

Impact of supply constraints on the Dutch economy from an international perspective

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Key points

- Since the world economy started recovering at the end of 2020, companies have increasingly faced production constraints due to demand outstripping supply. A European Commission survey from October 2021 showed that 35% of Dutch manufacturers, weighted by company size, indicated that shortages of materials prevent them from meeting demand. This percentage increases to above 70% in specific sectors, such as the automotive sector, mainly due to semiconductor shortages.
- Businesses also report staff shortages, in addition to material shortages. In the Dutch services sectors in particular, a large percentage of companies report constraints caused by labour shortages. However, while substantially higher than in other euro area countries, Dutch labour shortages were already at a high level prior to the pandemic. Increased flexibility is expected to absorb labour shortages in the services sector, in contrast to material shortages in the manufacturing sector, as every component can be vital for the end product.
- A back-of-the-envelope calculation shows that almost all sub-sectors of the Dutch manufacturing sector and construction sector are significantly affected by material shortages. The output affected, however, represents only a small proportion of the Dutch economy, accounting for some 5.2% of Dutch GDP. In the euro area this proportion averages 9.8%, and in Germany it is 19.4% on average. Incidentally, the machinery sector, which is important for the Netherlands, benefits from material shortages, owing to the sharp increase in demand for semiconductor production equipment.
- The ultimate impact of the recent supply constraints on the Dutch economy will strongly depend on how long constraints persist. Given the multifaceted and complex nature of the supply constraints, it remains difficult to predict when supply and demand will return to a more balanced state. The normalisation of global demand and the resulting consumption shift from goods back to services will play an important role in this.

1. Introduction

Since the start of the global recovery at the end of 2021, businesses have increasingly faced production constraints. Dutch companies are no exception. In October 2021, 35% of Dutch companies in the manufacturing sector, weighted by business size, indicated that their production was hampered by a shortage of materials.¹ At the end of 2020 this figure stood at a mere 8%. The rapid recovery in global demand for goods has created substantial shortages of raw materials and shipping containers. Ongoing congestion in international ports and factories due to new COVID-19 infections, low initial business inventories and shifts in consumption patterns also play a role. As a result, delivery times for end products and intermediate goods have risen sharply worldwide (see Figure 1). The difference between the number of orders that companies receive and the output they realise is also at historically high levels (see Figure 2). In addition, the number of vacancies in the Netherlands is at record level, and many Dutch companies say their production is hampered by staff shortages. Based on recent European Commission survey data², this analysis shows at a sub-sector level how exceptional these shortages are, how they compare with other euro area countries and how vulnerable the Dutch economy is to these supply constraints.

Figure 1. Delivery times have risen significantly

Equilibrium=50, PMI suppliers' delivery times

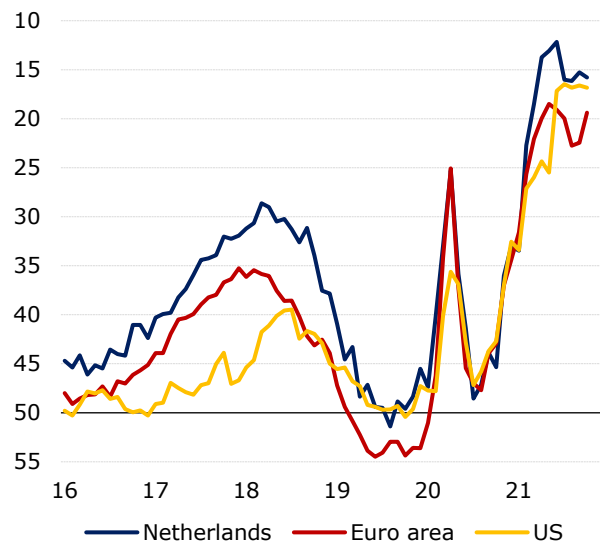
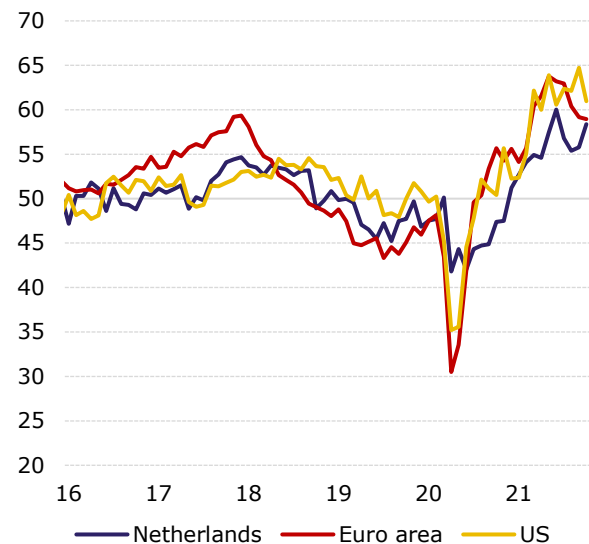


Figure 2. The difference between orders and output is high

Equilibrium=50, PMI backlogs of work



Source: IHS Markit.

¹ The percentages of companies given below are all from the European Commission, weighted by business size (e.g. turnover or headcount). Further details on the European Commission's weighting method can be found [here](#).

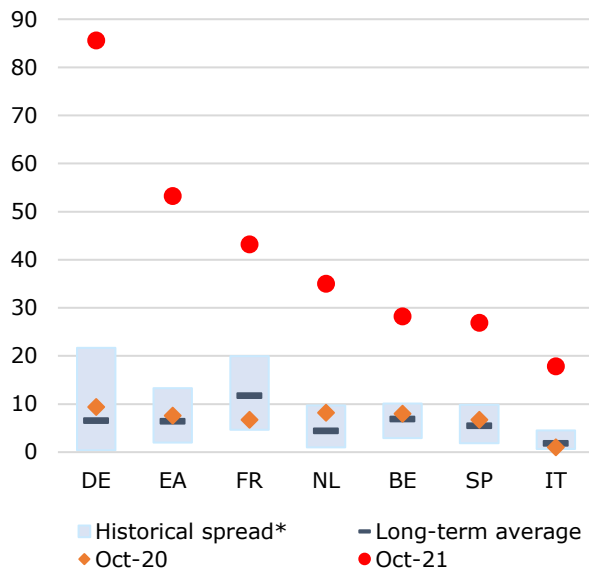
² In the [European Commission survey](#) companies indicate whether their production processes are currently being constrained and, if so, by which factors. Companies can indicate whether they are constrained by: (i) insufficient demand, (ii) material/space shortages, (iii) staff shortages, (iv) financial problems, (v) weather conditions, and (iv) other causes.

2. Material shortages in the manufacturing sector have risen substantially

The proportion of Dutch industrial companies that experienced production constraints due to material shortages in October 2021 increased sharply in the Netherlands compared with pre-COVID-19 data. In October, more than one-third of companies in the Dutch manufacturing sector said they experienced production constraints due to material shortages, well above the 4.4% long-term average (1995-2020) and the 8.0% when the economic recovery started in the fourth quarter of 2020 (see Figure 3). At the same time, the proportion of companies that experienced insufficient demand as a production constraint fell sharply, from one-third at the end of 2020 to 11% in October 2021. Although the manufacturing sector's capacity utilisation rate has risen slightly, it has not yet reached its limit (Figure 4).^{3 4} This shows that current industrial production impediments are mainly related to supply problems within the production chain. In the euro area as a whole, more than half of industrial companies said material shortages were hampering production, with the German manufacturing sector suffering the most by far (see Figure 3). In the Dutch construction sector, material shortages are also a limiting factor for companies. In October, more than 24% of companies in the construction sector were affected.

Figure 3. Material shortages in the manufacturing sector

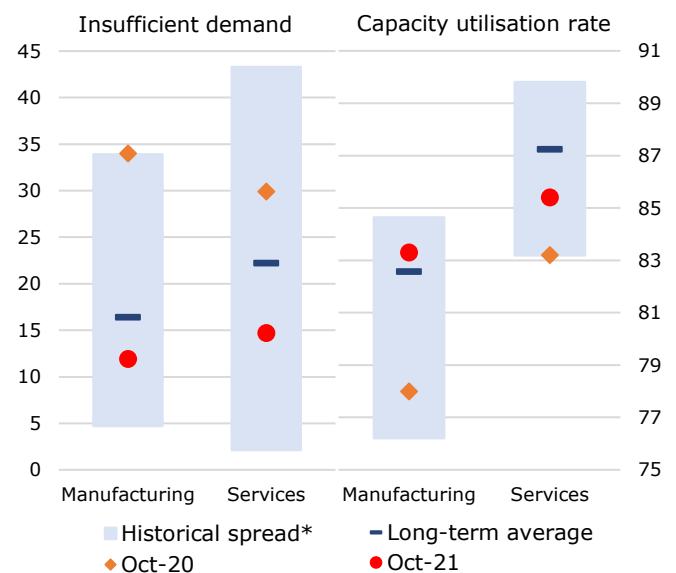
Percentage of companies



Source: Industrial businesses survey, European Commission.
*5th-95th percentile.

Figure 4. Insufficient demand and capacity utilisation rates in Dutch manufacturing

Percentage of companies (left axis) and percentages (right axis)



³ The capacity utilization rate is the actual output as a percentage of a company's available production capacity.
⁴ Even if we focus on the various sub-sectors, in October no sub-sector has reached its capacity utilization limit.

3. Affected sectors have relatively small shares in the Dutch economy

In Table 1 on page 7, columns b and c show, for each sub-sector of the manufacturing and construction sectors, the percentages of companies affected by material and staff shortages. In some sub-sectors, the percentage of companies experiencing shortages does not differ significantly from its historical average. These are therefore not considered exceptional. Based on a sector-specific threshold, we have determined which sub-sectors do show exceptional percentages.⁵ This is the historical average value of the percentage of companies facing constraints across the sector plus three standard deviations.⁶ If the percentage of these companies within a sub-sector is higher or equal to this threshold value, we consider this sub-sector to be significantly hard hit. These percentages are highlighted in red in Table 1 and are considered hard hit by current material and labour shortages. The deeper the red colour, the wider the gap between the percentage and the calculated threshold value. Table 1 shows that 21 of 24 sub-sectors in the Dutch manufacturing sector are significantly affected by material shortages. The most severely affected sub-sectors for the Netherlands are the manufacture of (i) motor vehicles and trailers, (ii) electric equipment, (iii) basic metals, (iv) machinery, and (v) beverages. The situation is partly the same for the euro area. In addition to the manufacture of motor vehicles and trailers, electric equipment, and machinery, the manufacture of electronic products and rubber and plastic products are among the hardest hit sub-sectors. The motor vehicles and trailers sector, which has a significant share in the euro area's total industrial production, has been the hardest hit by shortages of materials, notably semiconductors. In the Netherlands, the share of the motor vehicles and trailers sector in the total added value of the manufacturing sector is relatively limited, whereas it is relatively large in Germany. In addition, Table 1 shows that a large proportion of the German sub-sectors are relatively hard hit, as reflected by the deeper red colour of the cells for Germany.

To assess the impact of these shortages on the Dutch economy, we multiplied, for all sub-sectors that are significantly affected, the percentage of constrained firms (red cells in column b) by the share of these sub-sectors in the Dutch manufacturing sector (column a). This provides an indication of the proportion of total output that is hit hard. It shows that one-third of Dutch industrial output is severely affected by material shortages. For the construction sector, we have done the same exercise, demonstrating that a quarter of total output is being hit hard. Together, this represents 5.2% of total Dutch GDP.⁷ For Germany, this is no less than 19.4% of GDP, and for the euro area it is 9.8%. From this, it can be concluded that production constrained by material shortages has a relatively small share in the Dutch economy, which means that the immediate macroeconomic impact is relatively limited for the Netherlands.

⁵ Banco de España (2021) has used the same type of method in its analysis of the impact of supply constraints on the Spanish economy.

⁶ This threshold value is calculated separately for each country/sector combination and for each type of impediment. For the Dutch manufacturing and construction sectors, these are 12.4% and 14.7%, and 24.2% and 32.0%, respectively, for the materials and staff shortages.

⁷ Because the fraction of companies is weighted by the European Commission according to company size, we could multiply it by the share of the respective sub-sector in the economy. We then multiplied the outcome by the share of the entire sector in the Dutch economy (12.3% for manufacturing sector and 4.7% for the construction sector) to arrive at a percentage of GDP.

Table 1 Hardest hit sub-sectors in October 2021

(a) = share in total sector, (b) = % of companies constrained by material shortages, (c) = % of companies constrained by staff shortages, (d) share of significantly constrained production

	Euro area			Netherlands			Germany		
Manufacturing sector	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Motor vehicles and trailers	11.3	87	23	3.4	72	43	20.4	100	36
Electric equipment	4.8	81	27	3.6	67	40	6.7	100	39
Electronic products	5.4	75	29	5.1	27	15	6.4	100	47
Rubber and plastic products	4.4	75	21	3.6	40	31	4.5	100	34
Machinery	12.8	65	26	14.4	51	43	15.8	93	34
Other transport equipment	2.9	57	1	1.7	27	27	2.3	n/a	n/a
Metal products	8.9	52	28	8.8	36	41	8.6	83	45
Chemicals	8.2	51	12	13.4	30	23	6.9	75	18
Paper	2.2	51	20	2.3	35	33	1.7	87	38
Printing and reproduction	1.3	51	20	1.6	35	33	1.0	87	38
Repair and installation of machinery	4.3	51	31	4.3	18	39	2.4	n/a	n/a
Furniture	1.6	47	25	1.7	35	39	1.2	79	40
Pharmaceuticals	4.8	37	7	3.2	15	14	3.8	53	9
Wood products	1.6	37	25	1.3	31	23	1.0	52	45
Coke and petroleum	1.1	36	3	1.7	11	16	0.7	100	1
Other products	2.4	35	14	4.5	8	20	2.4	48	32
Textiles	1.3	34	22	0.5	27	35	0.6	74	51
Basic metals	3.5	30	20	2.6	60	24	3.4	55	37
Building materials	3.3	28	18	2.5	21	44	2.7	46	32
Beverages	1.9	27	10	1.8	46	50	0.9	36	13
Food products	9.5	27	22	14.1	18	30	5.7	60	34
Wearing apparel	1.1	12	6	0.5	9	3	0.4	63	10
Leather and footwear	0.9	8	13	0.4	35	29	0.1	63	44
Tobacco products	-	n/a	n/a	3.2	24	0	-	n/a	n/a
Construction sector									
Specialised construction activities	33	17	33	52	24	36	-	-	-
Construction of buildings	33	17	19	34	24	26	50	40	31
Civil engineering	33	13	25	14	34	11	50	27	34
		(d)			(d)			(d)	
Manufacturing sector		53			33			80	
Construction sector		16			25			34	
Total in terms of GDP (%)		9.8			5.2			19.4	

Source: European Commission and own calculations.

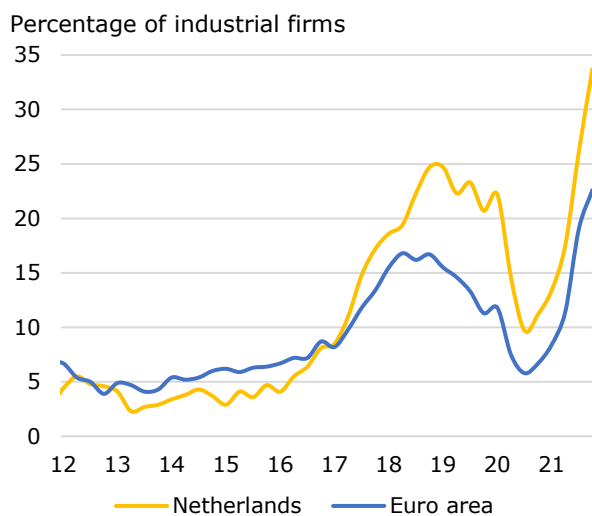
Notes: The table shows the percentages of businesses weighted by business size whose production was constrained by material and/or staff shortages in October 2021. The cells marked in red show percentages that differ significantly from their historical averages. This is determined by reference to sector-specific threshold values for each country-sector and type of impediment. This is the historical average value of the percentage of constrained companies across the sector plus three standard deviations. For example, for Dutch manufacturing sector, it is 12.4% for material shortages and 24.2% for labour shortages. The deeper the red colour, the greater the distance between the percentage and the calculated threshold value and, hence, the harder the sub-sector is hit. For the euro area and Germany, no share figures are available for the construction sub-sectors. For this purpose, the sub-sectors are assumed to have equal shares in the sector. In some German sectors, the percentage of companies experiencing material shortages exceeded 100% due to seasonal data adjustments. These percentages have been truncated to 100%.

In addition to material shortages, production in the Dutch manufacturing sector is also constrained by staff shortages, but these shortages were already substantial before the COVID-19 crisis. Almost 34% of Dutch companies in manufacturing sector consider staff shortages to be a production constraint. This figure far exceeds the long-term average of 6.4%. In the years prior to the COVID-19 crisis, companies already faced substantial staff shortages. In 2018 and 2019, 22% of Dutch companies did (see Figure 5). The labour force shortage is therefore partly a structural issue. Zooming in on the sub-sectors (see Table 1), two-thirds are currently facing exceptionally high staff shortages.

4. Dutch manufacturing sector also benefits from material shortages

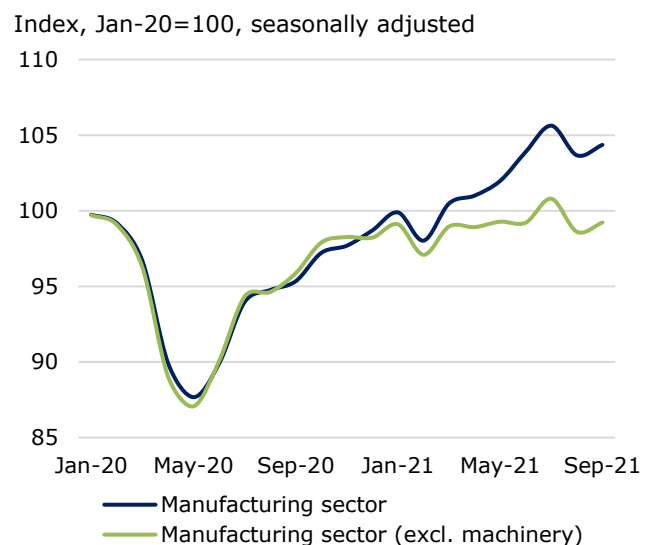
The extent to which Dutch manufacturing output has actually dropped due to shortages is difficult to establish. Despite the gradual increase in material and staff shortages for most sub-sectors since the end of 2020, industrial output increased sharply in the first nine months of 2021. This does not mean that the shortages did not affect industrial output figures at all. In addition, there are large underlying differences between sub-sectors. For example, production in the Dutch motor vehicles and trailers sector contracted sharply (-25% in September compared with January 2021), in line with the material shortages reported. By contrast, production in the machinery sector increased sharply (+37% in September compared with January), while this sub-sector also faces substantial shortages. This increase reflects the surge in demand for semiconductor production equipment due to the global shortage of semiconductors. Accordingly, the Netherlands also benefits from material shortages thanks to the strong position of the Dutch semiconductor production sector.⁸ In addition, the machinery sector's share of the total Dutch manufacturing sector is relatively large at 14.4%. Without the machinery sector, the level of industrial output in September 2021 would have been equal to that seen in January 2021 (see Figure 6).

Figure 5. Production impediments due to labour shortages



Source: Industrial businesses survey, European Commission.

Figure 6. Importance of machinery sector for Dutch manufacturing sector

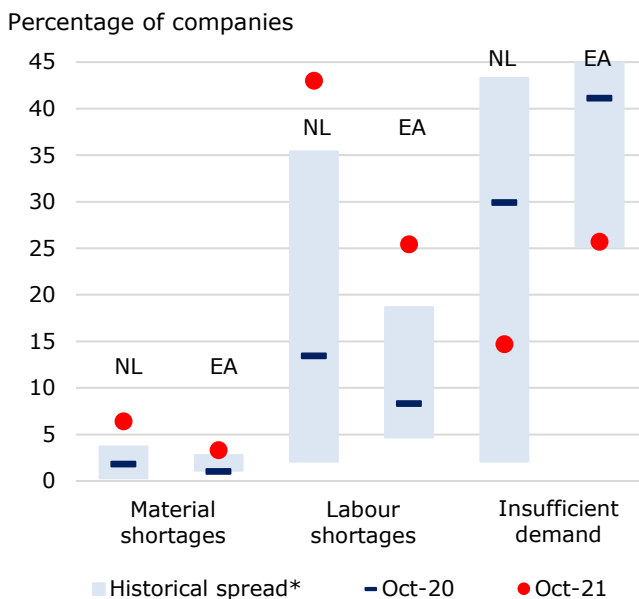


⁸ Demand for ASML's sophisticated semiconductor production equipment has risen sharply due to semiconductor shortages. ASML expects a 35% surge in sales in 2021 (Het Financieele Dagblad, 2021).

5. Services sector is mainly affected by structural staff shortages

In the services sector, staff shortages are a notable production constraint. In October, 43% of the companies reported production constraints due to staff shortages, whereas only 6.4% considered shortages of space or materials to be hampering activities. At the same time, the percentage of companies perceiving insufficient demand as an impediment declined substantially, in line with the reopening of the economy. Labour shortages are relatively high in the Dutch services sector; in the euro area as a whole, this figure stood at 25% (see Figure 7). However, the high labour shortages are characteristic of the Netherlands. In 2018 and 2019, when the Dutch labour market was relatively tight, an average of 33% of service sector companies experienced staff shortages. This means staff shortages are largely a structural issue, temporarily exacerbated by COVID-19 related factors, such as a decline in the labour participation rate among young people, a fall in immigration and a shift in employment from the private sector to the public sector. Since the pandemic, employment in the public sector has increased substantially due to contamination testing, source and contact tracing, and vaccinations.

Figure 7. Production constraints in the Dutch and euro area services sectors



* 5th-95th percentile.

Source: Service providers survey, European Commission.

6. Conclusion: impact on Dutch economy is currently relatively limited

Despite the fact that a large number of Dutch companies are being hit hard by supply shortages stemming from the transition to the post-COVID-19 economy, we consider the immediate impact on Dutch GDP to be currently relatively limited based on the above analysis. In particular, the manufacturing sector is affected by material shortages, although this is in some part offset by the fact that the Dutch machinery sector benefits from global semiconductor shortages. Given the relatively small share of constrained production in the Dutch economy, the immediate macroeconomic impact of material shortages which Dutch companies

face is limited when compared with Germany, for example. In the services sector, material/space shortages are virtually non-existent, while the relatively high labour shortages largely reflect structural issues already seen before the COVID-19 crisis. Furthermore, increased flexibility is expected to go a long way to absorbing labour shortages in the services sector, in contrast to material shortages in the manufacturing sector, as for the latter every production component can be vital for the end product. This does not mean, however, that structural labour shortages do not affect the Dutch economy, as they can inhibit (potential) growth in the long run.

The ultimate impact of the recent supply constraints on the Dutch economy will strongly depend on how long the constraints persist. The supply constraints faced by companies stem from the transition to a post-COVID-19 economy and thus reflect a temporary phenomenon. Given the multifaceted and complex nature of the supply constraints, as well as uncertainty about the duration of the pandemic, it remains difficult to predict when they will ease, allowing supply and demand to return to a more balanced state. The normalisation of global demand and the resulting consumption shift from goods back to services will play an important role in this. Once service sectors open up further and consumers return to purchasing more services, demand-side pressure on consumer goods will decrease. Addressing supply shortages of certain intermediate goods, such as semiconductors in the automotive sector, requires more patience, given the long lead time required to upscale production capacity. The same applies to the shortage of shipping containers, albeit to a lesser extent.

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