Germany Economic Viewpoint

Global value chains are cool

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China growth composition more important than its level

When global growth strengthens, Germany benefits a lot. Risks to our 2.3% growth forecast for 2018 are to the upside. But composition of growth in export markets matters. At a given quantum of global growth, the mix of strong Chinese capex and strong European consumption (which we had in 2017) is very good for the German manufacturing sector. The likely future mix, ie more Chinese consumption but less capex, and more European capex than consumption, the German manufacturing sector performance would be relatively less optimal for Germany. Put differently, composition of growth in China may matter more for Germany than its absolute level.

All things German improve when the world is doing ok

To come to this conclusion, we dissect World Input Output. In summary, we find that

- Around 70% of German manufacturing value-added (VA) is linked to foreign final demand (vs 20% of services value-added), relatively evenly split between capex and consumption.
- End-demand in US and China matters more than headline export shares suggest. US is the largest, China the second, and France the third-biggest end-market in value-added terms.
- Some manufacturing sectors rely almost entirely on foreign final demand (such as pharma, transport equipment other than cars, or computer, and electronics), and within that, a shift from consumption to capex-driven growth or from developed to emerging market-driven growth can matter.
- Sectors with high exposure to capex are more exposed to Asia, while sectors with high exposure to consumption are more exposed to Europe.

Refer to important disclosures on page 6 to 7.
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Why look at value-added rather than simple export shares?

Rather than looking at headline export growth, ie, the expenditure side of GDP, we look at value-added, ie, the production side of GDP. Why? Typically, exports contain a lot of imports (c 30%). What does this mean? When Germany exports a car worth EUR10,000, this car will contain many intermediate goods imported from Eastern Europe, for instance. Value-added in Germany, therefore, is typically only a fraction of that. Or from a different angle, a photo-camera lens produced in Germany may be exported to China, where it is assembled, and shipped to the US where it is actually sold.

World Input Output Tables provide details of the value added production chain across 56 sectors and 44 countries, and end-demand split in public and private consumption, capex and inventories (in a matrix of c 6.5mn data points every year). We predominantly focus on the latest available period (2014).

More than two-thirds of manufacturing value-added relies on foreign demand

In a first step, we check how much of German value-added is really linked to demand abroad. Results are shown in Chart 1. Around one-third of total value-added created in Germany is linked to foreign demand, up from just below 25% in 2000, versus lower and somewhat more stable shares of around 20% in other large Euro-area economies (note that the share of VA linked to foreign demand is not equivalent to the external surplus – German demand also relies on VA created abroad).

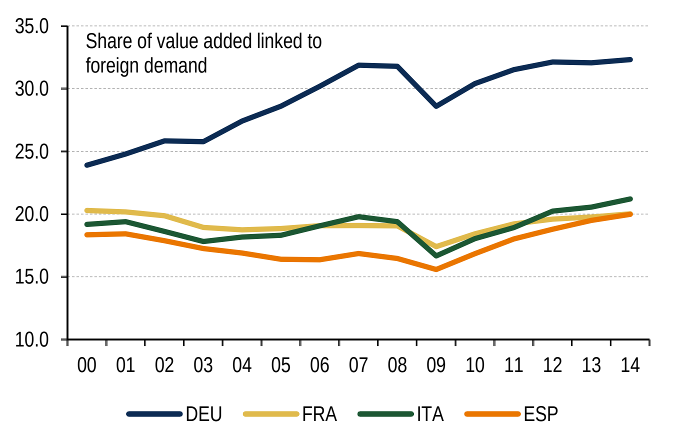
The bulk of this integration in the global economy concentrates in the manufacturing sector, where 70% of value-added in 2014 was actually linked to foreign final demand (Chart 2).

Final demand in US and China matters more than in France

Judging by headline export share, France has long been Germany's biggest single export market, although in 2015/16 the US took over by a small margin. But as we argued above, exports to France do not necessarily serve French final demand, but may, in parts, be used for products that are ultimately consumed elsewhere in the world (think about Airbus production for an Asian airline, for instance).

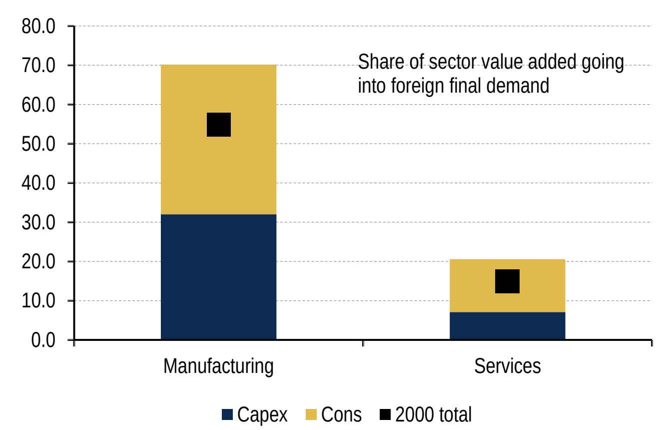
In value-added terms, the ranking of Germany's export markets reshuffles quite a bit, with the US clearly absorbing the largest share of German value-added linked to foreign demand (c10% equivalent to 3.4% of total German value-added), ahead of China (8.6%) and France in third (Chart 3). This matters for growth prospects: If Chinese or US demand increases, Germany ultimately benefits more than if French demand improves to the same extent. Although not focus of this note, we show a more complete matrix in Table 1, including the share of value-added linked to foreign final demand in Germany,

Chart 1: A third of German value added is linked to foreign demand



Source: WIOT, BofA Merrill Lynch Global Research

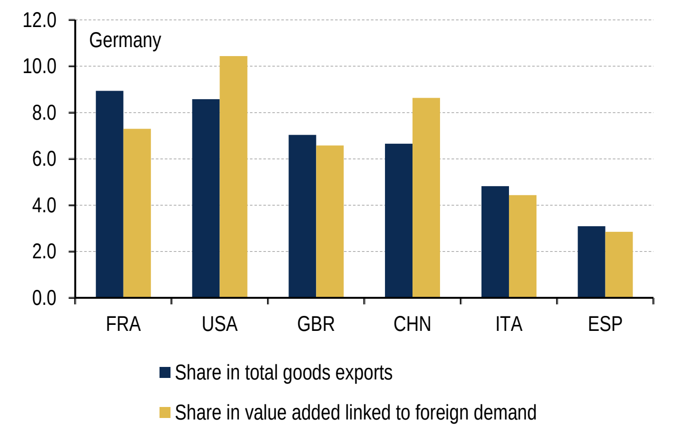
Chart 2: A "global" German manufacturing sector



Source: WIOT, BofA Merrill Lynch Global Research

UK, US and China (last column) broken down by individual regions/countries. The data suggest that relatively speaking, what happens in final demand in China may matter a lot more for German value-added than vice versa.

Chart 3: Trade partner "ranking" reshuffled



Source: Destatis, WIOT, BofA Merrill Lynch Global Research

Table 1: Domestic value added shares linked to foreign final demand

	Total	by 'final demand' origin						
		DEU	EMU_Big4	EMU	UK	China	US	ROW
Germany*	37.0		4.7	13.2	2.1	2.8	3.4	15.5
UK	21.4	1.4	3.7	5.9	-	1.1	2.9	11.5
US	8.9	0.4	0.9	1.4	0.4	0.7	-	6.4
China	18.7	0.7	1.5	2.1	0.5	-	3.1	13.0

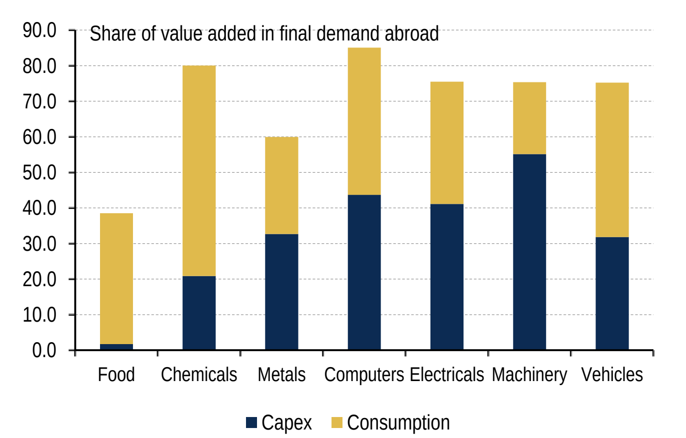
Source: BofA Merrill Lynch Global Research

*: from a German perspective, EMU Big 4 are Big 3, ie France, Italy, Spain

Not all sectors are alike

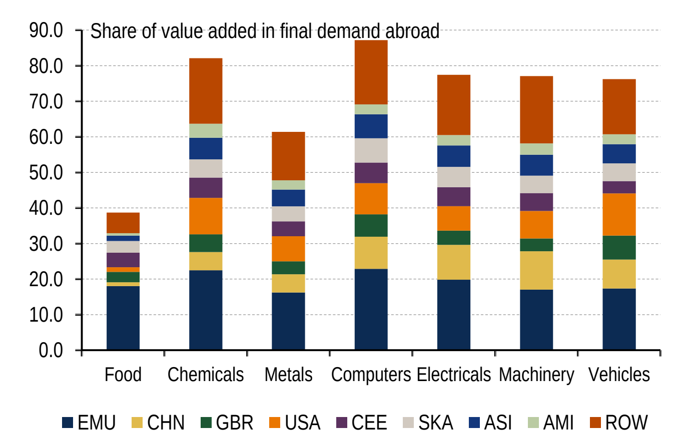
We see in Chart 2 that the manufacturing sector depends heavily on foreign demand, to serve final consumption and capex demand abroad to a similar extent (which is surprising given the smaller proportion capex generally represents in GDP expenditure versus consumption). This balance is not the case for all sub-sectors within manufacturing. Some sectors, such as chemicals or vehicle production, depend more on consumption, while machinery equipment growth responds more to a revival of the global capex cycle (we show details for the sectors accounting for a min 5% of German manufacturing VA in Chart 4).

Chart 4: Germany's biggest manufacturing sub-sectors and their exposure to capex or consumption abroad



Source: BofA Merrill Lynch Global Research

Chart 5: Germany's biggest manufacturing sub-sectors and their exposure to final demand across regions



Source: BofA Merrill Lynch Global Research

Regions: EMU=Euro area excl Germany, CEE= BGR, CZE, HRV,HUN, POL, ROU, SKA=CHE,DNK, NOR, SWE, ASI=AUS, IDN, IND, JPN, KOR, TWN, ROW=RUS,TUR, rest of the world

We think the question will be whether some sectors show particular exposure to regions and whether they are exposed to capex or consumption developments? This is a lot of information to take in. Complementary to the sector-exposure to capex or consumption demand abroad in Chart 4, we show the breakdown of value-added linked to foreign demand by country/region in Chart 5. Across most sectors, the Euro area is the most important region for foreign demand. But relatively speaking, the Euro area is more important in sectors that have higher exposure to consumption than capex.

Squaring the information of Chart 4 and Chart 5 becomes a large matrix, which we attempt to summarise in the form of heat-maps. In Table 2, we colour-code the exposure of 19 manufacturing sectors in Germany by region and by capex vs consumption exposure to each of these regions (codes are listed in Table 3). How to interpret this? We focus on the upper panel "Capex": In column 2, we show the share of manufacturing value to serve foreign demand, irrespective of exposure to foreign capex or foreign consumption (all regions sum up to 100%). Column 3 indicates if the sector is more exposed to capex (green) or less exposed to capex (orange) compared with the average share in manufacturing value-added. Subsequent columns (labelled C10-C33) follow the same rationale across individual sectors.

Clients focused on stock performances across sectors may find the sector details useful. We flag the main points. German manufacturers seem to be more exposed to the Chinese (and broader Asian) capex than consumption cycle, while the reverse is true for European markets (incl the UK). Consequently, as Chinese growth adjusts to more consumption but less investment would not be optimal for the German economy. Meanwhile, in Europe, a strong capex recovery would obviously boost demand for German manufacturing produce a lot. But relatively speaking, a strong consumption performance could keep the manufacturing sector afloat. From this perspective, the 2017 growth mix in Europe and China has been very good for German manufacturers, reflecting in the acceleration in growth dynamics.

Table 2: Heatmap: regional and capex vs consumption exposure of German manufacturing sectors

CAPEX

	Share of manufacturing VA per region	Capex vs total	C10-C12	C13-C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30	C31-C32	C33
		Expenditure component by sector vs total																			
EMU	*26.9*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CHN	*9.3*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GBR	*6.8*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
USA	*11.0*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CEE	*6.4*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SKA	*6.7*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ASI	*7.0*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AMI	*3.9*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ROW	*22.0*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CONSUMPTION

	Share of manufacturing VA per region	Cons vs total	C10-C12	C13-C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30	C31-C32	C33
		Expenditure component by sector vs total																			
EMU	*26.9*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CHN	*9.3*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GBR	*6.8*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
USA	*11.0*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CEE	*6.4*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SKA	*6.7*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ASI	*7.0*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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ROW	*22.0*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Colour codes: we calculate the standard deviation of trade shares across sectors for each export partner. Dark green means value added exposure more than 1 standard deviation above the average exposure to the region. Lighter green is half a standard deviation.

Table 3: Manufacturing sector codes

Sector code	Description	% manufacturing VA	% of VA for foreign final demand
C10-C12	Manufacture of food products, beverages and tobacco products	6.9	38.7
C13-C15	Manufacture of textiles, wearing apparel and leather products	1.3	91.6
C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	1.1	44.5
C17	Manufacture of paper and paper products	1.8	71.5
C18	Printing and reproduction of recorded media	1.3	37.1
C19	Manufacture of coke and refined petroleum products	0.6	44.5
C20	Manufacture of chemicals and chemical products	7.1	82.1
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	4.0	83.7
C22	Manufacture of rubber and plastic products	4.5	71.2
C23	Manufacture of other non-metallic mineral products	2.8	45.9
C24	Manufacture of basic metals	3.5	77.5
C25	Manufacture of fabricated metal products, except machinery and equipment	8.8	61.4
C26	Manufacture of computer, electronic and optical products	5.7	87.2
C27	Manufacture of electrical equipment	7.3	77.5
C28	Manufacture of machinery and equipment n.e.c.	15.5	77.1
C29	Manufacture of motor vehicles, trailers and semi-trailers	19.1	76.2
C30	Manufacture of other transport equipment*	2.3	99.5
C31_C32	Manufacture of furniture; other manufacturing	3.9	65.9
C33	Repair and installation of machinery and equipment	2.6	42.4

Source: BofA Merrill Lynch Global Research

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