the July 2021 survey is above the historic mean plus three standard deviations for the country as a whole. According to this criterion, the threshold is 22% for the euro area, 38% for Germany, 6% for Italy and 14% for Spain. The colour shade depends on the distance of the value from the historic mean. The share of the industry refers to its share in manufacturing GVA between 2017 and 2019, depending on data availability. France is omitted because, as indicated previously, there are doubts regarding the comparability of its data.

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Naturally, the constraints by country and industry shown in Table 1 reflect, to some degree, the considerable propagation of supply and demand mismatches across industries and countries observed in recent months. To

illustrate the importance of this propagation channel, Chart 5 shows, using input-output tables, the value added generated in constrained sectors in Germany that is incorporated into manufacturing output in Spain and

Chart 5
DEPENDENCE IN DIFFERENT COUNTRIES ON MANUFACTURING AFFECTED BY A SHORTAGE OF MATERIAL AND/OR EQUIPMENT IN GERMANY (a). (TIVA 2015)

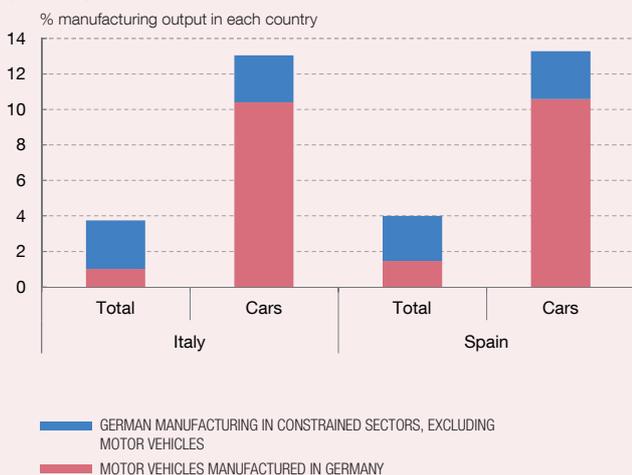


Chart 6
MANUFACTURING OUTPUT GROWTH (b)
Quarter-on-quarter rate and contribution by sector

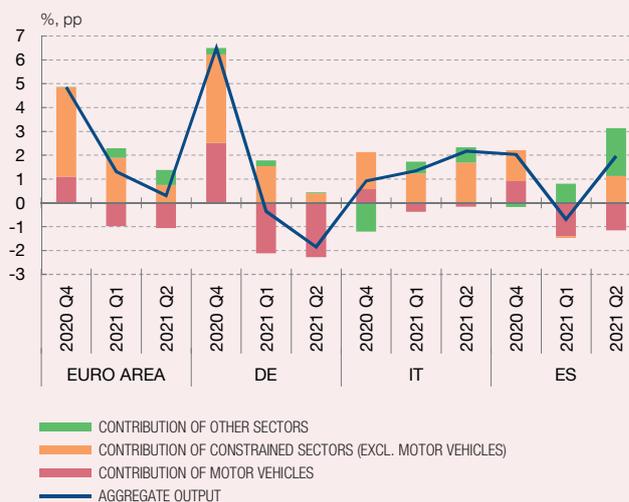


Chart 7
QUALITATIVE PRICE INDICATORS. EURO AREA MANUFACTURING

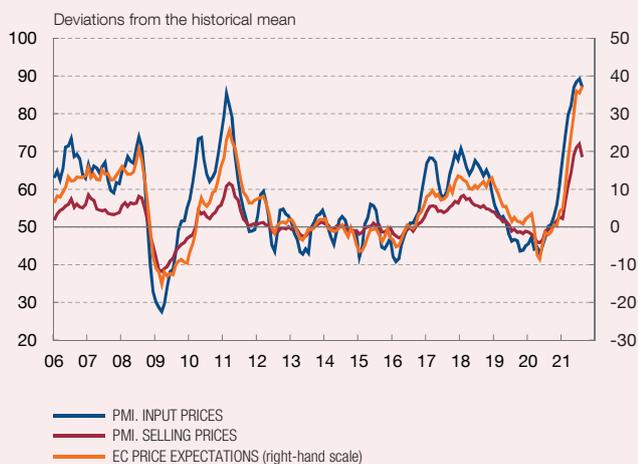
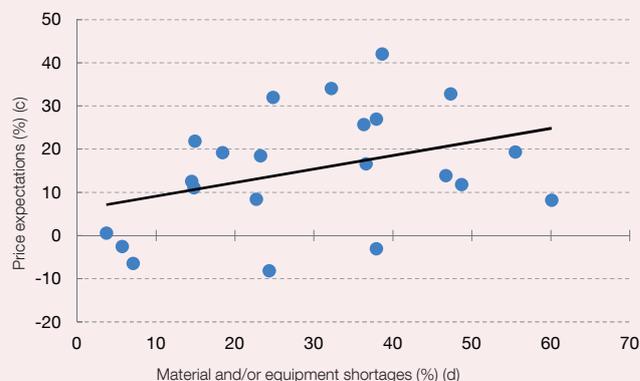


Chart 8
MATERIAL AND/OR EQUIPMENT SHORTAGES AND PRICE EXPECTATIONS. EURO AREA. EC JULY SURVEY



SOURCES: European Commission (EC), Eurostat, Markit, OECD and Banco de España.

- a Dependence is measured as value added generated in Germany that is incorporated into the final demand of the countries in question. The blue bars show value added from the German car industry incorporated into total manufacturing and car output of other countries, while the red bars show value added from other constrained German manufacturing incorporated into the same aggregates.
- b Aggregate production is obtained as the weighted sum of the Industrial Production Index (IPI) for each sector using their weight in the euro area IPI. For countries, the weight in gross added value (GVA) is used. The sectors considered to be constrained are shown in Table 1 and are those in which the percentage of firms facing material and/or equipment shortages exceed a specific country threshold.
- c Expectations as to changes in selling prices in the next three months, expressed as a net percentage, i.e. the number of firms indicating an "increase" minus those indicating a "decrease" as a proportion of the total number of replies.
- d Percentage of firms indicating material and/or equipment shortages as a factor limiting production.

Italy. This dependence is particularly high in the car industry.⁴

On this evidence, the manufacturing bottlenecks observed since end-2020 may have contributed significantly to the slowdown in industrial production in the euro area in 2021 H1. Indeed, as Chart 6 shows, the slowdown in production in the industries considered constrained, particularly the car industry, has been very marked in the euro area. In line with the evidence presented above, these developments have been particularly strong in Germany.

In a setting of rapidly growing demand and rising commodity and transport prices, supply difficulties have led to significant increases in producer prices, although these have been highly uneven across industries. According to the firms themselves, protracted or rising inflationary pressures in the future cannot be ruled out. Thus, for example, both the qualitative PMI selling price indicators and future price expectations in the European

Commission's survey have reached historically high levels (see Chart 7). Moreover, the correlation between these expectations and the degree of the material and/or equipment shortages is positive, suggesting that price increase expectations in the euro area are higher in industries that are subject to greater constraints (see Chart 8).

In short, this box shows how material and/or equipment shortages are preventing euro area manufacturing firms from fully responding to the rapid recovery in demand, which could hinder the economic recovery process. This effect may be compounded if the bottlenecks affect other productive sectors, particularly the more manufacturing-oriented services sectors, such as transport, wholesale trade and some professional services.⁵ These problems are likely to be essentially temporary and to gradually fade as demand recovers and supply adjusts. However, their persistence could lead to mounting upward pressures on prices.

4 Production in the European car industry is highly fragmented. For more details about the production chain in this industry, see Box 5, "The impact of the car industry slowdown from a global value chain perspective", Quarterly Report on the Spanish Economy, *Economic Bulletin*, 2/2019, Banco de España. For an analysis focused on the European car industry, see M. Izquierdo, E. Moral, E. Prades and J. Quintana (2021), "The propagation of worldwide sector-specific shocks", Working Paper (forthcoming), Banco de España.

5 For Spain, see Box 8, "The recent slowdown in activity from a sectoral perspective", Quarterly Report on the Spanish Economy, *Economic Bulletin*, 4/2019, Banco de España.