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IDEA FEDERATION NEWSLETTER

COULD THIS REPORT MARK THE END OF RAMPANT GLOBALISATION...?

ADAM FLETCHER, ECSN

Commissioned by Joe Biden shortly after his inauguration the Report that the US Department of Commerce (DoC) published at the end of June revealed much to concern the new President: It examined threats from cyber-attack, climate shock. extreme weather events, terrorist attack pandemics and economic competition. The section on technology manufacture and innovation makes interesting reading for everyone involved with the electronic components supply network in the US and in Europe. In this article Adam Fletcher, Chairman of the IDEA reviews some of the Report's key findings in the light of current electronic components supply problems and wonders if "rampant globalization" might be coming to an end?...

SCOPE OF THE REVIEW...

Snappily entitled *"Building Resilient Supply Chains, Revitalizing American Manufacturing and Fostering Broad Based Growth"* the Department of Commerce (DoC) authored Report was the culmination of a 100-day investigation into the key factors that could threaten the US's manufacturing capacity and the availability and integrity of critical goods, products, and services. In the technological sector the Report focused on supply chain issues in four critical US industries: Semiconductor Manufacturing & Advanced Packaging; Large Capacity Batteries; Critical Minerals & Materials and Pharmaceuticals & Active Pharmaceutical Ingredients (APIs). It's the first three sections of the Report that are of most interest to readers of *IDEA News* as they impact directly on global electronic components markets.

SEMICONDUCTOR MANUFACTURING AND ADVANCED PACKAGING...

I'm certain that President Biden is very concerned about the US share of global semiconductor production, which astonishingly has declined from 37% to a mere 12% in just ten years. Without a comprehensive governmental strategy, it's projected to decline even further. The DoC's analysis of the global semiconductor supply chain acknowledges that Taiwan, responsible for over 92% of leading-edge semiconductor production, has a seemingly unassailable lead in global semiconductor manufacture

SEPT/OCT 2021

ASSOCIATIONS

AREI - SOUTH AFRICA
Association of Representatives for Electronics Industry

ASPEC - RUSSIA
Association of Suppliers of Electronic Components

ASSODEL - ITALY
Associazione Nazionale Fornitori Elettronica

CEDA - CHINA
China Electronics Distributor Alliance

ECAANZ - AUSTRALIA
Electronic Components Association Australia and New Zealand

ECIA - UNITED STATES
Electronic Components Industry Association

ECSN - UNITED KINGDOM
Electronic Components Supply Network

ELCINA - INDIA
Electronic Industries Association of India

FBDI - GERMANY
Fachverband der Bauelemente Distribution

FEDELEC - TUNISIA
Tunisian Federation of Electric and Electronic Industries

SE - SWEDEN
Svensk Elektronik Trade Associations

SPDEI - FRANCE
Syndicat Professionnel de la Distribution en Electronique Industrielle

but notes that the country's government provides generous subsidies to manufacturers for fabrication facilities, providing 50% of the cost of the land and 45% of construction and infrastructure costs. South Korea and Singapore are almost as generous: They provide subsidies that reduce the cost of facilities ownership by 25%-to-30%. But seemingly the US has now received the wake-up call: In June '21 the Senate approved the *"US Innovation and Competition Act (USICA)"* bill, which earmarks $52bn for investment in US based semiconductor research, design and manufacturing,

US SHARE OF GLOBAL SEMICONDUCTOR PRODUCTION HAS DECLINED FROM 37% TO 12% IN JUST TEN YEARS."

and $29bn for investment in applied sciences, but House of Representatives approval is necessary before these measures can be signed into law.

ROBUST SUPPLY NETWORKS...

Recent events have demonstrated that even a small failure in a supply chain can have a devastating impact on individuals, organizations and a country's economy. Supply chain resilience (defined as the ability to speedily recover from an unexpected event) is essential for the maintenance of economic security and prosperity. For years the US private sector and public policy approach to domestic production has prioritized cost efficiency and return on investment over security, sustainability, and resilience, which has resulted in entire industries being 'hollowed out', precipitating the threats to supply chain security that the DoC investigation was looking for. The Department had earlier warned that

GLOBALISATION NEEDS A MAJOR OVERHAUL IF THE US IS TO REBUILD ITS IDENTITY AS A MANUFACTURER AND NOT MERELY AS A CONSUMER

"in the absence of the commercial volume the US will not be able to keep up with technology in terms of quality, cost or workforce", recognizing that a robust and resilient supply chain must include a diverse and healthy ecosystem of suppliers. It also recommended that additional effort be focussed on "rebuilding small and medium sized manufacturing operations and diversifying international suppliers to reduce the risk of geographic concentration". It's apparent that Globalization needs a major overhaul if the US is to rebuild its identity as a manufacturer and not merely as a consumer.

….. and Supply Chain Vulnerabilities...

The DoC Report identified four inter-related themes that contribute to US supply chain vulnerabilities:

Insufficient Manufacturing Capability **–** The loss of manufacturing capacity in the US – particularly in the small & medium sized entities (SME) sector has become a national malaise and has gone a long way to stifle the IP innovation that underpins the country's continuing progress in a wide range of products and technologies.

When production capacity moves offshore R&D and wider industrial supply chains inevitably follow. It's estimated that

S&P500 LISTED ORGANISATIONS DISTRIBUTED 91% OF THEIR NET INCOME TO SHAREHOLDERS

the US lost a third of all its manufacturing jobs between 2000 and 2010, with 25% of the losses directly attributed to China's increased commercial influence following its admittance into the World Trade Organization (WTO) in December 2021.

Misaligned Incentives and Short-termism in Private Markets – Current US market structures fail to reward organizations for investing in quality, sustainability, or long-term productivity. The Report found that between 2009 and 2018, S&P500 listed organisations distributed 91% of their net income to shareholders in the form of either stock buybacks or dividends. This focus on short-term capital returns has led to underinvestment by the private sector resulting in a declining share of corporate income available for R&D, new facilities, or resilient production processes.

Industrial Policies Adopted by Allies, Partner and Competitor Nations – The Report singles China out for particular criticism concerning aggressive and unethical trading practices that it ruthlessly applies to stimulate its domestic production and capture global market share. These practices include widespread public investment

in R&D, domestic demand incentives and strategic international partnerships. Other nations have adopted more legitimate industrial policies to ensure resilience and competitiveness including scouring the world for lower-cost production centers, measures that have led to a concentration of supply in a few geographic locations, which further increases supply chain vulnerability.

Critical Minerals and Materials and Large Capacity Batteries...

Climate warming is driving the demand for the rare earth metals necessary to manufacture low-carbon technologies. According to figures from the US Department of Energy currently China has control of 55% of global rare earths mining and 85% of rare earths refining capacity, including 60% of the world's lithium and 80% of its cobalt, two of the primary inputs to high-capacity battery manufacture. China also has over 75% of the world's fabrication capacity for advanced battery cell production.

These figures should be disturbing the President's sleep as they reveal an alarming threat to the future of EV manufacturing and sales in the US and other nations. It's good news that US production capability for large capacity batteries is expected to increase to 224GWh by 2025, but that's still well below what the country needs to service its projected demand for Electric Vehicles (EVs).

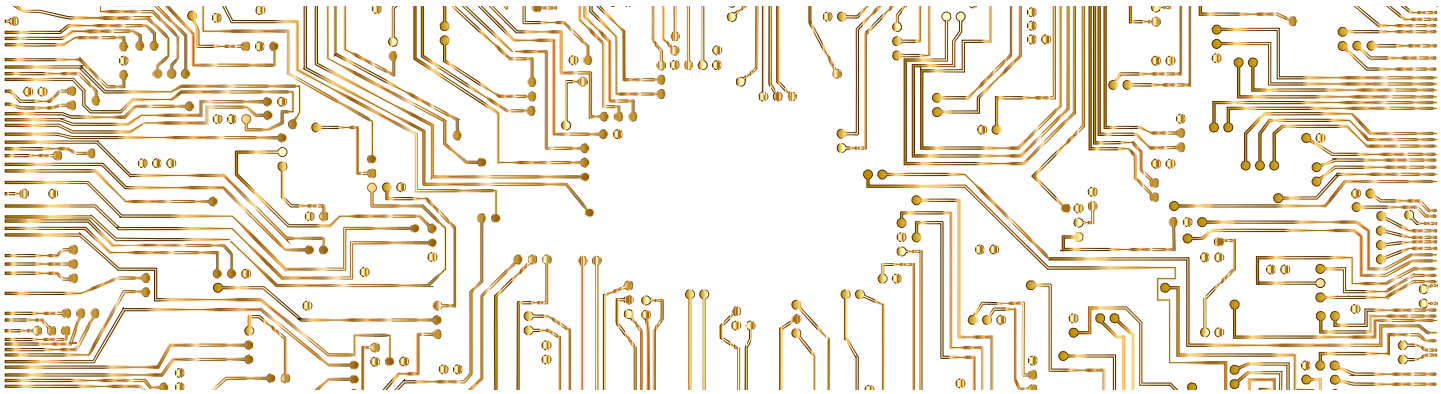
Limited International Coordination **–** Finally, the DoC Report accuses the US government of chronic under-investment in the international diplomatic efforts necessary to develop collective approaches to supply chain security, but in that the United States is by no means a country all out on its own!

CONCLUDING THOUGHTS...

In the 1990s the European governments enthusiastically asserted that the region was "moving up the value chain" and actively encouraged moving domestic manufacturing offshore, primarily to the Far East. Interestingly, EU economies were impacted by the move to offshore manufacturing to Asia-Pac at least ten years before the US woke up and smelt the coffee. During the 1980/90s the US migrated significant manufacturing capacity to Mexico in search of lower costs, and only much later sent production across the Pacific to Asia-Pac countries in search of ever more cost savings. I'm encouraged to learn that several companies are in talks with UK and European authorities about investment in "gigafactories" to build large capacity batteries for electric vehicles. When (if?) these facilities are built they will still be highly reliant on China for the supply of lithium and cobalt needed in production.

WHEN (IF?) THESE FACILITIES ARE BUILT THEY WILL STILL BE HIGHLY RELIANT ON CHINA

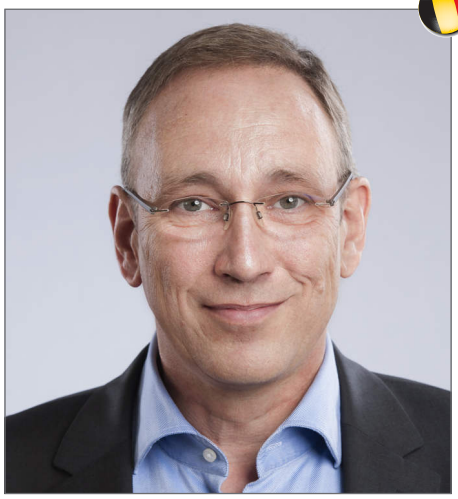
It will be interesting to see how far the Western economies become "managed" or "directed" by governmental policy over the next few years. The need for increased geographic diversity in their supply chain mandates increased government involvement, which in turn suggests that the era of "rampant globalisation" might be coming to an end. Can we look forward to regional or national adoption of a more 'joined up' manufacturing policy? I hope so, but I'm not holding my breath. The progress of UK (and European) government decision-making is painfully slow and there is likely to be a lot more change happening in the intervening decades, which is certain to deflect or re-direct progress.



German components distribution achieves double-digit growth with significant surge in demand

German components distribution (according to FBDi e.V.) reports a 17.5% increase in sales and an increase in bookings of 132% in the second quarter of 2021. Components shortage is preventing a better result.

ANDREAS FALKE, FBDI



The first consequences of the component shortage became visible in the second quarter of the year. The distributors registered in the FBDi association recorded a 17.5% increase in sales to 802 million Euros from April to June 2021. In the same period, bookings virtually exploded, reaching two new records with 132% growth and a total volume of 1.43 billion Euros. As in Q1, the lack of availability slowed down sales growth considerably. The book-to-bill rate rose again, to an incredible 1.79.

BOOKINGS VIRTUALLY EXPLODED, REACHING TWO NEW RECORDS WITH 132% GROWTH

At product level, Passive Components grew significantly by 35% to 104 million Euros, as did Electromechanical by 31% to 112 million Euros. Semiconductors, the strongest product group, "only" grew by 11.2% to 520 million Euros, but had a massive increase in bookings to over 1 billion Euros. Electromechanical sensors grew by 54%, displays by 3.9%, power supplies by 28.2% and assemblies and devices by 43.3%. The distribution of sales shows slight shifts: Semiconductors take 65% of sales, passives 13%, electromechanics 14%, power supplies 4%, and the remaining 4% are distributed among the other products.

FBDi Chairman of the Board Georg Steinberger said: "In view of the absurdly high order situation, it can be assumed that the increase in sales was characterized more by a lack of availability and price increases than by real growth, which will hopefully materialise in the coming quarters.

How much of the almost 1.5 billion euros in new orders is real will become clear next year at the latest, because a large proportion of these orders are long-term advance bookings by many customers who want to avoid a situation like now."

INCREASE IN SALES WAS CHARACTERIZED MORE BY A LACK OF AVAILABILITY THAN BY REAL GROWTH

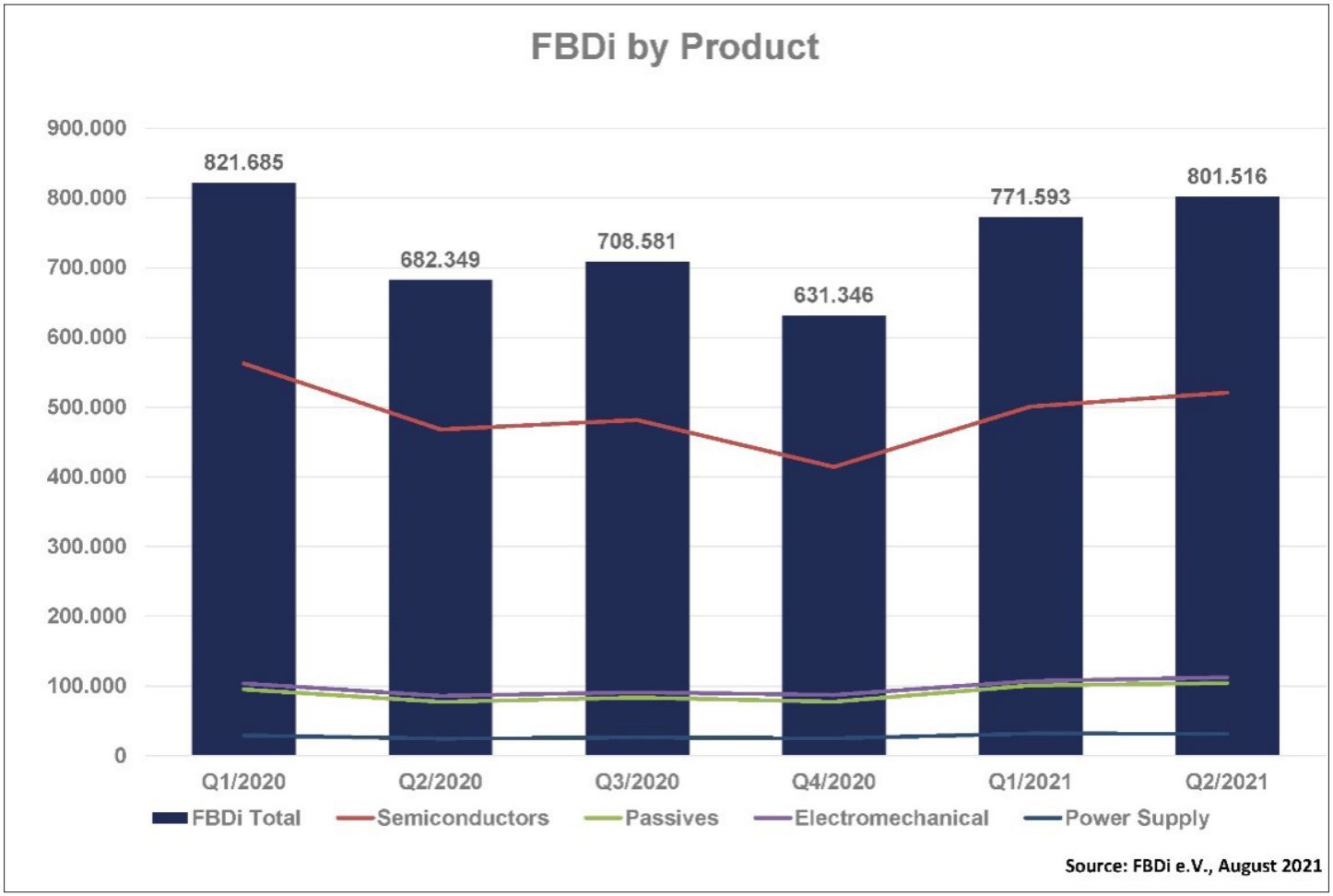
Interestingly, the discussion about billions in subsidies for 5-nm chip factories has calmed down again somewhat, according to Steinberger:

"We assume that work is continuing in secret the politicians to distribute billions in tax reliefs, but the differentiation of the discussion has already begun. After all, the European problem cannot be measured in nanometers, but in the lack of interesting chip designs suitable for mass production in the style of smartphone or tablet processors.

THERE ARE HARDLY ANY SIGNIFICANT RESEARCH AND EDUCATIONAL STRUCTURES FOR MICROELECTRONICS

And this is due to the fact that, compared to the USA, China and Japan, there are hardly any significant research and educational structures for microelectronics in this country, and just as little investment and support landscape for chip start-ups.

As long as subsidies always trickle down to large companies to finance things they do anyway, this will not change."



Q2 2021: Sales start to recover – Orders continue to surge.

AUBREY DUNFORD, IDEA

The second quarter of 2021 was very much a continuation of the first quarter as the world continued to fight the COVID 19 virus, and the global economic recovery continued. The large upswing in global demand continues to be lengthening lead-times on many electronic components. This surge in orders continues. This build-up of orders has led to only a modest increase in sales.

After the increase in the first quarter of 2021, the European Electronic Components Distribution Market continued its recovery in the second quarter as shown by the Q2 2021 European Electronic Components Statistics. Billings are historically higher in the first quarter of each year than in the second.
However measured across Europe billings in the second quarter of 2021 were 3.9% higher than in the first quarter of 2021 and were 22% higher when compared to Q2 2021.

BOOKINGS ACROSS EUROPE WERE 141% HIGHER THAN IN Q2 2020

The dramatic change between Q2 2020 and Q2 2021 can be seen in the bookings where total bookings across Europe were 12.5% higher than in Q1 2021 and 141% higher than in Q2 2020 with a very consistent pattern in across all countries. As can be seen in Graphic T1.

The book:bill ratio having fallen for 7 successive quarters improved in the last quarter of 2019 and rose past unity in the first quarter of 2020 to 1.05.
The effect of the COVID 19 pandemic drove the book:bill ratio down in the middle quarters of 2020 before rocketing up to 1.22 in Q4 2020 and rising to a 1.73 in the second quarter of 2021.

As has been widely reported there are now extreme shortages in the supply chain for many electronic components and thus with lengthening lead-times and suppliers looking for longer term order cover the book:bill ratio has continued to be severely inflated.

FAULT LINES WIDEN IN THE GLOBAL RECOVERY.

According to the International Monetary Fund's World Economic Outlook (WEO) published in July 2021 – "The global economy is projected to grow 6.0 percent in 2021 and 4.9 percent in 2022. The 2021 global forecast is unchanged from the April 2021 WEO, but with offsetting revisions. Prospects for emerging market and developing economies have been marked down for 2021, especially for Emerging Asia. By contrast, the forecast for advanced economies is revised up. These revisions reflect pandemic developments and changes in policy support. The 0.5 percentage-point upgrade for 2022 derives largely from the forecast upgrade for advanced economies, particularly the United States, reflecting the anticipated legislation of additional fiscal support in the second half of 2021 and improved health metrics more broadly across the group.
The pandemic has taken a turn for the worse in some parts of the world since the release of
the April 2021 WEO. Meanwhile, a speedy vaccine rollout has helped bring down caseloads quickly in other regions. Economies are diverging even further, influenced by differences in the pace of vaccine rollout and policy support. However, smooth and durable recoveries are not assured even in places where infections are seemingly under control.
Close to 40 percent of the population

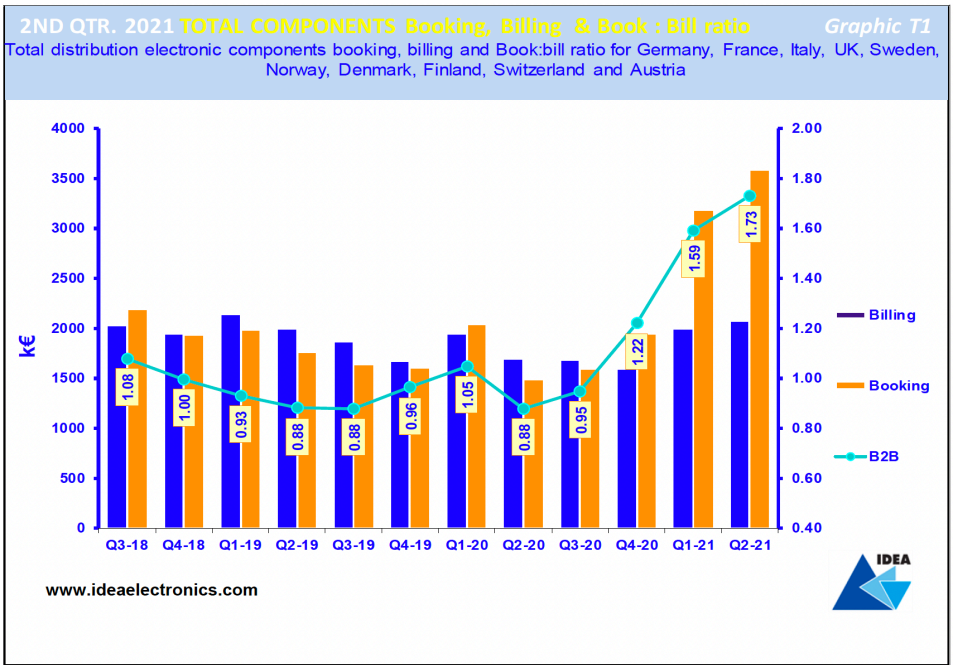
in advanced economies has been fully vaccinated, compared with less than half that number in emerging market economies and a tiny fraction in low-income countries. Vaccine access is the principal fault line along which the global recovery splits into two blocs: those that can look forward to further normalization of activity later this year (almost all advanced economies) and those that will still contend with prospects of resurgent infections and rising COVID death tolls. Sub-Saharan Africa is now in the grip of a third wave, parts of Latin America continue to see high levels of new deaths and concerns still remain about the situation in parts of South and Southeast Asia.
First-quarter GDP outturns overall surprised on the upside, notably in Asia and Latin America, while renewed lockdowns in Europe led to downside surprises. High-frequency data in the second quarter indicate the recovery is widening beyond manufacturing to services, especially in economies where infections are under better control.

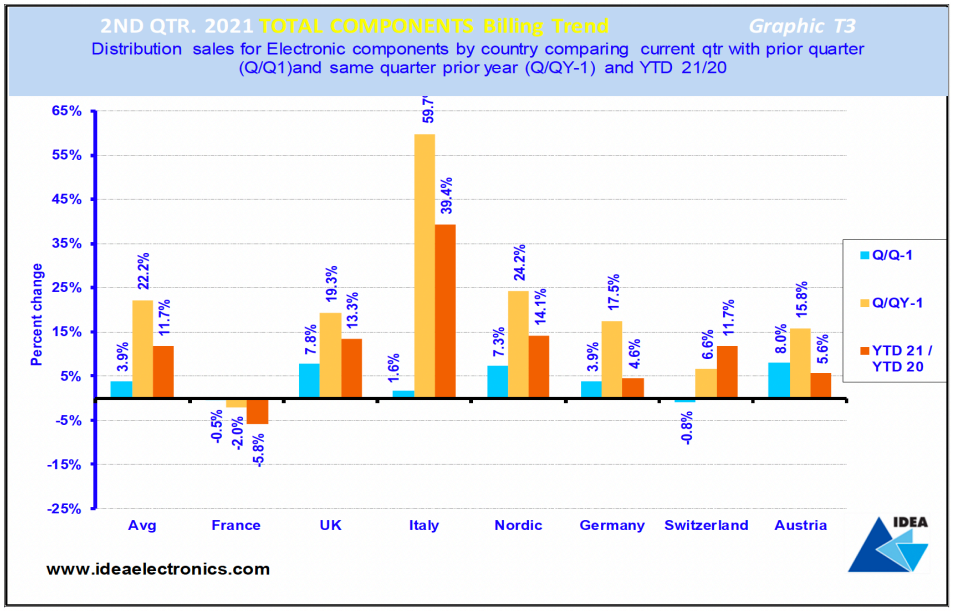
ECONOMIES ARE DIVERGING EVEN FURTHER, INFLUENCED BY DIFFERENCES IN THE PACE OF VACCINE ROLLOUT

New variants: Steady recovery is not assured anywhere so long as segments of the population remain susceptible to the virus and its mutations. Recovery has been set back severely in countries that experienced renewed waves—notably India. The United Kingdom
has had to delay the final step of its economic reopening because of the spread of the delta variant, even as the vaccine rollout had helped bring down hospitalizations.
China's Guangdong province imposed mobility restrictions in May following an outbreak after months of minimal new infections. Similarly, Australia reintroduced targeted lockdowns in June.
Aftershocks: The unprecedented convulsion in the global economy last year continues to trigger aftershocks that weigh on the recovery in some parts of the world. Empty shipping containers have been stranded in less frequented ports alongside shortages on busier routes, contributing to increased delivery times for inputs reported in purchasing managers' surveys.
These likely transitory shortages have occurred amid shifting spending patterns, for instance toward housing and work-from-home electronics. Consistent with pandemic-induced rising demand for owner-occupied housing (possibly supported in some cases by generally low mortgage rates), house prices have risen more in places with lower pre-pandemic home ownership rates. These shifting spending patterns and supply disruptions have generated shortages of components, such as microchips, creating bottlenecks for example in the automotive sector.
Inflation pressure: The current spikes in annual inflation in part are the result of mechanical base effects from last year's low commodity prices. Moreover, prices have increased because of the likely transient supply-demand mismatches discussed above—container freight indices for example have risen significantly since mid-2020. Amid these challenges, financial conditions have remained generally supportive. Financial market sentiment has remained positive on balance given the expected global recovery. The overall picture from the most recent WEO has not changed materially despite a recent bout of volatility: buoyant equity markets, tight credit spreads, and healthy flows into emerging market hard currency funds. This constellation of asset prices continues to provide a generally positive lift to the baseline global outlook".

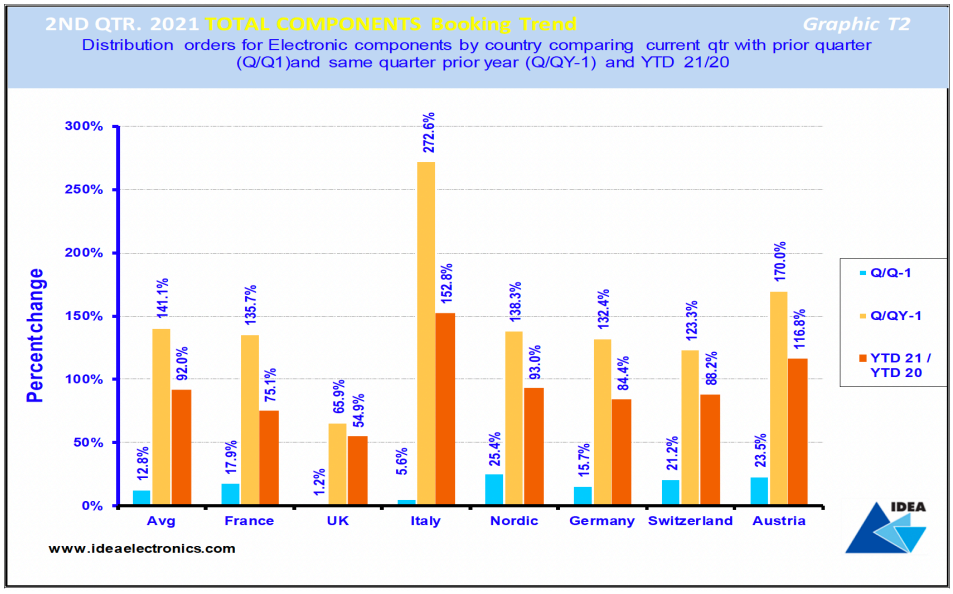
IRELAND RECORDED THE SHARPEST INCREASE OF GDP COMPARED TO THE PREVIOUS QUARTER."

China's economy continues to recover from the COVID-19 pandemic but growth is uneven, according to newly





released economic data covering the first half of 2021. In July, 2021, the National Bureau of Statistics announced that China's GDP grew by 7.9 percent in the second quarter of the year, compared to the same period the previous year.
Overall, China's GDP increased by 12.7 percent through the first half of 2021, putting the country on track to meet its growth target of "over 6 percent". Last year, China's economy grew by 2.3 percent, making it one of the few major economies to register positive growth amid the pandemic. China carried this momentum through the first half of 2021, but internal and external challenges will require the government to respond with policy solutions to sustain growth through the rest of the year.
Second quarter growth was down from the rapid 18.3 percent growth in the first quarter, which reflected the low base caused by the COVID-19-related disruption in early 2020.
Japan's economy rebounded more than expected in the second quarter after slumping in the first three months of this year. Data showed that consumption and capital expenditure were recovering from the coronavirus pandemic's initial hit. But



many analysts expect growth to remain modest in the current quarter as state of emergency curbs reimposed to combat a spike in infections weigh on household spending.
The world's third-largest economy grew an annualised 1.3% in April-June after a revised 3.7% slump in the first quarter, according to the preliminary gross domestic product (GDP) data, beating a median market forecast for a 0.7% gain. Still, the rebound was much weaker than that of other advanced economies, highlighting the fallout from Tokyo's struggle in containing the pandemic.

GDP in the USA increased at an annual rate of 6.6 percent in the second quarter of 2021 (table 1), according to the "second" estimate released by the Bureau of Economic Analysis. In the first quarter, real GDP increased 6.3 percent. The increase in second quarter GDP reflected the continued economic recovery, reopening of establishments, and continued government response related to the COVID-19 pandemic.
In the second quarter, government assistance payments in the form of loans to businesses and grants to state and local governments increased, while social benefits to households, such as the direct economic impact payments, declined.
The full economic effects of the COVID-19 pandemic cannot be quantified in the GDP estimate for the second quarter because the impacts are generally embedded in source data and cannot be separately identified.
In the second quarter of 2021, seasonally adjusted GDP increased by 2.2% in the euro area and by 2.1% in the EU compared with the previous quarter, according to an estimate published by Eurostat, the statistical office of the European Union.

In the first quarter of 2021, GDP had declined by 0.3% in the euro area and 0.1% in the EU. But the situation varies from country to country. Ireland recorded the sharpest increase of GDP compared to the previous

quarter (+6.3 per cent), followed by Portugal (+4.9 per cent). Declines were observed in Malta (-0.5 per cent) and Croatia (-0.2 per cent). Government spending also boosted growth, through stimulus packages and health measures to fight the COVID-19 pandemic.
UK gross domestic product grew by 4.8 percent on quarter in April to June 2021, recovering from a 1.6 percent contraction in the previous three-month period, as activity and demand rebounded following the easing of coronavirus restrictions. Household consumption jumped 7.3 percent (vs -4.6 percent in Q1) and public spending advanced 6.1 percent (vs 1.5 percent in Q1).
In output terms, the largest contributors to this increase were from wholesale and retail trade, accommodation and food service activities, and education. The level of GDP remained 4.4 percent below pre-pandemic levels.
Looking at the data from the Q2 2021 European Electronic Components Statistics we can see:

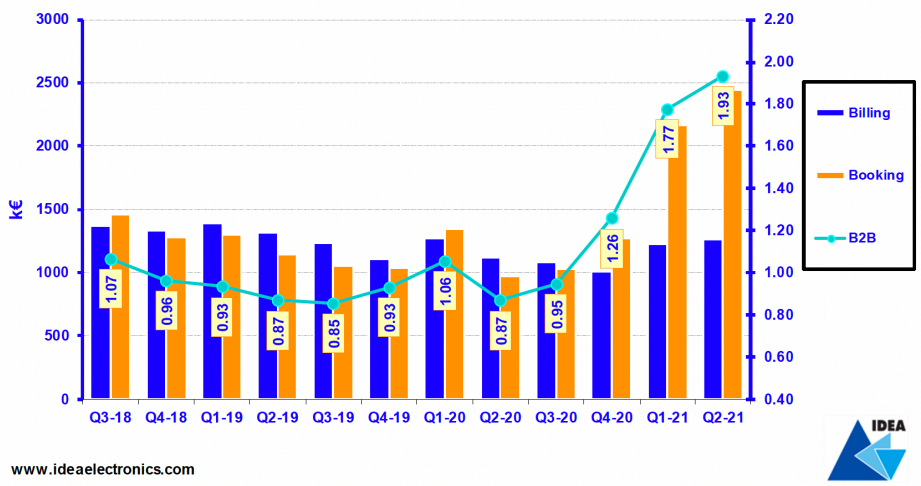
BILLINGS START TO INCREASE BUT BOOKINGS CONTINUE TO GO WILD.

As can be seen in Graphic T3 there was an increase in billings (sales) Q2 2021 over Q1 2021 in nearly all countries with minor falls in France and Switzerland, so for Europe as a whole, the increase was 3.9%, but compared with the second quarter of 2020 when shutdowns were at their peak there was an overall increase in sales of 22.2%. Europe's largest market, Germany, increased by 17.5% and Italy by nearly 60%. Apart from France, all other countries showed a increase compared to Q2 2020.

The figures shown in Graphic T2 show that bookings in Q2 2021 were overall 12.8% higher than Q1 2021 and 141% higher than in Q2 2020. There was an increase in all countries but Italy showed a Booking level of nearly three times of a year earlier when Italy was in the middle of the first wave of the pandemic.

2ND QTR. 2021 SEMICONDUCTOR bookings, billings & book:bill ratio *Graphic S1*

Semiconductor components bookings, billings & book:bill ratio for Germany, France, Italy, UK, Sweden, Norway, Denmark, Finland, Switzerland and Austria



QUARTERLY SALES BY PRODUCT FAMILY

As we do each quarter, we look at the booking and billing trends by product and regional market.

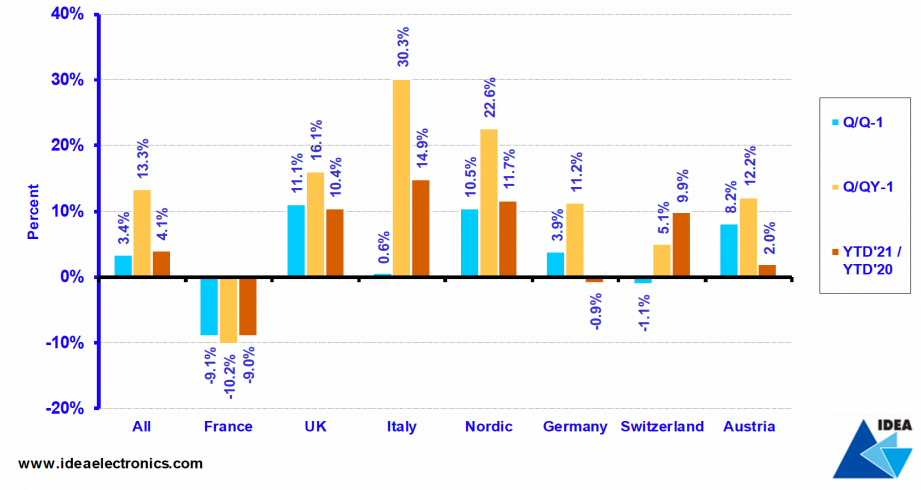
SEMICONDUCTORS

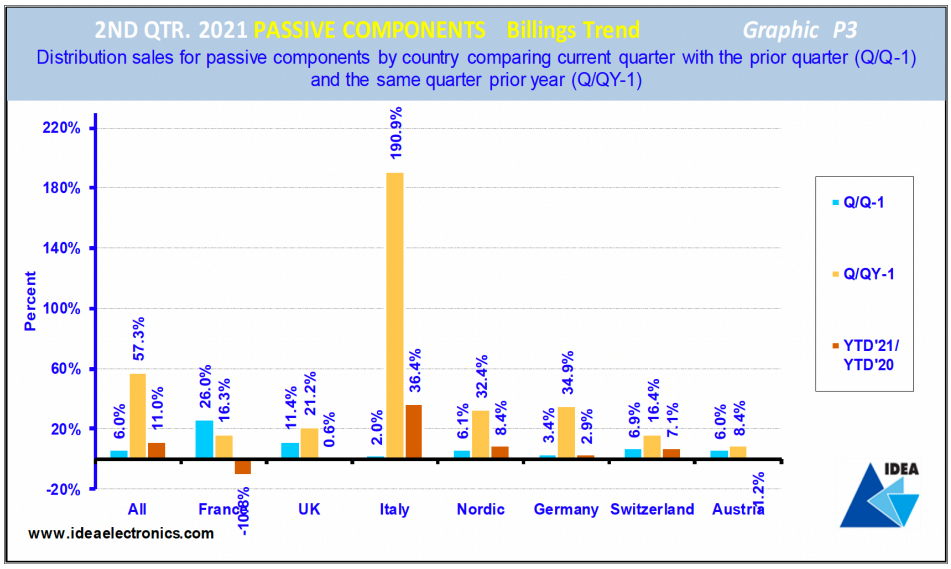
The book:bill ratio for semiconductors as shown in Graphic S1 shows the same pattern as for the total components with 6 quarters with the ratio declining but then increasing in the fourth quarter of 2019, in the first quarter of 2020 passing back into positive at 1.05 before dropping down to 0.87 in the second quarter before recovering.

In the last quarter of 2020 the ratio rocketed to 1.26 and in Q2 2021 has hit 1.93.
This picture within the semiconductor market in Europe continues to be consistent with figures from other sources showing that as product shortages and lengthening lead-times, customers are booking orders in order to secure product. With product lead times extended, prices increasing and customers looking to secure stocks it is difficult to estimate the actual increase in the underlying demand.
As can be seen in Graphic S3 Billings in Q2 2021 were 3.4% higher than in

2ND QTR 2021 SEMICONDUCTOR Billing Trend *Graphic S3*

Distribution sales for semiconductors by country compared with the prior quarter (Q/Q1) and the same quarter prior year (Q/QY-1) and YTD 21/20





Q1 2021 but 13.3% higher compared with Q2 2020. Billings for the first half of 2021 compared to H1 2020 were lower in Germany and France. For Europe as a whole the increase was only 4% showing that the recovery still has some way to go to restore the market to pre-pandemic levels.

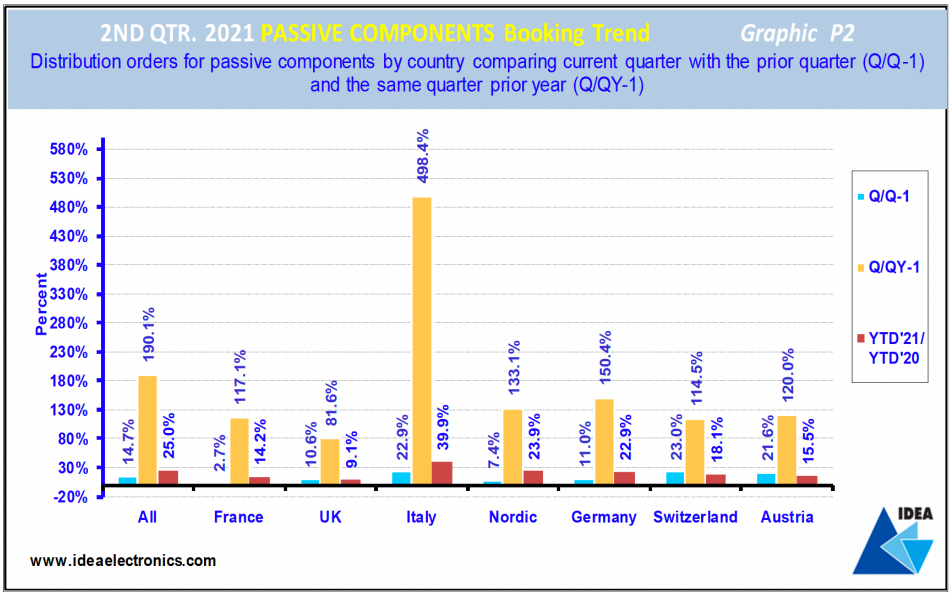
PASSIVES

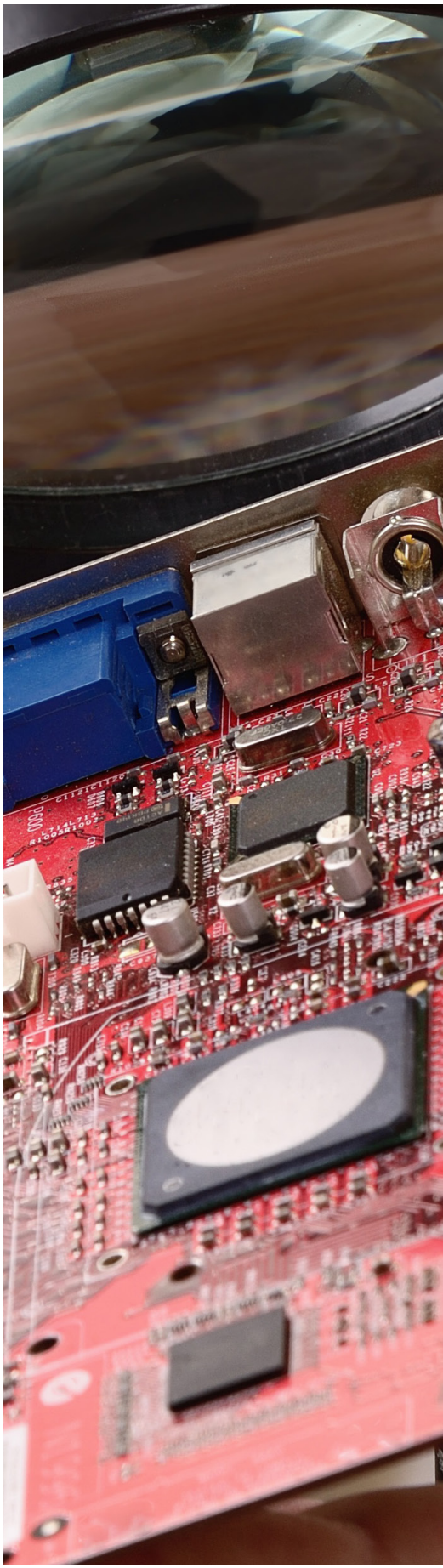
In the Passives Sector the book:bill ratio dropped below unity at the start of 2019 but then rebounded nearly to unity in the last quarter of 2019 and having improved slightly in Q1 2020 passing back past unity, dropped back to 0.83 in the second quarter, before increasing to 1.21 in Q4 2020 and 1.54 in Q2 2021.

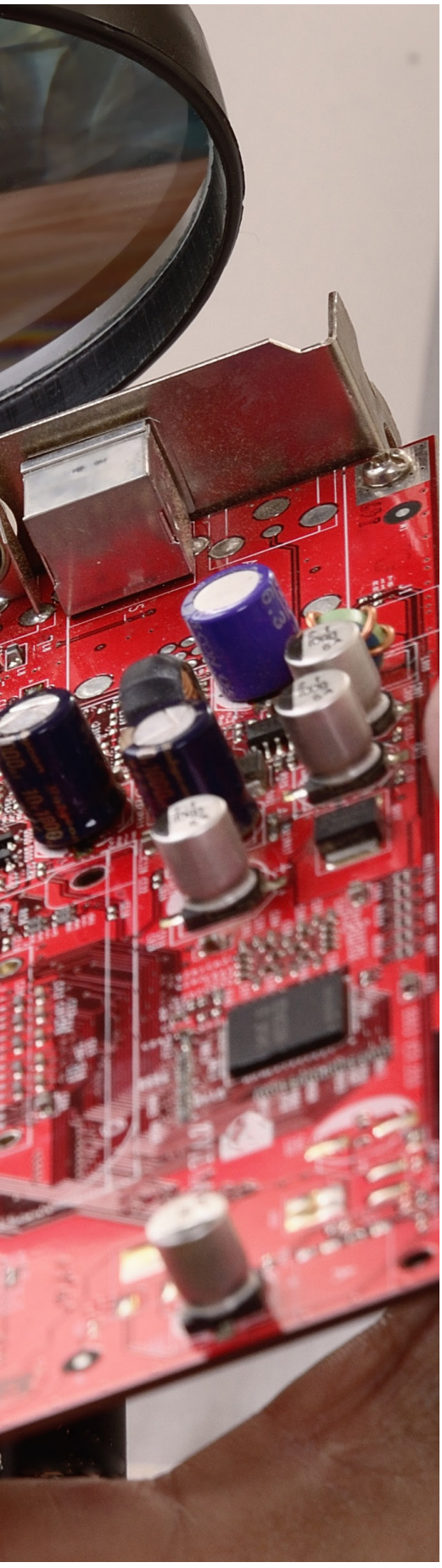
As can be seen from Graphic P3 passives is showing the same general picture as semiconductors with sales in Q2 2021, 6% higher than in Q1 2021 but over 50% higher than in Q2 2020. Billings in the first half of 2021 are 11% higher than in the first half of 2020.

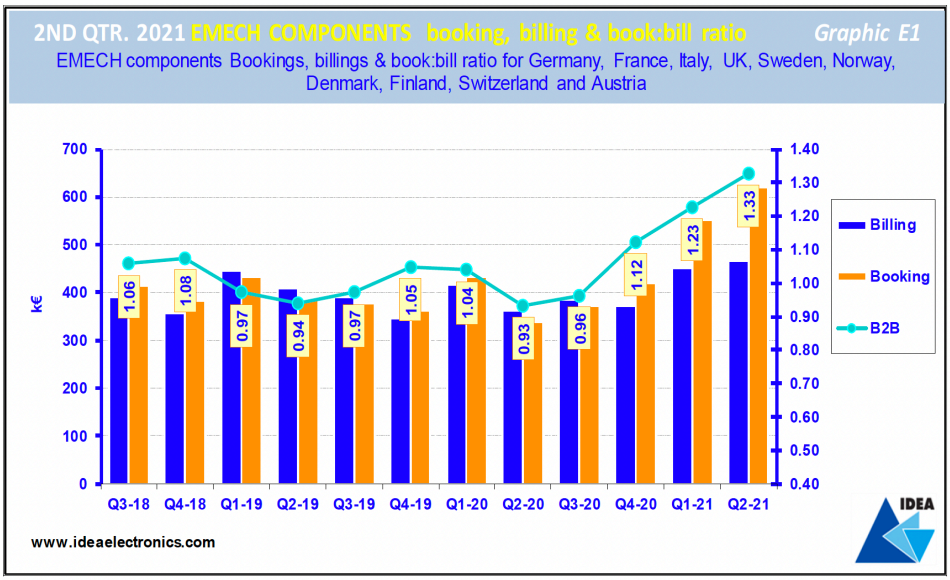
There is a similar picture across the European countries with the exception of Italy where sales in Q2 2021 were almost double than in Q2 2020.

As shown in Graphic P2 there has been strong bookings in all countries with bookings overall in Q2 2021 were 14.7% higher than in the first









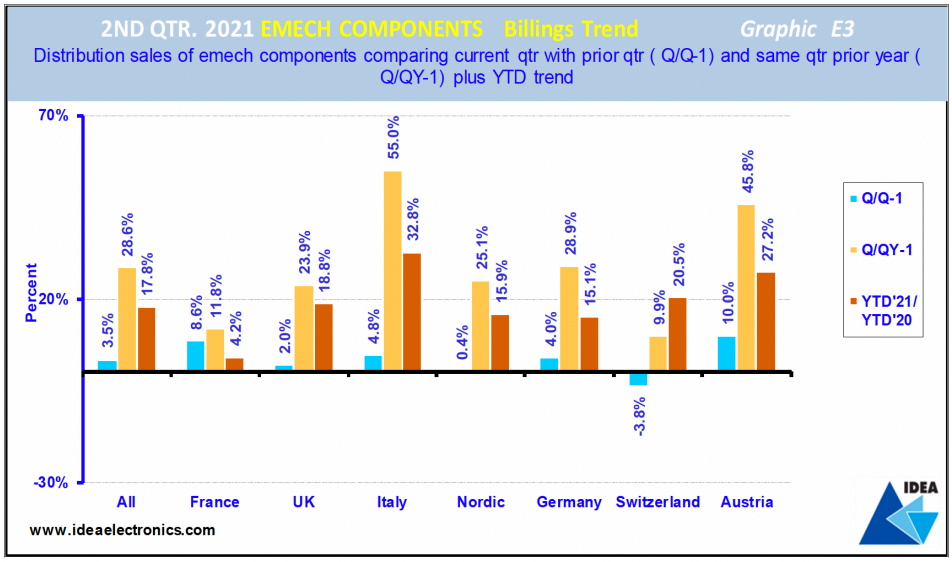
quarter of 2021 and almost double the bookings in the second quarter of 2010. Again, Italy is an exception with bookings nearly five times the level in Q2 2020.

> ITALY IS AN EXCEPTION WITH BOOKINGS NEARLY FIVE TIMES THE LEVEL IN Q2 2020."

E-MECH AND OTHER COMPONENTS

As can be seen from the graphic E1 the trend for the book:bill ratio is more stable than the other two product categories but still shows the same basic pattern including the upswing in the past two quarters. The ratio was around unity until the third quarter of 2020 but then increased to 1.12 in Q4 2020, 1.23 in Q1 2021 and 1.33 in Q2 2021.

Graphic E3 shows that overall, there was an increase of 3.5% in billings in the second quarter of 2021 compared to the first quarter of 2021 and a 28.6% increase over the second quarter of 2020 and there was a similar picture across the different countries, although billings in Italy were over 50% higher than in Q2 2020. Total Bookings for H1 2021 were 52.3% higher than in H1 2020 and 83.5% higher than in Q2 2020.



Sustainability / Supply Chain
We need a new moon landing!

GEORG STEINBERGER,
Chairman of the Board, FBDi association

Georg Steinberger, Chairman of the board of FBDi, ponders chip shortage, smart cities, climate protection & innovation and how Europe can position itself in global competition: “Human innovative power will pulling us out of the swamp Munchausen-style? Not going to happen.”

Do you feel that as well? Something has started to move in the last year and a half. A new spirit of awakening: Something has to change, both personally and socially. Whether these changes will also manifest themselves positively in economic terms remains to be seen - it’s up to us.

The hopefully subsiding pandemic has shown that we can take care of each other if necessary; we have each learned a lot about our ability to organize work and life in a different way. And economically: the current upswing is accompanied by a growing realisation - thanks to the German Federal Constitutional Court for the wake-up call - that economy without serious ecology will not work for much longer and - guess what? - if we tackle it right, can lead to a renaissance of the German and European innovation industry... yes yes, I can hear the criticizers: “Yes, we are innovative, aren’t we?” But wait, I’ll get back to you on that.

The German Constitutional Court has triggered a discussion about the right level of climate protection to achieve CO2 neutrality, the EU is promoting its New Green Deal and the U.S. President is hopefully serious with his initiative. It should not be ignored here that we have by far not only a CO2 problem, but it is also about waste of resources in general. Let’s put this in figures:

- In 2020, nearly eight billion people have consumed around 1.7 planets
- let’s not be blinded by the fact that the pandemic and the accompanying brief slowdown in economic activity have pushed Earth Overshoot Day back slightly: At the end of July, the resources of one earth are exhausted.
- In 2050, around ten billion people will populate the planet. Despite enormous savings in the developed world, this will amount to a consumption of two planets per year, because everyone would like to enjoy the amenities of modern society.

SOMETHING HAS TO CHANGE
BOTH PERSONALLY AND SOCIALLY

LIFE ON EARTH MUST ALSO BE POSSIBLE IN THE FUTURE

That this cannot work should be clear to everyone, but what are the consequences? I will spare us the cynical and unthinkable answer and say it optimistically/realistically: we have to work - as mankind (by the way, including companies, lobbyists, autocrats and other “more-equals”) - towards the fact that we, with ten billion people, use only ONE planet, and repair this ONE planet, if possible, in such a way that human life is

possible not only in 2050, but also in 2060, 2070 and so on. Everything, all our activities as humanity, whether individually, as societies, or as economies, that do not support this goal are irrelevant.

INNOVATION PER SE IS NOT A SAVIOUR BUT A TOOL

This is a big task, bigger than anything we have done so far, and it needs a gigantic global social effort to implement this "divided by 2". Just as in 1969 all people flew "with the Americans to the moon", we need this spirit of a "new moon landing" in which we all participate, just to preserve planet Earth for human life. Although, the planet could do easily without us, as it did for 4.5 billion years.

We are still in a comfort bubble that deludes us into thinking that human innovation will help pull us out of the swamp Munchausen-style. That will not be the case. Let me just remind you that the use of the Internet has led to a monstrous increase in electricity consumption worldwide - and IoT via 5G hasn't even really started yet. If you consider the precarious circumstances under which many raw materials necessary for modern technology are produced or mined, you will not encounter the word sustainability in the process. "Innovation" per se is not a saviour but a tool to achieve the above goals and has to be subordinated to the same :2 principle. Likewise, "sustainability", "CSR" (Corporate Social Responsibility), "ESG" (Environmental Social Governance) or "Circular Economy". If someone says "sustainable" to you, ask how they define it ...

> IN 2050, AROUND TEN BILLION PEOPLE WILL CONSUME TWO PLANETS PER YEAR

ENSURE THAT SMART TECHNOLOGY ALSO GENERATES PROFIT

Smart cities, which are currently being discussed everywhere and are gradually emerging, are an excellent example of what the "new moon landing" means: If 70 percent of these ten billion people live in cities in 2050 - cities of up to 50 million people or more - then the organization of such mega-cities can no longer be realized with today's methods because they are not based on resource conservation. If you now use technologies - IoT, AI, Big Data - to get more efficiency, quality of life and sustainability out of them, you have to make sure that this immense technology (literally billions of sensors providing data) does not eat up the efficiency, quality and "sustainability" gains again.

Provided that smart city projects are designed from the perspective of the people, that smart city protagonists do not just cram cities full of technology but follow the "true" sustainability principle (:2) and also realize the efficiency gains, they can trigger a real surge in innovation. What future archaeologist Markus Iofcea from UBS-Y Think Tank calls the "trillion sensor society" means intelligent IoT modules, 5G connections, AI and data centre performance galore - a huge market in which those who find stable business models à la "living as a service" can make any number of sales - tens of billions of Euros.

EUROPE'S COMPETITIVENESS IN A GLOBAL CONTEXT

Now let's take a look at Europe's competitiveness in a global context and what the current chip shortage has to do with it. Let's start with the latter. The dramatic development of the global semiconductor market in recent months, with a huge surge in orders from all sectors that can only be inadequately served, is leaving many European customers out in the cold - and not only them, allocation is affecting all customers worldwide, albeit to varying degrees. It's stupid, but we've seen it many times in the past. Much more important is the question whether the current chip shortage is different from those in the past and whether this can and will lead to structural changes in the semiconductor industry. The answer to both questions is yes, and the driving force is the USA.

While the EU is still discussing giving US semiconductor manufacturers billions for the production of 5 nm chips, which are then sold to US companies, the USA is reorganizing the entire semiconductor supply chain to ensure that it does not become dependent on China or that Taiwan does not become a geostrategic high-risk area. This can be done if the majority of chips produced in wafer fabs are based on US IP (intellectual property) and/or end up in US end products.

GERMANY PUBLISHES LESS ON IC DESIGN THAN BELGIUM

Europe is different: Total European chip consumption is probably smaller than that of a single well-known American smartphone manufacturer.

Europe's share of global chip consumption is less than ten percent, and its IP share is unlikely to be much larger. As the German "Stiftung Neue Verantwortung" (New Responsibility Foundation) clearly points out in its publication "Who is developing the chips of the future?", Germany's share of worldwide publications on IC design is smaller than Belgium's, and at best represented by the Fraunhofer-Gesellschaft.

THE USA IS REORGANIZING THE ENTIRE SEMICONDUCTOR SUPPLY CHAIN

Where, after all, are the German universities, students and companies that deal with chip designs suitable for the mass market?

What good is it if expensive high-end factories are sponsored here whose chips are not designed here and certainly not used here because they are too high-tech? This is not just a German problem – Europe whole is developing much less IP than the US and Japan and is about to lose out against China, too.

WHO, IF NOT SMES ACROSS EUROPE, WOULD BE PREDESTINED TO HELP DRIVE THE DIGITAL FACTORY AND DIGITAL CITY FORWARD

SENSORS INSTEAD OF HIGH-END IC FABS: POLITICS MUST SET THE RIGHT FOCUS

This is where politicians need to start if they want to change things in the long term and not only have the automotive industry and engineering in mind. Instead of patting themselves on the back with Industry 4.0, they should perhaps focus on Cleantec 2.0. In my definition, that is anything that serves the :2 goal described above - and not just in terms of words, but in terms of effect on the environment (not just climate, but also resources).

Who, if not SMEs across Europe, would be predestined to help drive the digital factory and digital city forward, with Chip-able IP concepts that include everything from IoT, AI, cloud, energy efficiency and environmental compatibility, and do so on a mass scale? Why should the tens of billions of smart sensor MCUs that would be needed to do this not come from here, be leading-edge, and be in demand by the billions in China and the U.S. as well? A mass market that is not "throw-away-goods" but serves the "new moon landing": here it is.

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