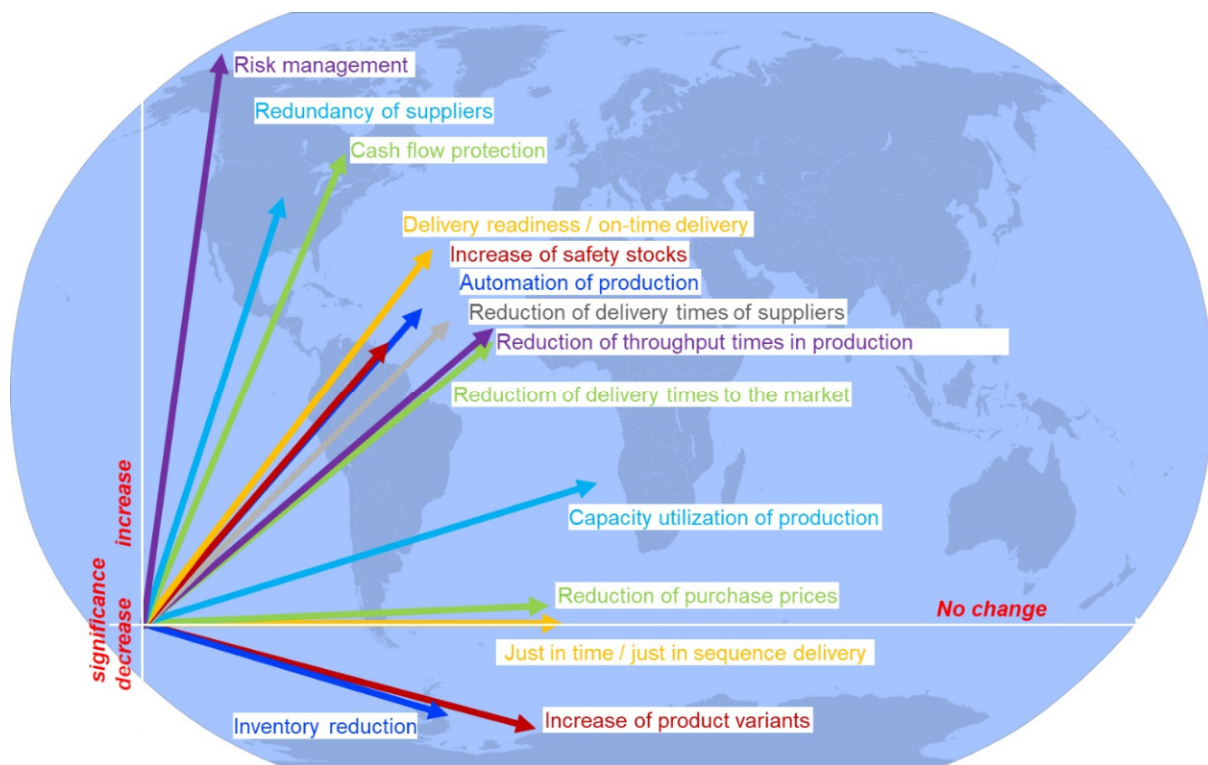


# The new standards in supply chain management after Corona

## survey findings

Challenges on the way out of the crisis

Long-term changes in the supply chain world

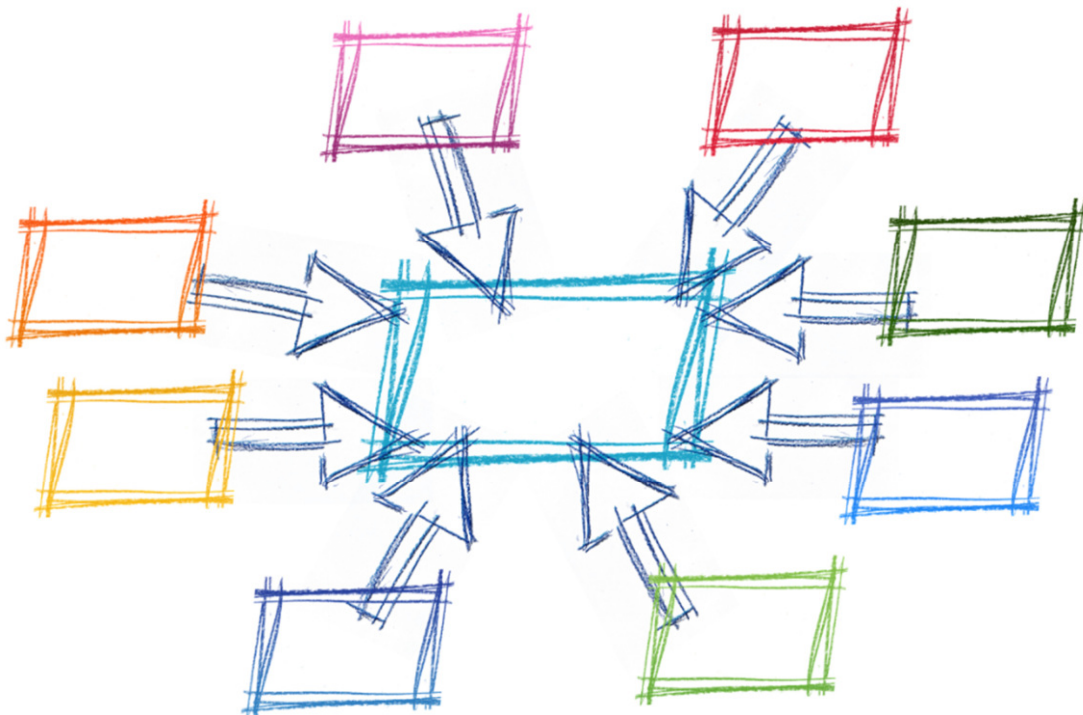


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## Preliminary remark

On April 15, 16 and 17, 2020, the Arbeitsgemeinschaft für wirtschaftliche Fertigung together with the supply chain management consultancy Abels & Kemmner conducted three online workshops with representatives of 23 member companies. In these workshops, expectations and hypotheses for the development of supply chain management and operations on the way out of and after the corona crisis were collected.

Based on these three workshops, Abels & Kemmner prepared a survey and conducted it from April 20 to April 24, 2020, in order to obtain the broadest possible opinion on the expectations and hypotheses that had been set up. The survey was aimed at people from manufacturing and trading companies working in the fields of production, logistics, supply chain management, purchasing and work preparation, as well as a smaller number of consultants dealing with logistics, supply chain management and lean management. 250 people took part in the survey. All questions had to be answered, no questions could be skipped. The results of these surveys are presented and interpreted below. The percentage values shown in the following graphs have been rounded to whole percentages. These roundings result in partially positive or negative deviations to 100%.

The survey is divided into two sections. The first section looks into the near future. It asked about the biggest challenges in ramping up production and supply chain in the coming weeks. The second section asks what the supply chain world will look like after the corona crisis. What long-term changes in supply chain management will result from the corona crisis in the opinion of the respondents?



## A look into the near future:

### The biggest challenges in ramping up production and supply chain in the coming weeks

The questions about the biggest challenges in ramping up production and supply chain in the coming weeks were divided into three topics:

- Market demand and material supply
- Staff productivity
- Economic efficiency

#### Market demand and material supply

It has already become apparent that the worldwide restrictions on movement and production shutdowns have led to difficulties in the supply of materials and to reduced market demand in many sectors and for many companies. In the coming weeks, the lock downs will be reversed in many countries, not only in Europe, either because the infection rates have fallen accordingly or because the economic situation is becoming too difficult and unemployment too high. So, will the current difficulties on the supply and demand side be resolved in the coming weeks? The opinion of the survey participants is shown in Fig. 1

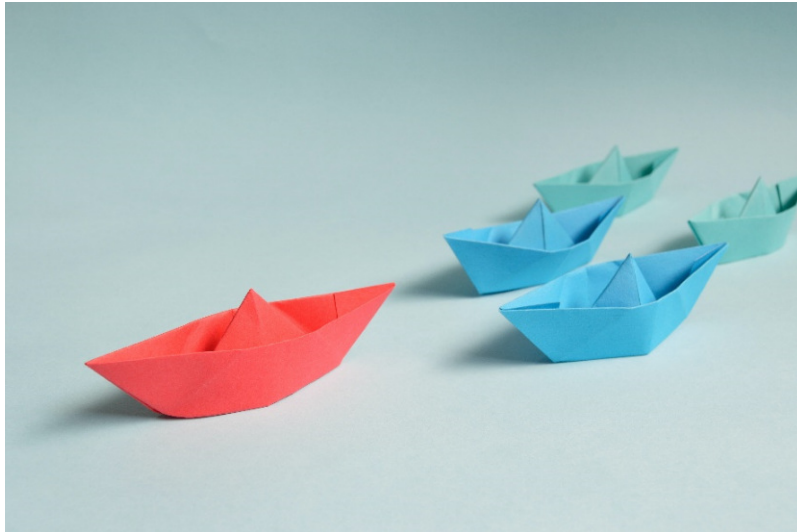
It is clear that the vast majority of respondents expect demand to remain volatile and uncertain over the next few weeks, and that the pace of the ramp-up and the easing regulations in different procurement and sales markets will vary in terms of content and timing.

When asked about the safety and reliability of the material supply in the coming weeks, the participants' views are already more differentiated. Although 77% of those surveyed assume that there will probably be difficulties with material supply, only just under a third of the experts are convinced of this, while half of them are not quite so sure. At least a good fifth of the participants assumes that problems with the supply of materials in the coming weeks are unlikely. Only 2% of the participants are convinced that no material supply problems will occur.

If one expects problems with the supply of materials during the way out of the lock-down, it is obvious that companies with a still running production will use up their stocks and therefore have to expect procurement problems with raw materials, purchased parts and packaging material. 81% of those surveyed also believe that this will happen clearly or quite clearly. As with the question concerning the general supply of materials, there is also a clear minority who expects no (17%) or probably no (2%) procurement problems.

A rather heterogeneous picture emerges regarding the question whether companies will temporarily reduce inventory in the coming weeks in order to bring down the capital tied up. As a result, the challenge would be to increase inventories again quickly enough when demand is expected to rise again. In this regard, only a narrow majority of respondents (55%) is certain or fairly certain that this is the case. While 46% of those surveyed do not or rather not expect this effect.





When the question concerning the increase in inventories is compared to further statements of the surveyed experts on future inventory management, it can be assumed that a reduction in inventories below the normal level for reasons of liquidity conservation will be no relevant for most companies on their way out of the crisis. The inventory's buffer function between fluctuations in demand and fluctuations in supply is likely to be their main focus.

However, many companies will reduce excess inventories that arose from the situation at the beginning of the corona crisis. When demand was still running, supply problems had to be resolved. Many companies have succeeded in doing this with great commitment. After the lock-down caused demand to fall, they were confronted with an avalanche of supply already in stock or on its way.

A heterogeneous picture also emerges regarding the question whether the insolvency of some suppliers will cause supply problems. 22% of those surveyed are certain of this and 42% are relatively certain, whereas 31% of the experts are rather certain and 5% are certain that it will not happen.

This heterogeneous statement is comprehensible against the background of clearly different demand situations in different industries. The economic situation in the automotive and automotive supplier industry with worldwide shutdown of production is different from, for example, that of DIY store suppliers, whose customers in many regions and countries were still allowed to sell and even experienced increasing demand.

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*Both demand and material supplies will remain fluctuating and uncertain in the coming weeks on the way out of the Corona lock down, and it will continue to be difficult to book sufficient transport capacities at an acceptable price.*

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In recent weeks, some companies have had to learn that various suppliers had diverted promised deliveries of scarce products to customers who were prepared to pay higher prices. In the case of medical protective equipment, this effect has become known to the general public through the swoop of promised supplies by the United States. A clear majority of the respondents did not have such experiences or at least do not expect any consequences for future supplier relationships. 49% of those surveyed expect rather no consequences and 18% see no consequences at all, whereas 23% can rather imagine that supplier relationships could be terminated due to dubious behavior and 10% are convinced of this.

International transport capacities by sea, land and air will also have a decisive influence on supply security in the coming weeks. 81% of those surveyed are convinced that transport capacities between Europe and the USA and Europe and the Far East will remain scarce and expensive in the coming weeks. 18% do not see this happening at first and 1% are convinced that it will not occur.

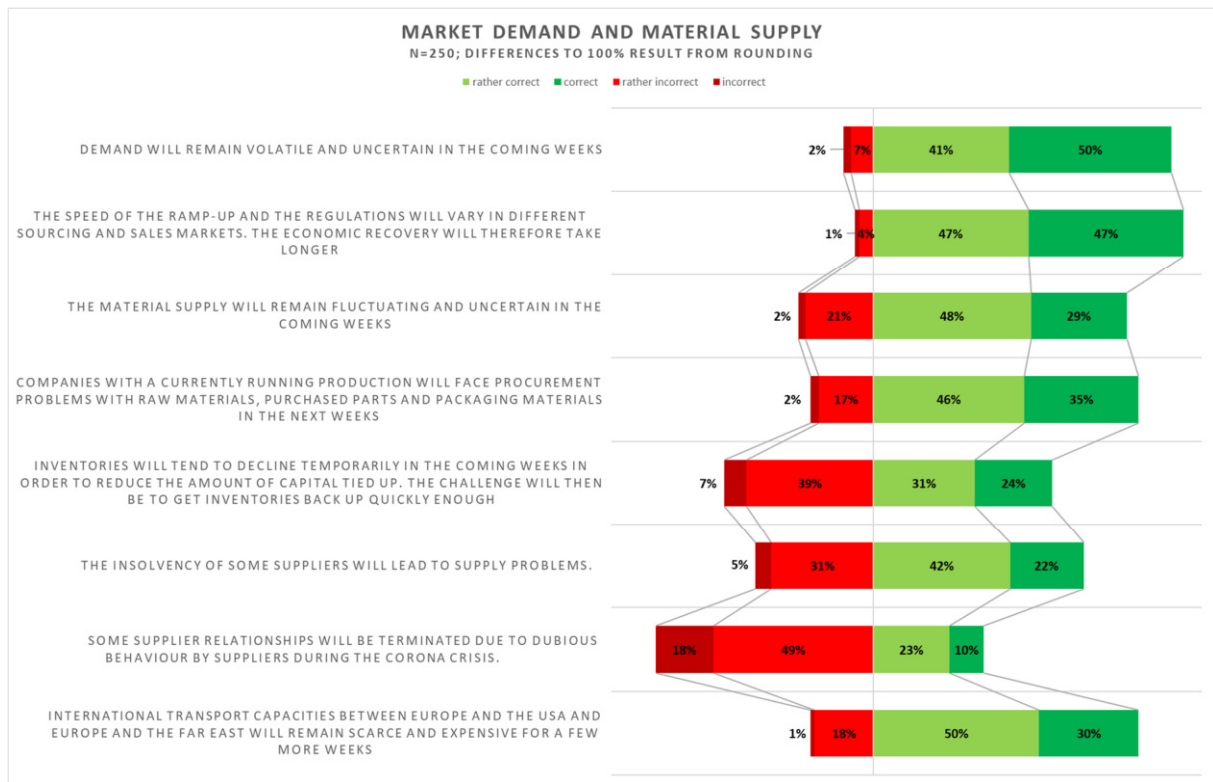





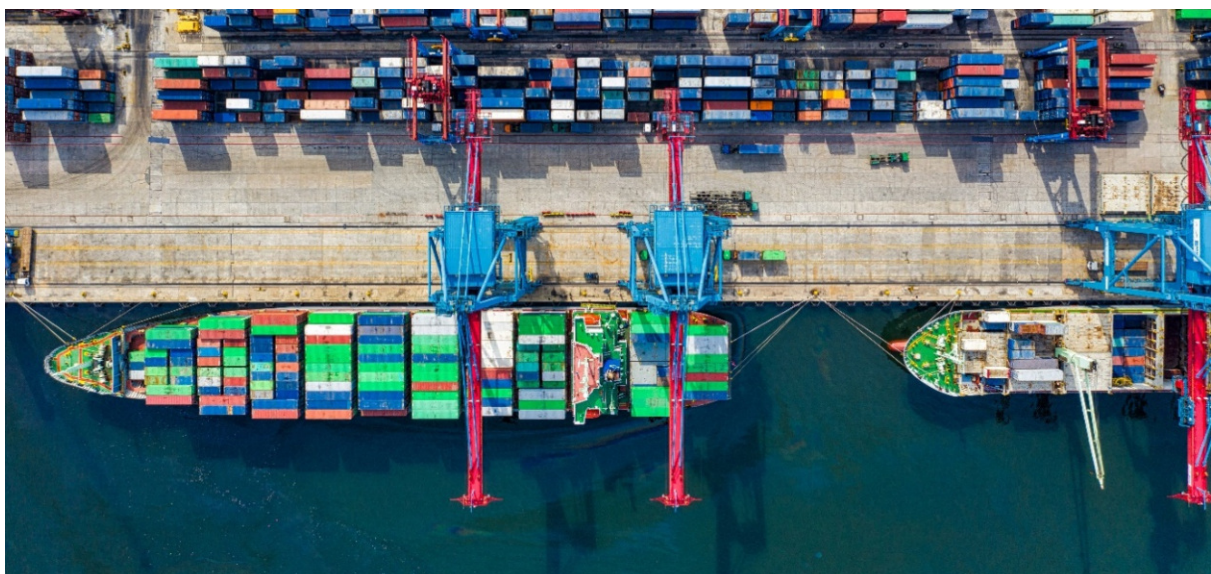


Figure 1: How will market demand and material supply develop in the coming weeks on the way out of the corona lock downs?

In summary, an overwhelming majority of the experts surveyed expect that both demand and material supply will remain fluctuating and uncertain in the coming weeks on the way out of the Corona lockdown and that it will continue to be difficult to book sufficient transport capacities at an acceptable price. Expectations that inventories will have to be reduced for liquidity reasons and that some suppliers will go into insolvency are clearly divided. This probably reflects the correspondingly heterogeneous economic situation in the various economic sectors.

First Recommendations for action (more to come):

	Be prepared for fluctuating demand and an uncertain supply situation
	Be prepared for fluctuating personnel availability
	Do not try to solve possible liquidity problems by saving stock at the expense of readiness to deliver
	Use a central, consistent requirements planning. Nobody knows exactly what is coming, but everyone must be prepared for the same demand expectations. It has always been wrong for everyone to plan according to their own gut instincts, but now it is getting dangerous.
	Check whether the calculation of your free-delivery-conditions, still works out and try to share the increase in freight costs with your customers. Everybody faces this challenge; also, your competitors.



## Staff productivity

Much has been done in recent weeks to reduce the risk of infection in the office and production areas of companies: separating staff into "contamination groups" which have no contact with each other, working in the home office, separate work places to maintain the required distance of 1.5 to 2 metres between people, wearing masks, providing disinfectants, distributing staff between shifts ([Kemmaer 2020](#)). All these measures will have a significant impact on staff availability and productivity.

The experts surveyed take a very differentiated view of this. For example, almost two thirds of those surveyed expect staff availability to fluctuate sharply in the coming weeks due to cautious sick leave and quarantine. 13% of the participants are very sure it will happen. However, a good third of those questioned doubt staff fluctuation will be an issue and 4% are convinced that this will not happen.



1.5 to 2 meters safety distance and face masks have become standard in all production and office areas. Will this be enough to counter the employees' fear of infection? Or will further safety measures have to be installed to avoid insecurity, frequent sick leave and consequently loss of productivity? 61% of those surveyed are certain or rather certain that such supplementary measures will have to be implemented, whereas 29% think that this is rather superfluous and 10% are convinced that the existing safety rules will be sufficient to reassure the workforce in the coming weeks.

The distance requirement in production forces many companies to operate shifts even in departments where employees are not used to this. Will this lead to stress and dissatisfaction among the employees concerned? Here, too, the opinions of the experts differ widely. 61% rather or clearly expect that there



will be additional strain and dissatisfaction among the employees, whereas three out of ten rather do not expect this and 8% are convinced that the temporary unaccustomed shift operation will not bring any strain and dissatisfaction among the affected employees.

In the administrative areas it is easier to “avoid each other” than in the production area, because here the possibilities for mobile working or home office are often given. Nevertheless, more than half of the experts surveyed expect that productivity will also suffer in administrative areas. 12% of those surveyed do not see this at all and 32% rather do not expect it.

*Due to the short-time working regulations that have been introduced to enable companies to retain their staff, three in four respondents is certain or fairly certain that staff will not be laid off.*

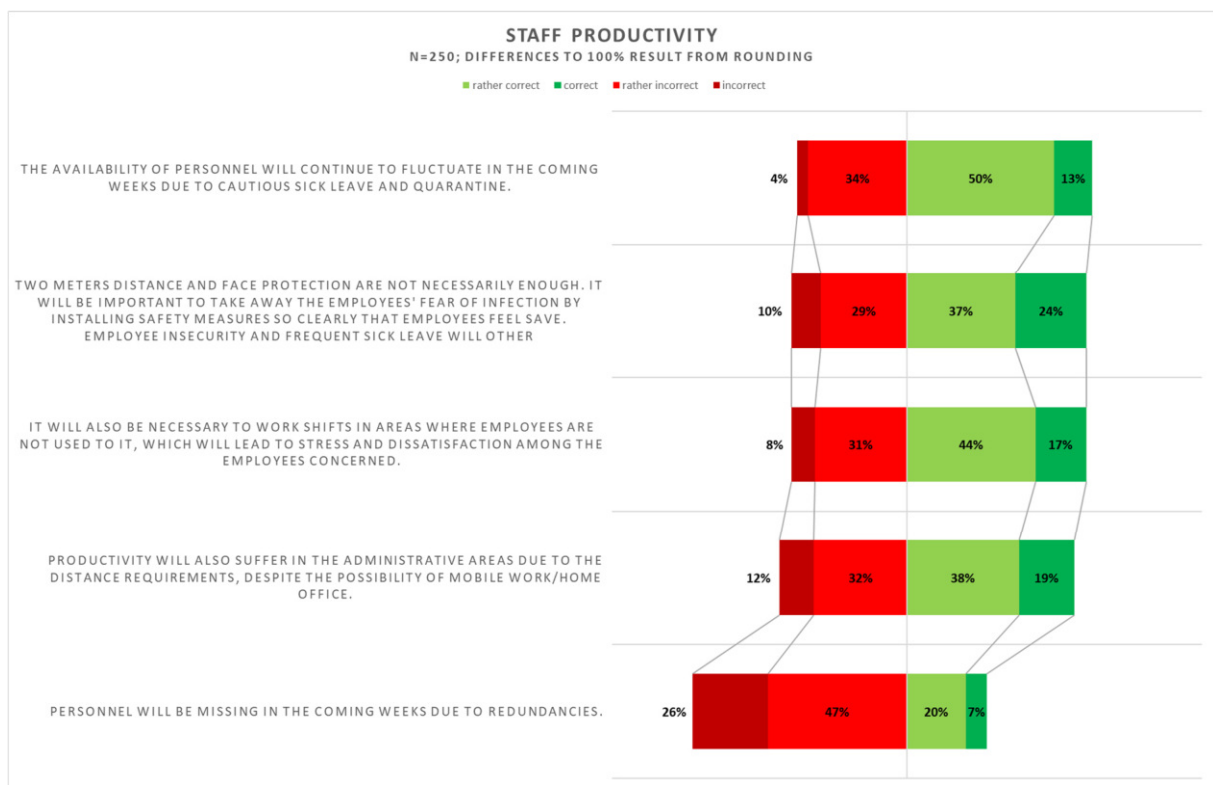
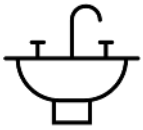
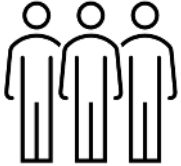


Figure 2: How will staff productivity develop over the next few weeks as we move out of the Corona Lock Downs?

A clearly uniform picture emerges regarding the question of staff shortages due to redundancies. 73% of those surveyed assume that this will not be the case. 26% are absolutely sure of this and 47% quite sure. Only 7% of those questioned are convinced that there will be redundancies and consequently a shortage of personnel. These figures express great confidence in the concept of short-time work compensation.

In total, two thirds of those surveyed expect additional burdens and lower productivity among employees as well as fluctuating personnel availability in the coming weeks. Due to the short-time working regulations that have been introduced to enable companies to retain their staff, three in four of those surveyed are certain or fairly certain that there will be no redundancies in the next weeks. Fig.2 shows the answers in detail.

#### First Recommendations for action (more to come):

	<p>Go beyond objective hygiene requirements to meet the safety needs of employees. This will help to keep sickness rates low and counteract the dissatisfaction caused by additional workloads</p>
	<p>Design the group division of clerks flexibly. Some must work at home because they have to look after children. Some cannot concentrate at home and others are more productive at home than in the office. There should be sufficient office space in the moment to accommodate everyone and increase productivity</p>



## Economic efficiency

Many companies, above all the catering and hotel industry, have been completely or largely closed by decree. Production and trading companies, which are still allowed to operate economically, can consider themselves lucky. Despite fluctuating demand and problems with the supply of parts, they at least have the chance to find their way through the crisis. However, the survey participants also expect these companies to suffer significant wounds. The overwhelming majority of 89% of the experts surveyed are certain or fairly certain that it will be difficult to maintain an economic production under the fluctuating disturbance variables. 2% see no problem at all here and 10% expect rather no problem.

*Profitability will also remain a major challenge for production and trading companies. Losses in productivity are expected; securing cash flow is the order of the day.*

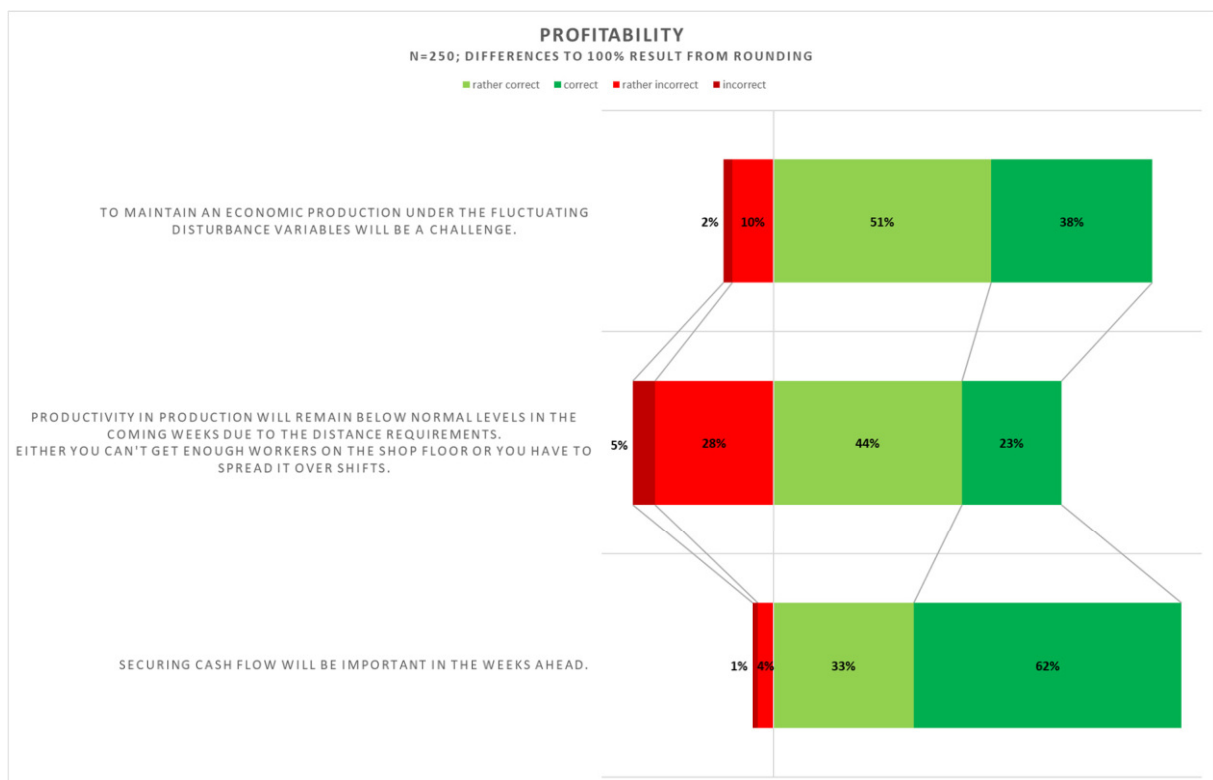




Figure 3: How will the profitability of companies on their way out of the corona lock downs look in the next few weeks?

Practically all respondents (95%) are convinced that securing cash flow will be very important in the coming weeks. 62% are certain of this and a third of those surveyed are fairly certain.

Opinions are somewhat more broadly based on the question of whether productivity in production will remain below normal levels in the next few weeks because of the distance regulations. 33% of those surveyed do not or rather do not expect this, while 67% rather or certainly assume that there will be lower productivity.

#### First Recommendations for action (more to come):

	Uncertainty and corona-related restrictions will continue for some time to come. Ask your employees specifically where they see their productivity as being hindered and ask for suggestions for improvement
	Now is the time to switch from CAPEX (Capital Expenditure) to OPEX (Operational Expenses) in order to better synchronize your expenses with your revenues.





## The supply chain world after the corona crisis: Long-term changes in supply chain management that will result from the corona crisis

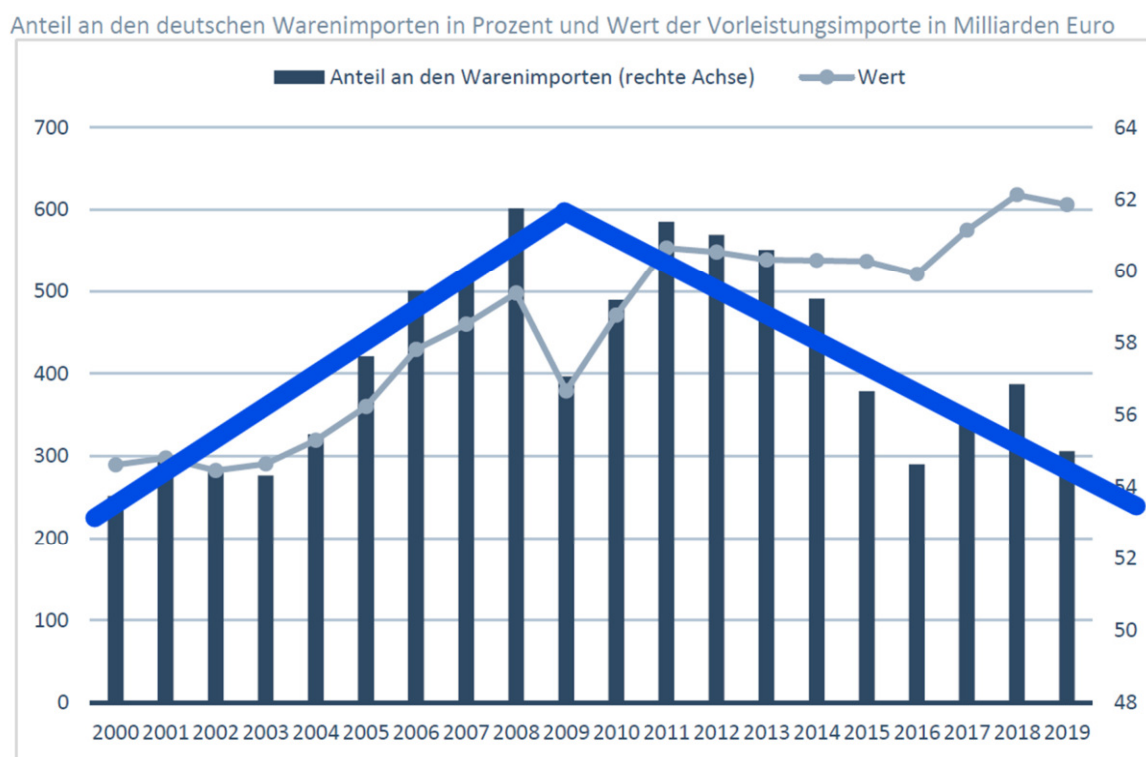
Three or four months ago, nobody would have imagined the drastic changes in the economic world and in the private lives of billions of people resulting from the corona crisis. Crises do not only change the situation during the existence of the crisis, but mostly lead to long-term changes. Also, after the 2008/2009 economic crisis, the economy has changed significantly. What will have changed substantially after the corona crisis will have been overcome? Will everyone return to *business as usual* or will there be significant changes in the supply chain world? The second part of the survey tries to shed some light on the expected changes, focusing on six topics:

- Changes in the supplier structure
- Shifts in procurement markets
- Changes in transparency and security requirements for supply chains
- Changes in digitalization and remote work in supply chain management and operations
- Changes in personnel flexibility
- Shifts in the target criteria of supply chain management



## Changes in the supplier structure

A recently published study by Galina Kolev and Thomas Obst of the Institut der Deutschen Wirtschaft (Institute of the German Economy) ([Kolev/Obst 2020](#)) has looked at the dependence of the German economy on international supply chains. In 2019, German companies imported products worth €1.1 trillion. 55% of the total goods imports (606 billion) concerned preliminary products that were further processed in Germany. As figure 4 shows, the absolute value of imported preliminary products increased significantly over the last 20 years. It is interesting to note, however, that the share of intermediate products in total goods imports has fallen significantly from 62% to around 55% on average since the economic crisis of 2008/2009.



Quellen: Eurostat; Institut der deutschen Wirtschaft

Figure 4: Share of intermediate products in the total goods imports of the Federal Republic of Germany in percent and absolute values of imported intermediate products ([Source](#): Institut der deutschen Wirtschaft IW-Report 16/2020)

It looks as if the first reshoring has already taken place in the last ten years. What changes do the interviewed experts expect in this context based on the experiences from the corona crisis?

Practically half of the respondents (Fig. 5) are very sure (10%) or relatively sure (39%) that many companies will increase their vertical integration again in the future. The other half of the respondents are of the exactly opposite opinion. 4% are absolutely sure and 48% relatively sure that this will not happen in the future.

The answer to this question illustrates the different situation of the companies of the surveyed experts. For retail companies, reducing the vertical range of manufacture is not an option open to them. Taking

into account that about one third of the companies surveyed are retail companies and that many of the manufacturing companies produce a large proportion of retail goods, the experts' answer indicates that more thought is being given to reducing the vertical range of manufacture in the manufacturing companies than the figures would seem to suggest. In the further course of the survey, the experts will show with some certainty that the reduction of purchase prices will remain a key target figure even after the crisis. From the interaction of these two assessments it can be concluded that in the future, more thought will be given to a *make* instead of a *buy*, but a clear trend is unlikely to be sustained in the long term.

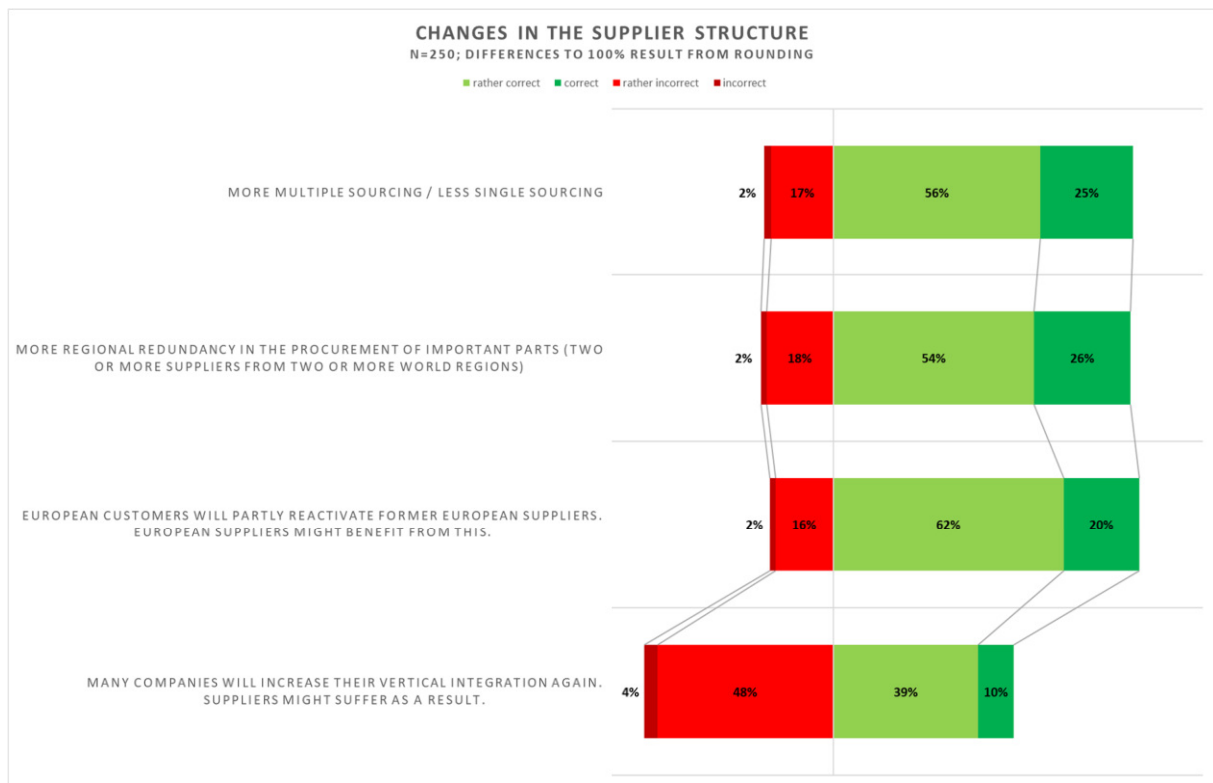


Figure 5: Long-term changes in the supplier structure expected as a result of the Corona crisis




*More multiple sourcing from several world regions and a reorientation towards European suppliers. Production companies will think about a higher depth of value added. However, this will not have a significant impact on the supplier market.*

Nevertheless, as the further answers of the interviewees show, there will be significant changes in the supplier structure. More than 80% of the respondents assume that there will be less single sourcing and more multiple sourcing.



Similarly, the opinion prevails that there will be more regional redundancy in the procurement of important materials in the future (26% is correct, 54% is more likely to be correct). Important products will be procured in a targeted manner from several sources in different regions of the world in order to reduce the vulnerability to crises in individual regions of the world. 82% of the experts strongly or rather assume that European customers will again make greater use of former European suppliers. Reshoring in a European context is therefore also clearly indicated here. The clear statement that the experts make here is consistently underpinned in the next question on the shifts in the procurement markets.

#### First Recommendations for action (more to come):

	<p>For A- and important B-articles, rely on several suppliers from different procurement regions, if this is possible at all</p>
	<p>When making purchasing decisions, consistently consider the <i>total costs of ownership</i> and not just the purchase price</p>
	<p>Use your chance as a supplier to win new European customers</p>



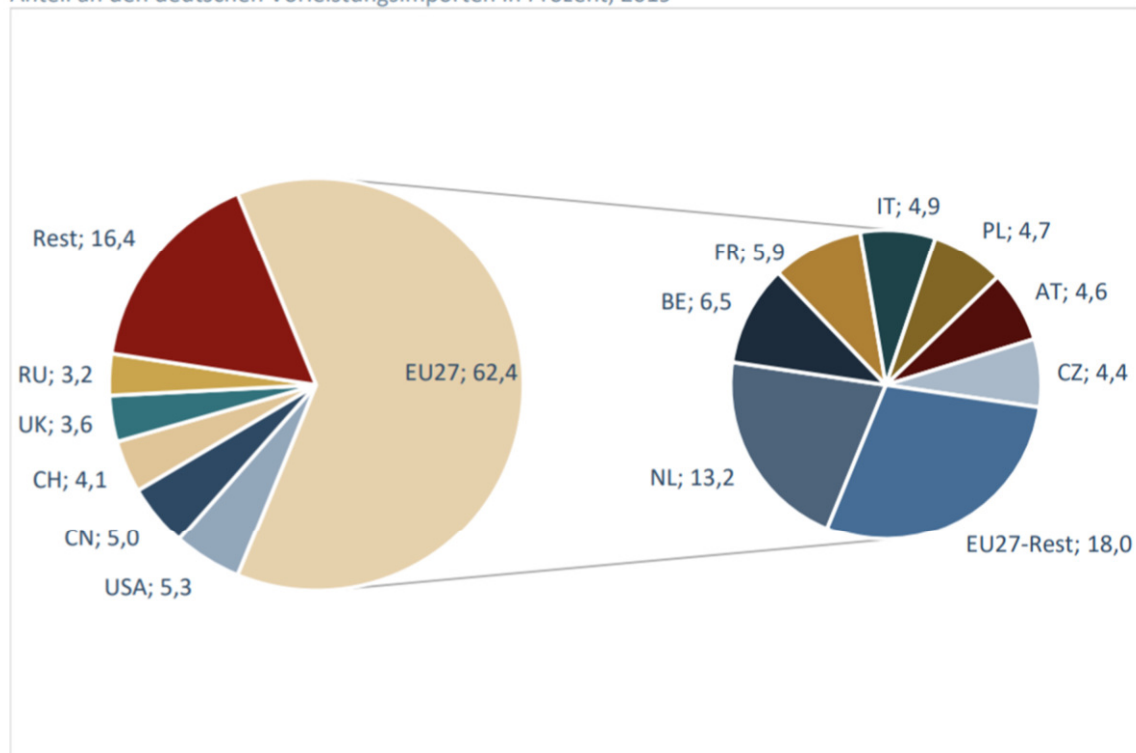


## Shifts in procurement markets

When asked about the changes in the supplier structure, shifts between procurement markets were already apparent. In another question we asked which regions of the world will profit and which could lose.

Let us first look at the current significance of the various procurement markets from a German perspective (Fig. 6). Here, too, the study by Kolev/Obst (Kolev/Obst 2020) provides interesting figures. According to statistics, almost two thirds of the preliminary products imported in Germany come from EU member states. The Netherlands stands out as the formally largest single supplier country. However, the import figures from the Netherlands include a port effect. Not all international imports that reach Germany via Dutch ports, in particular Rotterdam, can be clearly identified as such in the statistics. A significant part is shown in the statistics as Dutch imports. But even if one cautiously corrects the import share of the Netherlands from 13.2% of all EU imports to 4%, more than 50% of all intermediate products imported in Germany still come from EU member states, with the UK already being excluded from the EU in these statistics and, logically, Switzerland, which after all stands for 4.1% of German intermediate product imports, also being excluded.

Anteil an den deutschen Vorleistungsimporten in Prozent, 2019



Quellen: Eurostat; Institut der deutschen Wirtschaft

Figure 6: Percentage distribution of German intermediate input imports from various supply regions and countries (Source: Institut der deutschen Wirtschaft IW-Report 16/2020)

According to the experts surveyed, the European share of imported products is likely to continue to increase overall (Fig. 7).

Two-thirds of the experts expect a significant or slight increase in imports resp. sourcing from the DACH region (Germany(D), Austria(A), Switzerland (CH)) (significant increase 16%, slight increase 51%). Only 8% of the experts expect a slight or significant decrease in procurement volumes from the DACH region. 24% expect no change here or have no opinion.

Similar to the DACH region, a clear majority of 60% of the experts are convinced that procurement volumes from the EU Member States including Norway will increase. 32% do not expect any changes or have no opinion and again 8% of the experts expect a slight or significant decrease in procurement volumes from other EU countries including Norway.

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*All in all, the experts surveyed expect globalization in procurement to decline. A tendency "back to Europe" is discernible.*

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The assumptions for Great Britain as a procurement market are practically reverse to the expectations for the EU supply region. Almost two thirds of the experts expect a significant decrease (18%) or slight decrease (47%) in import volumes from the UK, while only 7% expect a significant or slight increase. The remainder see no changes or believe they are unable to assess the development. This expected significant decline in imports from the UK is likely to be due not only to the corona crisis but also to the UK's withdrawal from the EU.

Turkey and North Africa also appear to be losing importance as EU-related procurement markets. Regarding Turkey, 49% expect a slight or strong decrease and only 6% of the respondents expect a slight or significant increase. 45% do not expect any change or have not made any assessment.

Also, for North Africa a slight majority (57%) expects no changes or has no opinion. Of those respondents who think they can assess the situation, 41% expect the volume of procurement from the Maghreb countries to decrease and only 2% expect a slight increase.

The experts also expect a loss of significance for the important procurement market China and the rest of the Far East. 16% of those surveyed expect a significant and 50% a slight decline in procurement volumes from China. The figures for the rest of the Far East are 8% (sharp decline in purchase volumes) and 44% (slight decrease) respectively. Only 10% expect a slight (rest of the Far East 11%) and 2% (rest of the Far East 1%) strong increase in procurement volumes for China. 22% of those surveyed expect no change in procurement volumes from China and 36% expect procurement volumes from the rest of the Far East to remain constant.

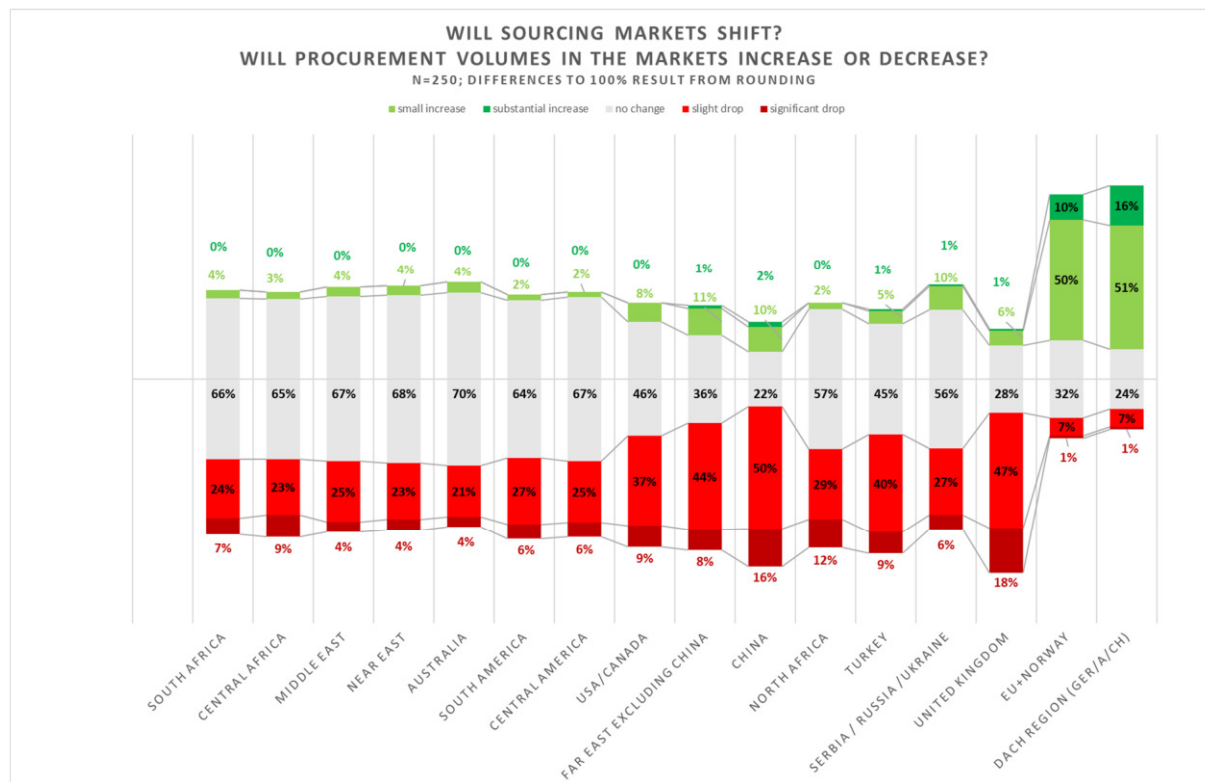


Figure 7: Long-term shifts between procurement markets expected as a result of the corona crisis and presumably other effects

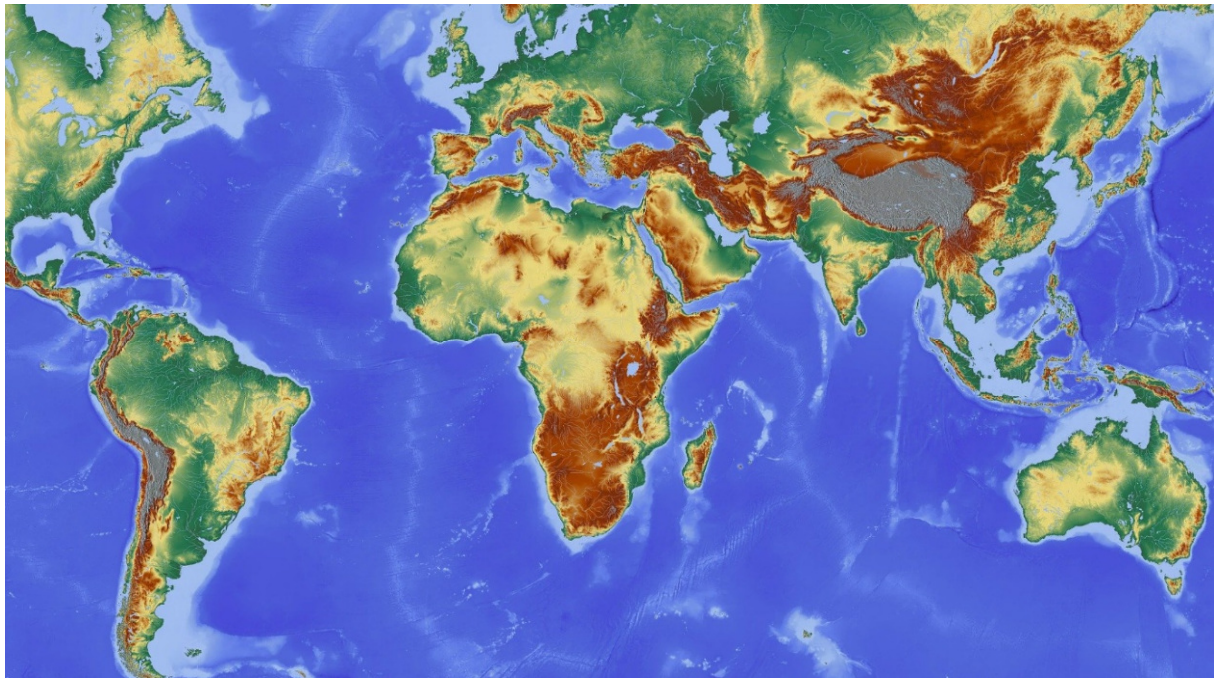
Another major procurement market for Germany is North America. Here, 46% of the respondents expect no change or do not see themselves in a position to make a valuation. It is significant, however, that only 8% of those surveyed expect a slight increase in procurement volumes from the USA and Canada, while 37% expect a slight and 9% a significant decrease in procurement volumes from the United States and Canada.

For the remaining procurement markets, it can be stated in summary that roughly two thirds of the experts do not expect any changes or do not feel able to assess the situation. Only 2% to 4% of those experts who think they can assess changes expect a slight increase in procurement volumes from these markets. In contrast, one quarter to one third expect slight or significant decreases in procurement volumes.

All in all, the respondents expect globalization in procurement to decline. The sourcing region DACH, EU member states and Norway will gain significantly more importance, the Far East including China will decrease in its importance somewhat. The remaining global procurement markets will also tend to lose. In addition to the expected effects of the Corona crisis, this assessment certainly also, and perhaps even primarily, includes other effects, such as the withdrawal of Great Britain from the EU, the erratic behavior of the American Federal Government and the increasing economic aggression of China. Against this background, the assessment of the experts surveyed is even more important.

In combination with the still relevant aspect of price reductions in purchasing, which we will come across in the further report, and taking into account the already high procurement volume of

intermediate products from the EU, we do not expect any unbundling of the global economy; however, a trend of "back home" is clearly emerging.



First Recommendations for action (more to come):

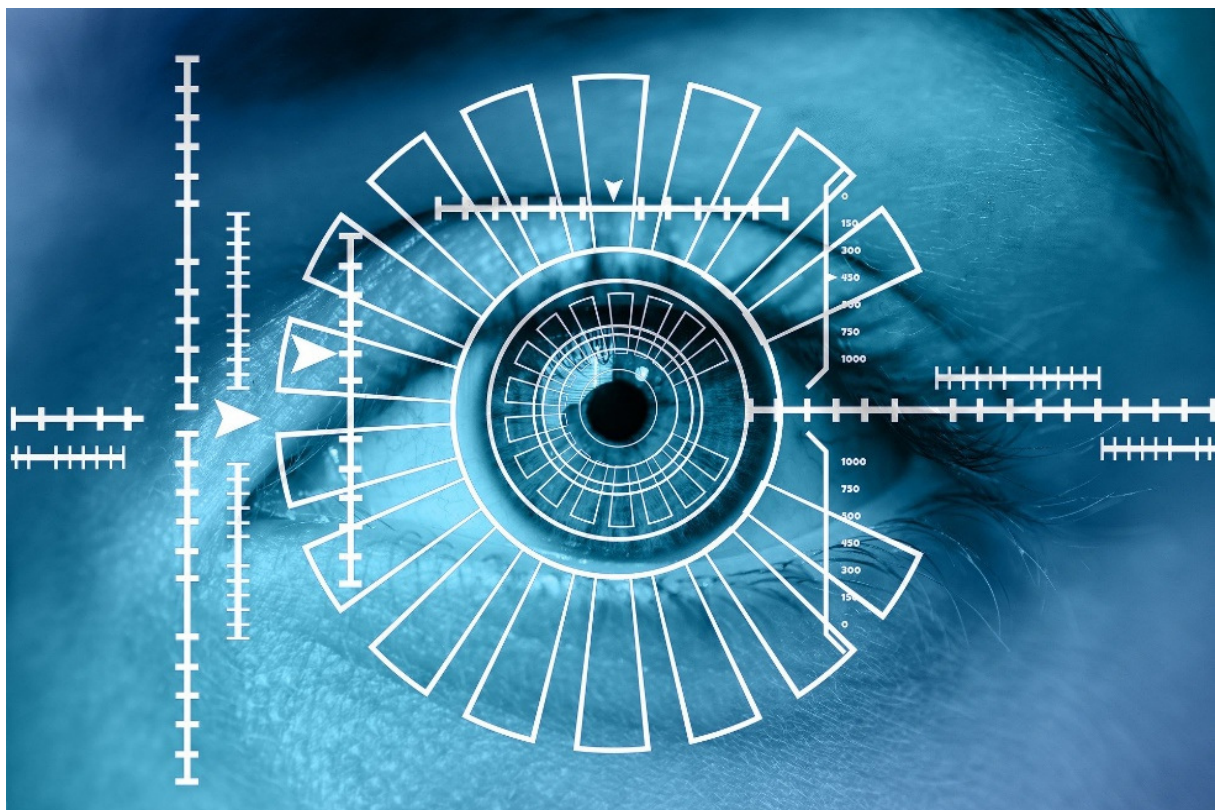
	<p>The Corona crisis has hit Europe hard economically. Investigate your procurement opportunities in the European markets. When procurement markets rebalance themselves, first movers have the best chances</p>
	<p>Search consistently for primary products that can be sourced from European procurement markets, considering the <i>total supply chain costs</i>, which also include costs for risk minimization. This reduces complexity and risks in your supply chain and increases its transparency</p>



## Changes in transparency and security requirements for supply chains

In all larger companies, supply chain risk management is an essential component of good corporate governance. In medium-sized companies the topic is handled more loosely. But even in many larger companies, risk management did not sufficiently recognize the expected effects of a pandemic. The corona crisis is certainly not a black swan, as is often argued. 26 regional or transnational epidemics ([Wikipedia 2020](#)) have broken out in the last 25 years and had at least limited impact on specific national or international supply chains. The World Health Organization has been warning us for many years that one day a pandemic will happen.

Of course, a pandemic like COVID-19 poses particular challenges for risk management. It will always remain difficult to reduce risks in a forward-looking manner, especially those of extremely low probability of occurrence, yet extremely high potential of damage. Many companies are currently experiencing that this risk can hardly be covered by actuarial methods and that pandemics are therefore not covered by most business interruption insurance policies.



Risks in supply chains can only be identified, evaluated and mitigated if there is an overview of the entire supply chain network. Supply chain transparency is therefore an essential prerequisite for successful risk management. In few industries today, supply chain transparency has reached the point where supply chains are disclosed "back to the mine". In many cases, companies do not even know the suppliers of their suppliers completely. In general, suppliers find it difficult to reveal their procurement networks to customers; fears of competitive disadvantages are predominant. In many cases, the lack of transparency in the supply chains is even greater. Not even within a corporate network do some

companies have a consistent view of their value chains. This raises the question of whether the corona crisis will trigger lasting improvements in supply chain transparency and supply chain risk management.

Almost all respondents (Fig. 8) are very sure (34%) or relatively sure (57%) that supply chain risk management will be significantly expanded. The experts are not quite as convinced that supply chain transparency will be driven forward down to the last supply link. But still four out of five respondents expect this, while another 20% are rather or definitely not expecting it.

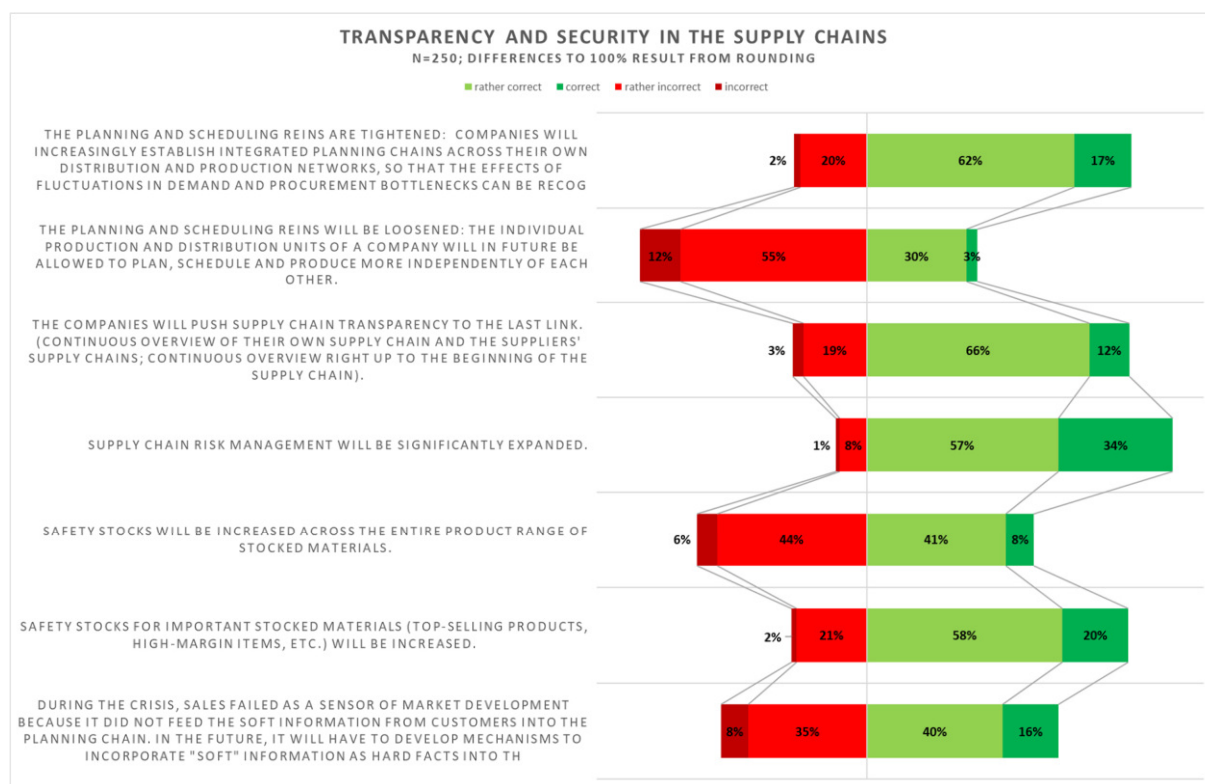


Figure 8: Long-term changes in supply chain transparency and supply chain security expected as a result of the corona crisis

Safety stocks are an essential element in cushioning risks in supply and value chains. Nearly four out of five respondents therefore assume that safety stocks of important stocked materials will be increased in the future (20% very sure, 58% relatively sure). At least a good fifth of those surveyed do not expect this to happen, and only 2% are convinced that safety stocks of important materials will not be further increased in the future.

The opinions of the experts are clearly divided as to whether safety stocks should be increased across the entire range of stocked products. While 50% are convinced or rather convinced of a product portfolio wide increase in safety stocks, the other 50% assume that this will rather not or definitely not happen.

In order to improve risk management and supply chain transparency, 79% of the participants rely on a consistent planning chain in order to tighten the planning and scheduling reins in a supply network. Conversely, two-thirds of the experts surveyed do not (12%) or rather do not (55%) expect that the

planning and scheduling reins will be loosened in the future and that companies will grant more leeway to the individual production and distribution nodes.

A consistent planning chain allows to react quickly when changes in the demand structure become apparent on the market. It is a truism that the quality of the planning corresponds to the quality of the market information that sales feeds into the planning chain.





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*Supply chain risk management will be significantly expanded, planning and scheduling will be tightened, and integrated planning chains will be established.*

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Contrary to the illusion of many planners, in most cases sales has only limited influence on and insight into market developments; unfortunately, the crystal sphere is missing. In many cases, however, the sales department has qualitative, soft information which is difficult to formalize and to enter into the planning chain via classic channels. Has sales failed as a sensor of market development during the crisis? Will it have to develop new mechanisms in the future to be able to incorporate soft information as hard facts into the planning process? The opinion of the interviewees is divided. 40% of the experts rather agree with this assessment, 16% consider it to be accurate. In contrast, 35% rather disagree with this assessment and 8% definitely reject it.

#### First Recommendations for action (more to come):

	<p>Set up consistent planning chains and specify the planning and replenishment strategies centrally. This requires central and dynamic control of the planning and scheduling parameters</p>
	<p>Switch (finally) to a dynamic and statistical calculation of safety stocks. For particularly important articles, you can increase the safety stock using a safety stock factor</p>
	<p>Make "disclosure agreements" with your suppliers: Your suppliers name their sub-suppliers; you commit yourself not to approach these sub-suppliers directly.</p>
	<p>Demand that your suppliers also conclude disclosure agreements with their upstream suppliers</p>





Check your supply chain risk management for gaps that have become apparent in the corona crisis





## Changes in digitalization and remote work in supply chain management and operations

No digitalization initiative, powered by billions of euros in expenditure and five-year plans, could have achieved as much as the Corona crisis. This is symbolized by the proportion of employees working in the home office. According to a study conducted by the Bavarian Research Institute for Digital Transformation ([BidT 2020](#)) in March 2020, before the corona crisis 23% of the working population in Germany worked at least once a week from their home office. 39% now work from home several times a week (BidT 2020; Fig 9). And surprisingly, companies have coped well with this significant change. More than 70% of the professionals surveyed by BidT considered their employers as being rather well or very well prepared for the expansion of home office.

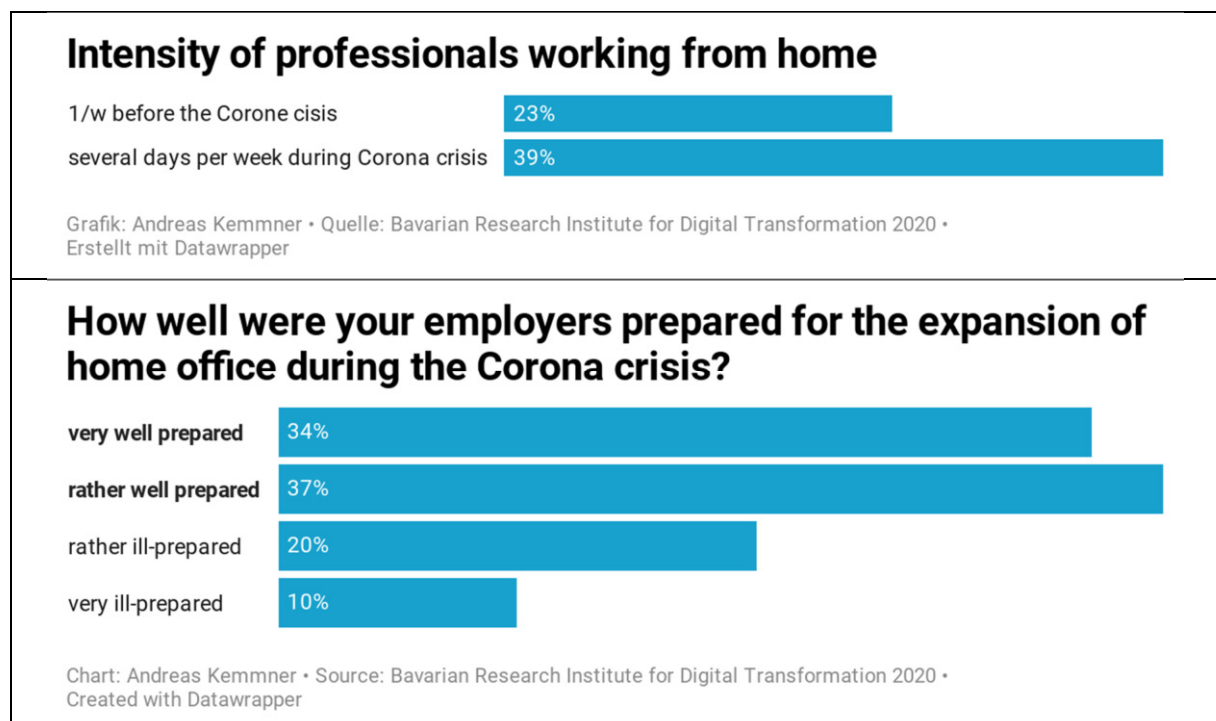


Figure 9: The proportion of professionals working from the home has increased significantly during the corona crisis. A large proportion of companies were well prepared for an increase in home office work (source and graphs: [Bavarian Research Institute for Digital Transformation 2020](#))

Suddenly, we realize that more is possible in terms of digitization in our companies than we would have generally expected. But the stress test of the Corona crisis has also made it clear to all companies that there are still gaps in digitization. Will digitalization and remote work remain in supply chain management and operations after the corona crisis? This was another question we posed (Fig. 10).

86% of the respondents rather (54%) or certainly (32%) expect a general digitalization push in the entire supply chain management. The expectation that software support in supply chain planning will be expanded is about as high (86%).

One specific question was devoted to the digitalization of freight documents. In recent weeks, many companies have experienced that freight handling has been significantly hindered by the still paper-

heavy processes. 27% of those surveyed are very sure and 59% relatively sure that digitization will now also progress rapidly for freight documents.

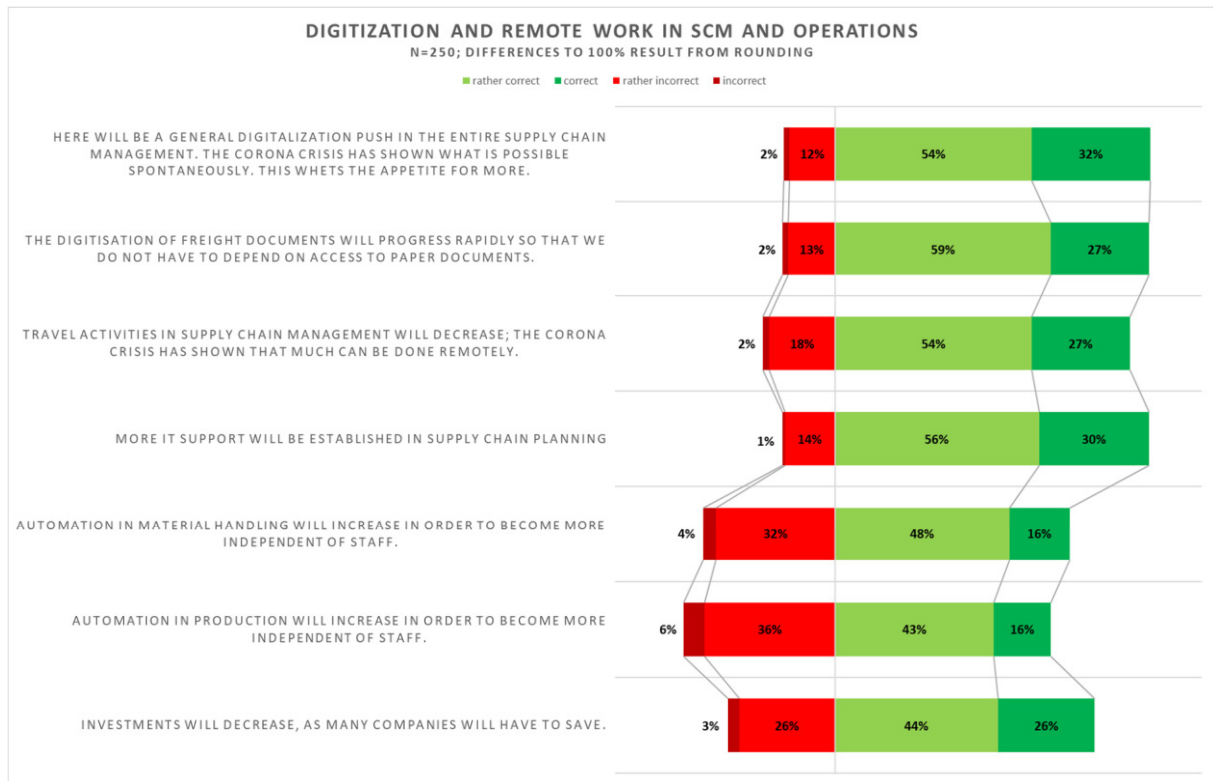


Figure 10: Long-term changes in digitisation and remote work expected as a result of the corona crisis



That many tedious business trips can be replaced by video conferencing has been learned by many managers and employees in recent weeks. A clear majority of 81% of the experts is convinced that it will be possible to avoid most business trips also in the long term. 54% of those surveyed are rather sure and 27% are quite sure that in the future and in the long term, less travel will be made in supply chain management.

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*Digitization and remote work in supply chain management will advance and less travel will be required.*



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Overall, the experts are not quite convinced that automation in production and material handling will increase in order to make companies less dependent on people.

32% of the participants rather not and 4% definitely not expect this. The expectations regarding automation in production are similar. Here, 42% expect no (6%) or rather no (36%) increased automation for reasons of rationalization. Ultimately, however, a majority of the experts foresees an increase in the level of automation in production (59%) and in material handling (64%). In connection with the goal of automation, which is also mentioned in the survey, it is apparent that many experts do not see the primary goal of automation in production and material handling as replacing personnel.

Digitization and automation cost money, which is only available to a limited extent in these difficult economic times for many companies. 26% of the experts are therefore certain and 44% quite sure that investments will decline. 26% do rather not expect this to happen and 3% do not expect it at all.

#### First Recommendations for action (more to come):

	<p>Take stock from the stress test of the Corona crisis: Where has digitalization not worked? Use it to draw up an action plan on how to close these gaps within two years</p>
	<p>Save consistently on business trips. If there is nothing to see, feel, smell, taste or touch on site, then use video conferencing and add up your CO2 savings</p>

## Changes in personnel flexibility

Working in staggered shifts, switching regularly between home office and office, replacing colleagues who are ill or in quarantine; working in an individual office, but not in the same one every day. The staff in those companies which were still able to produce, had to be very flexible during the corona crisis, and their flexibility has solved many problems. Will some flexibility remain after the corona crisis (Fig. 11)?

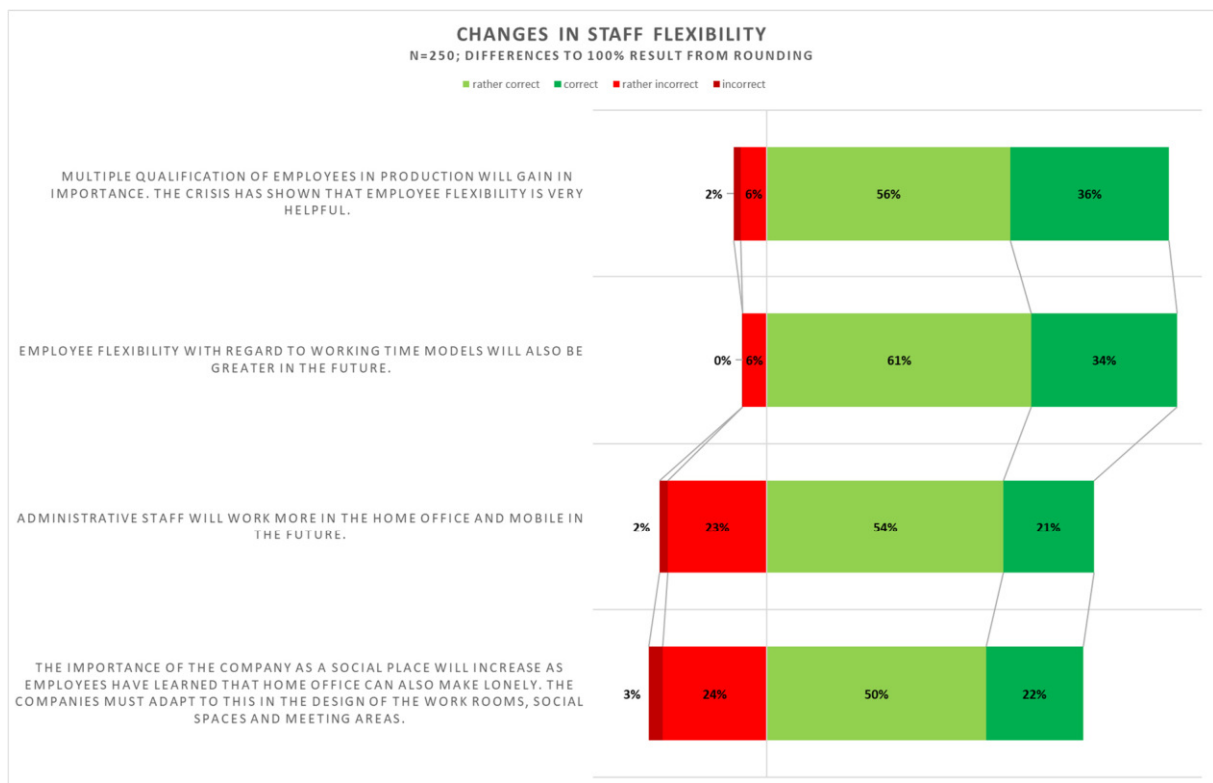


Figure 11: Long-term changes in personnel flexibility as a result of the corona crisis

Working at home is pleasant if you have a place for it at home and sufficient peace and quietness. But a permanent home office can also make you lonely. This differentiated experience is also expressed in the experts' assessment. Three-quarters of those surveyed are certain (21%) or relatively certain (54%) that administrative staff will work more from home and on the move in the future. Yet one quarter of the experts does not or rather not expect this to happen. In German politics there is an ongoing discussion about a right of employees to work from home if this fits into the company's processes. Perhaps politics are only following suit here with labour law regulations that the business world has already learned and implemented thanks to Corona.

An office represents more than a roof over a desk. Many desk workers, not only in supply chain management, have painfully experienced this in recent weeks. A company is also a place of social encounter. In recent years, more and more companies have recognised the importance of this aspect, which ultimately contributes to the motivation of the workforce, and have accordingly aligned the design of workspaces, social rooms and meeting areas; but this has not yet become a real trend. Will



more be done here in the future? The statements of the experts can be interpreted in this direction. Seven out of ten experts agree (22%) or rather agree (50%) with this statement, while the other three rather (24%) or definitely (3%) disagree.



On the other hand, the opinion of the experts is very clear about the future flexibility of employees in relation to different working time models. 34% of the respondents are convinced and 61% quite sure that the flexibility of employees will be greater in this respect in the future.

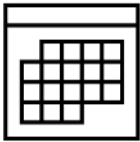


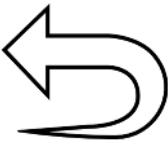
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*The time flexibility and professional flexibility of employees will be more appreciated in the future.*

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In addition to time flexibility, the professional flexibility of the employees, especially in production, also plays a major role. In recent weeks, many companies have experienced how helpful it is to have employees in production who, thanks to multiple qualifications, can be deployed flexibly in different areas of production. The expert group has a common view in this respect. 92% of the respondents assume that the multiple qualification of employees in production will gain in importance, only 8% see this rather and definitely not.

First Recommendations for action (more to come):

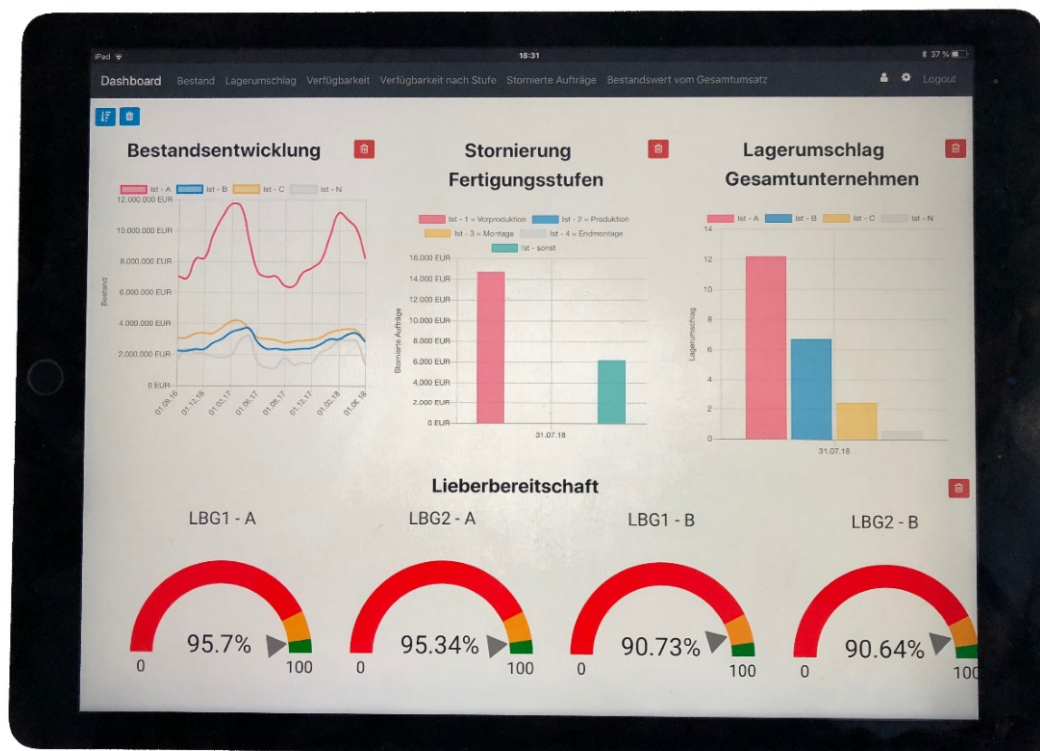
	Give your clerks the chance to work mobile one or two days a week if they wish. If it shows that someone cannot work productively from home, cancel the approval again; in the end it is a question of performance and consideration
	Ask your employees what makes working in the office fun. Meetings in the office build social relations with colleagues and thus directly and indirectly strengthen the bond to the company
	Rely on qualification matrices and consistently build up multiple qualification in production. Reward your staff financially in return.
	Enable clerks and managers to expand their horizons



## Shifts in the target criteria of supply chain management

Stocks, adherence to delivery dates, capacity utilization, throughput times, these four parameters are probably the classic target criteria in supply chain management and operations. A somewhat deeper and more differentiated view of the situation reveals additional target criteria. In the preparatory workshops for our survey, we identified 14 target criteria for which we inquired the experts. We asked the participants to assess whether the significance of the individual target criteria will increase slightly or strongly, or decrease slightly or strongly, or whether they do not expect any change.

Overall, it can be stated that a significant proportion of the experts do not expect any relevant long-term shifts in significance between the target criteria. Among the experts who foresee changes, opinions differ significantly on many target criteria (Fig. 12).



The answers to various preceding questions have already suggested that there is likely to be a clear shift in importance in the target criteria of risk management and redundancy among suppliers. The experts see a fairly clear picture about risk management. 89% of experts expect the importance of risk management to increase slightly (45%) or strongly (44%). 2% foresee a slight decrease and 9% assume that the importance of risk management will not change in the long term due to the experiences from the corona crisis.

The opinion is also uniform concerning supplier redundancy. Only 1% of the participants expect the importance of this objective to decrease significantly, 3% see a slight decline. 16% assume that the

importance of this target criterion will not change in the future. A clear 59% of the experts foresee a slight increase in importance and 22% expect this goal to be given high priority.

The experts' assumptions regarding the shift in procurement markets indicated already that supply chains will be rebalanced in the future and that the importance of local European suppliers will increase again. In general, purchase prices from European suppliers, if the products can be procured in Europe at all, are higher than in China and the Far East. In the past, the focus of purchasing on the price factor was a key driver of "Asian Sourcing". In contrast, it is interesting to note that practically half (46%) of the experts assume that the importance of the goal of reducing purchase prices will not change in the future. The proportion of experts who see a slight (25%) or significant (2%) decrease or a slight (19%) or significant (7%) increase in the price criterion is practically balanced.

Does this reflect the fatalism of many interviewees that purchasing never pays attention to anything but the price? Probably not! Material costs are a considerable part of the total costs in many companies, so it must be assumed, as already noted elsewhere, that the procurement trend back to Europe will not become a massive trend; unless it will be politically driven in that direction.

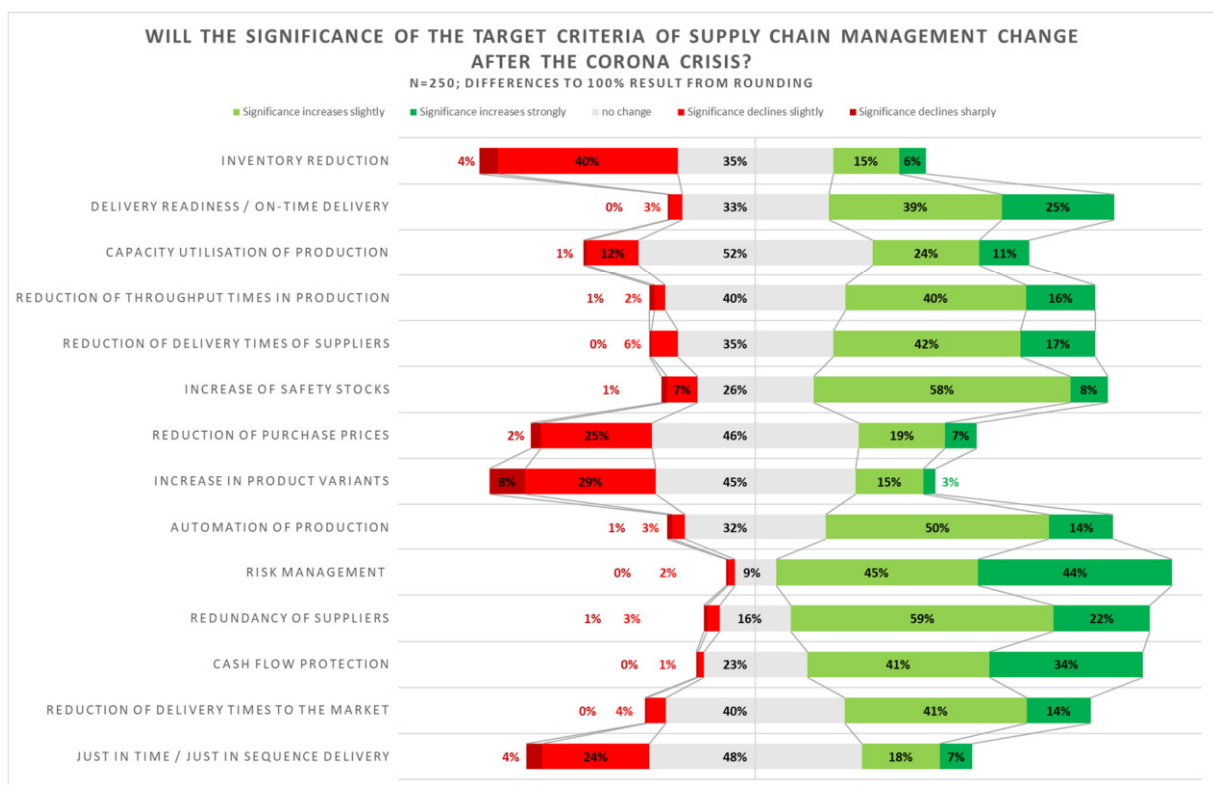


Figure 12: Long-term shifts in importance of key supply chain management target criteria as a result of the corona crisis

A similarly static picture emerges concerning Just in Time/Just in Sequence deliveries. It could be assumed that this process, which is associated with very low safety stocks, is likely to become less attractive due to the experiences made in the corona crisis. However, 48% of the experts see no change in the significance of this target criterion; only a slight overhang of 3% of the experts expect a decline in significance. This assessment is certainly influenced by the fact that most just-in-time/just-in-sequence processes involve very close spatial links between suppliers and customers and are therefore associated with low risks of disruption.



Just in time processes allow short delivery times on the procurement side. Short delivery times on the procurement side will generally gain in importance in the future, according to a clear majority of the participants. 17% see a significant increase in importance and 42% see the significance increasing at least slightly. Only 6% of the experts expect the significance to decrease. However, a good third assumes that the significance of this target criterion will not change.

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*Faster supply chains with a tendency towards higher safety stocks and more redundancy in supplier relationships, supported by more intensive risk management; favorable purchase prices remain important and cash remains king.*

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The experts' view of the future importance of reducing throughput times in production is analogous to expectations regarding delivery times on the procurement side. Here, too, a clear majority of 57% is convinced that reduced throughput times will become significantly (16%) or at least somewhat (41%) more important, whereas only 2% see a slight and 1% of the experts see a significant decline in the importance of throughput times in production. Even with this target figure, there is a considerable proportion of 40% of the experts who do not see any shift in importance in the future.

In addition to short delivery times from the procurement market and short lead times in production, the reduction of delivery times to the customer plays a major role in supply chain management. Will the reduction of delivery times to the market also become more important? A narrow majority of the experts agree with this as well. 41% expect a slight and 15% a significant increase in the importance of short delivery times to the market. However, 4 out of 10 experts do not see any change in the weighting of this target figure, and only 4% think that the importance of delivery times to the market will decline slightly.

All in all, it can be stated that most of the experts surveyed expect procurement, production and distribution chains to become faster in the future. Fast supply chains that are also shorter due to more regional procurement allow for agile supply chain management that can flexibly adjust to disruptions on the procurement and demand side, provided that sufficient stocks can cushion short-term disruptions. It is therefore not surprising that 44% of the experts expect the focus on inventory reduction to decrease significantly (4%) or slightly (40%) in the long term, whereas only 21% see the goal of inventory reduction as having a significantly (6%) or slightly (15%) higher weighting. Here, too, a good third of the experts surveyed expect no shift in importance in the future.

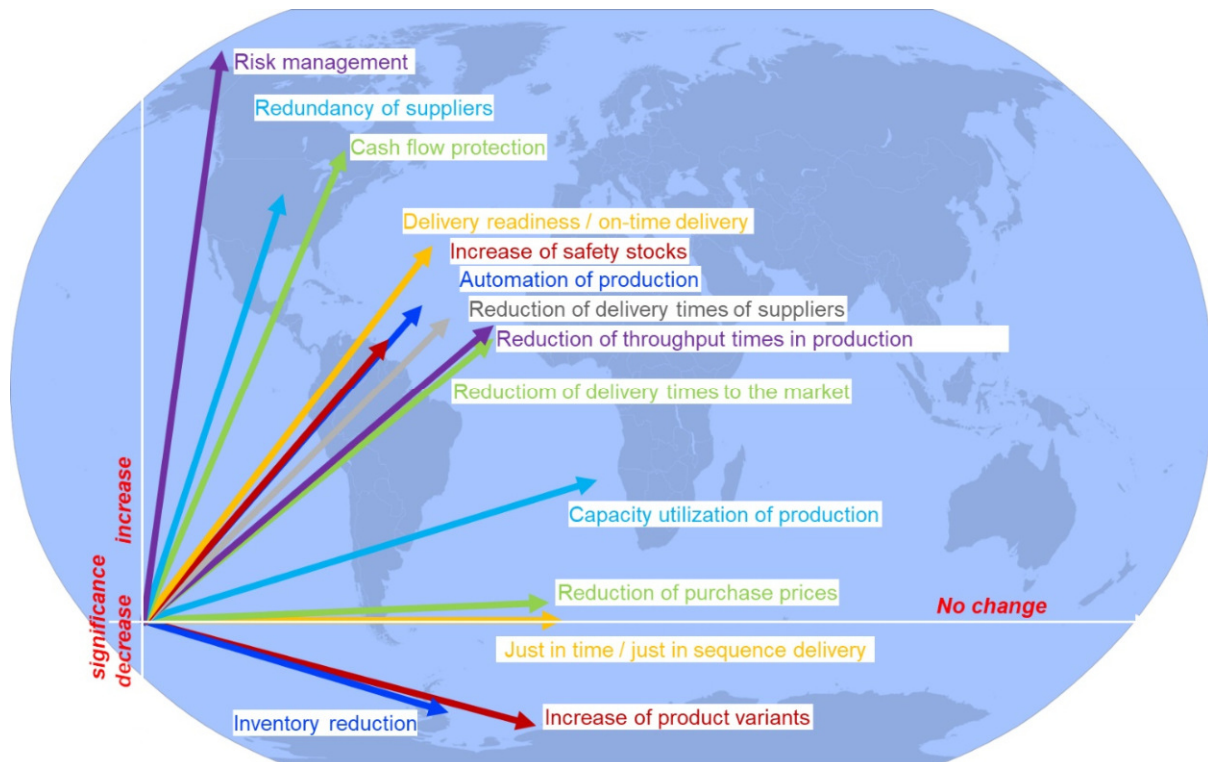


Figure 13: Vector visualization of the shifts in the target criteria (the longer the arrow, the clearer the statement; the steeper, the clearer the trend of change. The values were calculated by vectorial addition of the statements, whereby "strong increase" and "strong decrease" were represented as positive and negative Y-vectors, respectively. "Slight decrease" or "slight increase" were represented as Y-vectors with half the amount each. "No change" was considered as positive X-vector).

The experts give a clearer answer to the question of increasing safety stocks than to the question of reducing stocks. Only 1% of the experts surveyed assume that the importance of safety stocks will decrease strongly or slightly (7%), while a clear majority of 66% of the experts expect the importance of safety stocks to increase slightly (58%) or even significantly (8%); again, a good quarter expects no change.

Fast supply chains, reinforced with the right stocks, aim at readiness for delivery and adherence to delivery dates. Consequently, 6 out of 10 respondents expect that the importance of readiness to deliver and adherence to delivery dates will increase at least slightly (39%) or even strongly (25%) in the long term. Only 3% expect a slight decrease in importance and one third of the experts surveyed see no change in the prioritization of this target.

Manufacturing companies feel a permanent economic pressure to amortise their considerable investments through a high production capacity utilization. On the other hand, the goal of high capacity utilization is contrary to an agile supply chain and the flexibility of production required. A slight majority of the experts (52%) assume that the importance of capacity utilization in production will not change, while a good third sees a slight (24%) or strong (11%) increase in the importance of the capacity utilization target. Only just about one in ten experts can imagine that the importance of capacity utilization will decrease slightly or significantly in the future.



It is interesting to note that almost two thirds of the experts surveyed assume that the importance of automation in production will increase slightly (50%) or strongly (14%) in the long term and only a minority expects that automation will lose importance (slightly 3%, strongly 1%). At first glance, the unambiguousness of this statement contradicts the opinion of the experts surveyed as part of the digitization question. When asked whether automation in production will increase in order to become more independent of the human factor, 4 out of 10 experts were skeptical.

However, if one considers the experts' statements regarding the importance of employee flexibility, the contradiction can be resolved: Automation yes, but not in order to become more independent of the human factor, but for reasons of increased efficiency. Particularly during the corona crisis, humans have proven to be an asset in supply chain management and operations that should not be replaced but deployed in the right places.


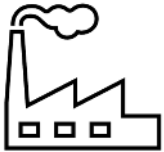
The high number of product variants provides a major stumbling block on the way to an agile and fast supply chain for many companies. On the one hand, many product variants help to open the last corners of a market; on the other hand, the diversity of variants leads to decreasing demand quantities and increasing fluctuations in demand. Against this background, it is not surprising that the group of experts who assume a reduction in variant diversity is twice as large as the group of those who expect a further increase, but almost half of those surveyed (45%) are convinced that nothing will change in the future.

Securing liquidity is of great importance. This has been emphasized by the experts already and it is confirmed again in the answers concerning changes in target criteria. In the long term, three quarters



of the experts believe that securing cash flow will become significantly (34%) or at least slightly (41%) more important. Almost nobody expects this target criterion to lose importance. Just under a quarter of the participants do not expect any long-term shift in importance.

#### First Recommendations for action (more to come):

	Shorten delivery times in procurement, production and distribution
	Use today's possibilities (digitalization) of capacity scheduling to utilize production capacities and still achieve short throughput times

