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# NEWSLETTER

## Starvation and Headache to Indigestion...

ADAM FLETCHER, ECSN



The market cycle we're currently experiencing has been seen many times in the past and sadly, many leading industry analysts are predicting more of the same. In this article **Adam Fletcher**, Chairman of the Electronics Components Supply Network (ecsn) and IDEA, sets out why he believes that we're currently in the middle of an industry cycle that has arguably moved through a period of component "starvation", improving slightly last year to "headache" and in 1H'24 has entered a phase of "indigestion"...



Prior to the COVID pandemic the overall capacity in the global electronic components markets was generally able to meet the real customer demand, which geographically speaking, was historically cyclical throughout the year. Demand for specific passive and semiconductor components in some regions did occasionally outstrip manufacturers' ability to supply, this resulted in unwelcome large increases in lead-times but these supply difficulties were generally resolved quickly within the free market. Over the past decade the frequency of these demand and supply fluctuations started to escalate and it became obvious to industry analysts that the capacity in the global electronic components market for some passive and semiconductor components was becoming too finely balanced. The primary reason for this is our industry's collective inability to accurately forecast demand, a situation that has significant influence on manufacturers' willingness to commit to making large investments in new capacity with the promise of uncertain returns. These problems are compounded by the investment made by leading-edge companies in manufacturing capacity in a few highly focused geographic locations in a bid to increase various "economies of scale", improve efficiency and reduce costs.

**"THE PRIMARY REASON FOR THIS IS OUR INDUSTRY'S COLLECTIVE INABILITY TO ACCURATELY FORECAST DEMAND,"**

### "STARVATION..."

Accustomed to managing supply based around an annual, fully predictable wave of demand and supply between the West and the East, the electronic components industry was simply unable to meet the immediate massive increase in global demand once the COVID pandemic began to ease. The result was that manufacturer lead-times for most semiconductor and many passive components rapidly progressed from 4 to 26 weeks followed by "allocation", where the manufacturer refuses to accept new orders and prioritise its output to serve outstanding customer orders only.

1 / 2024



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### 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

Despite continent-wide population lockdowns, industry closures and severe logistics problems manufacturer authorised distributors, who serve over 98% of all the global customer base, did their best to fairly serve their customers from the considerable inventory levels they routinely maintained. Compare this to the manufacturers' direct customers with Just-in-Time manufacturing systems who had zero "buffer inventory" to fall back on. Many were forced to stop assembly and, in some cases, even close their factories.

## “AUTHORISED DISTRIBUTORS DID THEIR BEST TO FAIRLY SERVE THEIR CUSTOMERS FROM THE INVENTORY LEVELS,,

### “HEADACHE...”

Customers in the electronic components markets had for over a decade become accustomed to manufacturer lead-times of four to six weeks. The inventory and order cover calculations automatically made by an organisation's Enterprise Resource Planning (ERP) system is highly influenced by the lead-time values and in the face of rapidly escalating delivery times massively increased in-house inventory and supplier order cover in a bid to meet the new targets. Together with an increase in "double ordering" (customers placing orders for the same components on multiple suppliers with the intention of cynically cancelling the other orders as soon as one delivers), this exacerbated rather than eased supply headaches by contributing massively to the fictitious demand.

The spectre of some of the largest customers, particularly automotive manufacturers, shutting down production due to a shortage of electronic components - particularly of semiconductors - increased awareness by politicians and the general public to the importance of electronics to global economic activity. It also raised concerns about the geographic concentration of advanced semiconductor manufacturing in Asia and particularly, in Taiwan.

A combination of **government pressure, generous financial incentives** and **demand from direct customers** has persuaded some of the largest semiconductor manufacturers to **invest in new facilities** in the US and Japan and Europe. Obviously, this will help expand the geographic semiconductor manufacturing capacity but will also increase costs by negatively impacting economies of scale and, in the medium-term at least, will inevitably lead to significant overcapacity and the distortion of what was for many years a highly stable free market industry.

### “INDIGESTION...”

It's truism that "what goes up, must come down..." and despite the warnings of industry analysts that customer demand was artificially inflated, the oft forecast glut of semiconductor and many other electronic components is becoming a reality.

In 1H'24 we are living through a period of "supply indigestion" where the inventory pipeline right across the electronic components supply network has become hugely inflated. Many semiconductor manufacturers currently have **in-house inventory that exceeds 200 days output**, which combined with the inventory currently held by their authorised distributors will take at least two calendar quarters - possibly three - to run down. The in-house inventory held by our members' customers (systems integrators) is also well above normal levels and they too will want to "consume" this inventory down to their "new normal" level prior to any replenishment activity.

Worse...It's a racing certainty that the product mix currently held in inventory across the global electronic components market is entirely wrong for current customer requirements. The components needed to rectify this will have to be produced against the prevailing manufacturer lead-time, which for most semiconductor products is realistically a minimum of 18 weeks. But semiconductor manufacturers have so much cash invested in existing inventory that until it "turns" (is sold and paid for) they are unwilling to build the components currently in most demand.

The inventory held by manufacturer authorised distributors is also at grossly inflated levels, and they too cannot justify increasing investment in inventory that doesn't turn, so more sporadic shortages are to be expected. It's a sad fact that many semiconductor manufacturers are already seeing their capacity utilisation rates fall to unacceptable levels and are using this as an opportunity to undertake maintenance operations and furlough staff.

## “THERE IS VERY LITTLE ADDITIONAL COST IN COLLABORATION,,

### CONCLUDING THOUGHTS...

I'm confident that stronger underlying "real" growth will return to global electronic components markets in 2025, which leaves ample time for all parties to collaborate on their demand planning initiatives.

Supply network collaboration can go a long way towards mitigating future supply and demand imbalances at a time when **many geopolitical and economic uncertainties threaten to impact the market**, I encourage all organisations dependent on our industry to play their part in its continuing success by participating and contributing to this collaboration process, both up and down their supply network.

There is very little additional cost in collaboration the improvements it can make to an organisation's competitive advantage promises much for them, their business partners and the global economy as our industry moves forward.

# Components distribution: Back from the future

GEORG STEINBERGER, FBDi & IDEA



We do not yet know exactly what will happen in the fourth quarter of 2023, but the consolidation trend that has manifested itself after almost two and a half years of unchecked growth is likely to continue. Turnover is slowing down at a still high level and the order situation is expectedly restrained. In other words: *“the past is a future that has already happened.”*

In case I confused you with the quote, this is the motto of the famous **steampunk movement**.

What does this have to do with distribution? Well, the great shortage of 2021 and 2022 led to reactions: Nobody would like to experience such a situation with 1 year or longer delivery times again, so many orders that extended far into the future were placed. Many manufacturers and distributors only applied strict no-cancellation/no-return rules due to the long range and financial risk. The future was therefore already booked in the past and to a large extent also delivered, with record figures for orders and sales in around 10 quarters.

Now we are back OUT of the future and are seeing a market consolidation that was as overdue as it was inevitable. And this will continue until the customer warehouses are empty again, possibly a little longer, as the general economic signals, which were also visible in front of our industry are not as encouraging as we would like them to be. With the exception of automotive and military/aerospace, the outlook is rather subdued, and it remains to be seen whether the emerging boom in AI chips will also have a positive impact on Europe.

Although 2023 still showed slight growth - due to the good first half of the year - distribution sales will not be able to remain at this crazy level in 2024. The reason is simple: based on the figures from **DMASS Europe** (85% market coverage in Europe), European component distribution achieved growth of around 75% between 2020 and 2023, to over **EUR 21 billion**. It is obvious that this was not (just) a miraculous increase in the market thanks to unforeseen innovations, but a post-Covid lag effect, coupled with price increases, allocation and panic buying.

It is probably difficult to convey that, with normal growth rates, the sales level achieved in 2023 would only have occurred a few years later and that normality has now simply returned. I would be happy if journalists and newspapers would present this in such a factual way and not immediately write about a market slump or contraction when overdue regulation at record levels sets in, but so be it. I recommend the Good News website (<https://goodnews.eu/>) as an exercise in “half-seeing”.

By the way, if you want to stay positive, it is better not to read

the PMIs (*Production & Manufacturing Index*) published monthly by Standard & Poors. They reflect the manufacturing industry’s confidence in future growth, or mistrust, because since the middle of last year they have been falling to subterranean levels all over the world. You never know whether the perceived situation is worse than the reality, which I could certainly understand in view of the many crises worldwide.

In Germany in particular, the demise of the West is the order of the day if, for example, a Christmas tree is missing in a nursery.

## EXPECTATIONS

Back to our market: the component industry has its own dynamics and does not always run parallel to the overall development. This is because it is super-innovative, complex, global, diverse and structured differently in every region.

The question remains: **Now that the allocation is mostly over and everyone has full warehouses, what’s next?**



Let's take the **World Semiconductor Trade Statistics (WSTS)**, the market analysis arm of the Semiconductor International Association. It recently presented its fall forecast for 2023 and 2024 and revised the global growth outlook for 2023 from -10% to -9% (Europe: plus 6%). For 2024, the WSTS even expects +13% worldwide (Europe: +4.3%). Comparison of distribution: With a lot of luck, 2023 will remain just positive (no wonder, with 75% growth in 3 years) and 2024 will see a downturn from this high level, i.e. in the opposite direction to the WSTS expectations for Europe. Contradiction? No, but different customer structure and different timing, as experienced dozens of times in the past.

The first key question: where do the "high" expectations for the market as a whole come from? Globally, they are based on 2024 and revised the global growth outlook for 2023 from -10% to -9% (Europe: plus 6%). For 2024, the WSTS even expects +13% worldwide (Europe: +4.3%). Comparison of distribution: With a lot of luck, 2023 will remain just positive (no wonder, with 75% growth in 3 years) and 2024 will see a downturn from this high level, i.e. in the opposite direction to the WSTS expectations for Europe. Contradiction?

No, but different customer structure and different timing, as experienced dozens of times in the past.

## “THE TERM ‘THE MARKET’ ALONE IS ACTUALLY WRONG,,

The first key question: where do the "high" expectations for the market as a whole come from? Globally, they are based on 2 product groups: **AI-based logic** (mainly GPUs) and so-called high-bandwidth memories, which are system-critical for the success of AI in data centers. **Memory** alone is expected to grow by 44%, mainly in the USA and Asia. In fact, the USA is set to grow by 22% next year, as **AI is booming** across the board there, as can be seen from the quarterly results of Nvidia, the GPU giant that has just overtaken Intel and Samsung in terms of semiconductor sales.

Without this special effect, the market remains cautiously positive, but the term "the market" alone is actually wrong, as we are talking about many submarkets that tick differently but somehow influence each other: AI servers also need analog ICs, ordinary controllers and many commodities that are also used in automobiles, industrial electronics and other applications.

And in Europe, this AI boom is only partially taking place at best, at least not at the hardware level. And which market segments play the most important role in this country? **Automotive and industrial**. This also explains why the WSTS assumes only 4% growth for Europe in 2024, as the automotive industry continues to fuel high expectations - mainly driven by e-cars. In contrast, there are few positive signals from the industrial electronics sector

(I asked the WSTS specifically).

Component distribution will also benefit from the AI boom at the earliest when customers start demanding AI hardware, but this still requires a lot of educational and design work.

The **outlook for 2024** therefore remains manageable. The only thing that could change this would be a renewed shortage of a broad spectrum of components - AI boom in the USA combined with reduced capacities at many manufacturers - but who wants to bet on that? Incidentally, this year of consolidation will not change the long-term prospects for the success of the semiconductor industry, including in Europe and therefore also our distribution industry.

The second Gretchen (or perhaps Hänsel) question relates to the political influence on the semiconductor market and the **semiconductor industry**, sufficiently documented by the "Chips Acts" in the USA, Europe, Japan, Taiwan, Korea, India and, of course, China: **What impact will these subsidies have on the structure of the semiconductor business?**

In the "West", the plan seems to be to increasingly keep China out of - at least leading-edge - manufacturing, and in China to ensure self-sufficiency as far as possible. The result will probably be the existence of two economic blocs that want to secure their share of the market. Will this work or will the global business model collapse due to a lack of economies of scale?

This is not yet an issue in the short term, but as soon as all the announced 300-millimeter fabs are in place (from 2025?), it will become clear whether the capacities are all needed and what this means for profitability.

Incidentally, **SEMI International** "complained" that there might not be enough fabs for the famous trillion US dollars in semiconductor sales in 2030. Knometa Research, on the other hand, published a statement in the course of this year that 230 300-millimeter wafer fabs will probably be at the start in 2027.

With an estimated turnover of 750 to 800 billion US dollars, this would mean an average turnover of 3.5 billion dollars per fab (of course, you have to take into account that a lot of old 200-millimeter fabs will still be running at that time). Is that enough to justify the horrendous investments?

## DISTRIBUTORS' ROLE

**Where does distribution stand in this redefinition of globalization?**

**Is the distribution model as we know it under pressure?**

I would say no more and no less than in the last 40 years.

Adapting to new circumstances, a stronger focus on digitalization and efficiency, defining new business models and, last but not least, looking beyond day-to-day business to trends and customer pain points are the key requirements for remaining relevant.

So far, this has been successful despite some disruptions.

However, it would be dangerous to overlook political trends. When executives in the semiconductor industry discuss a redesign of the semiconductor supply chain, they are not necessarily only referring to China.

# Q4 2023: Too much stock in the Supply Chain dominates the Market

The global conditions that dominated the second half of 2022 continued throughout 2023. The global economy continued to decline as the effects of the war in Ukraine impact energy costs causing global inflation and a lack of confidence. In the last quarter of 2023, the Israel/Gaza conflict and the wider instability in the Middle East region has further impacted the global economies. The slowing of demand continues to bring down lead times on electronic components and prices are once again under pressure. Following on from the post-Covid boom when order books were full- and long-term commitments needed to obtain products, the whole supply chain from suppliers to customers is now overstocked and a period of lower sales (billings) and even lower order placement (bookings) is now happening across all products and regions. Against this background the IDEA European Electronic Components statistics show although total sales in Europe were 5.2% higher in 2023 than in 2022, the bookings for the year were 40.7% lower than in the previous year meaning that a slowdown in sales for at least the first half of 2024 is inevitable.

AUBREY DUNFORD, IDEA



The European Electronic Components Distribution Market peaked at €3.5B per quarter in the first quarter of 2023 but had fallen to €2.7B in the last quarter as shown by the Q4 2023 European Electronic Components Statistics. Billings were 12% lower in Q4 2023 than in Q4 2022 and 12% lower than in Q3 2023.

Total billings measured by these statistics were therefore €12.7Bn in 2023 which is 5.2% higher than the €12B total in 2022.

**“TOTAL BILLINGS WERE €12.7BN  
IN 2023 WHICH IS 5.2% HIGHER  
THAN IN 2022,,**

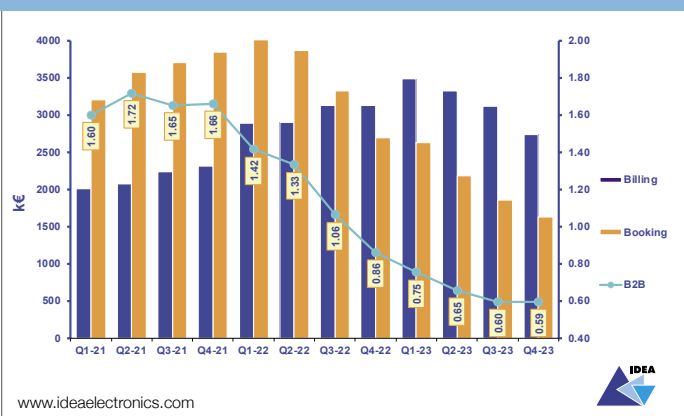
Although some of this growth is due to increases in prices 2023 was still a good year for the European Electronic Components Market.

Total Bookings in 2023 were only €8.3B compared to €14B in 2022. Bookings in Q4 2023 were 12.4% lower than in Q3 2023 and 39.5% lower than in Q4 2022. Total bookings for 2022 were just 0.4% higher than for 2021 total.

As can be seen in *Graphic T1*, after the COVID 19 pandemic the book:bill ratio rose to 1.72 in the second quarter of 2021. Since that time the ratio has declined, passing back below unity in Q4 2022.

Since then, it has declined further and for the second half of 2023 settled around 0.6. Until an upturn in this ratio is seen an increase in sales cannot be expected so it is now clear that the market will remain depressed for at least the first half of 2024.

4TH QTR. 2023 TOTAL COMPONENTS BOOKING, BILLING & BOOK : BILL RATIO *Graphic T1*  
Total distribution electronic components booking, billing and Book:bill ratio for Germany, France, Italy, UK, Sweden, Norway, Denmark, Finland, Switzerland and Austria



### MODERATING INFLATION AND STEADY GROWTH OPEN PATH TO SOFT LANDING.

According to the International Monetary Fund's World Economic Outlook (WEO) published in Jan 2024 – "Global growth, estimated at 3.1 percent in 2023, is projected to remain at 3.1 percent in 2024 before rising modestly to 3.2 percent in 2025. Compared with that in the October 2023 WEO, the forecast for 2024 is about 0.2 percentage point higher, reflecting upgrades for China, the United States, and large emerging market and developing economies. Nevertheless, the projection for global growth in 2024 and 2025 is below the historical (2000–19) annual average of 3.8 percent, reflecting restrictive monetary policies and withdrawal of fiscal support, as well as low underlying productivity growth. Advanced economies are expected to see growth decline slightly in 2024 before rising in 2025, with a recovery in the euro area from low growth in 2023 and a moderation of growth in the United States. Emerging market and developing economies are expected to experience stable growth through 2024 and 2025, with regional differences.

### “THE DOWNWARD REVISION TO THE PROJECTED PATH OF INFLATION, IMPLIES A SOFTER-THAN-EXPECTED LANDING,,

Growth in the euro area is projected to recover from its low rate of an estimated 0.5 percent in 2023, which reflected relatively high exposure to the war in Ukraine, to 0.9 percent in 2024 and 1.7 percent in 2025. Stronger household consumption as the effects of the shock to energy prices subside and inflation falls, supporting real income growth, is expected to drive the recovery.

Among other advanced economies, growth in the United Kingdom is projected to rise modestly, from an estimated 0.5 percent in 2023 to 0.6 percent in 2024, as the lagged negative effects of high energy prices wane, then to 1.6 percent in 2025,

### “THE PROJECTION FOR GLOBAL GROWTH IN 2024 AND 2025 IS BELOW THE HISTORICAL ANNUAL AVERAGE,,

World trade growth is projected at 3.3 percent in 2024 and 3.6 percent in 2025, below its historical average growth rate of 4.9 percent. Rising trade distortions and geoeconomic fragmentation are expected to weigh on the level of global trade. Countries imposed about 3,200 new restrictions on trade in 2022 and about 3,000 in 2023, up from about 1,100 in 2019, according to Global Trade Alert data.

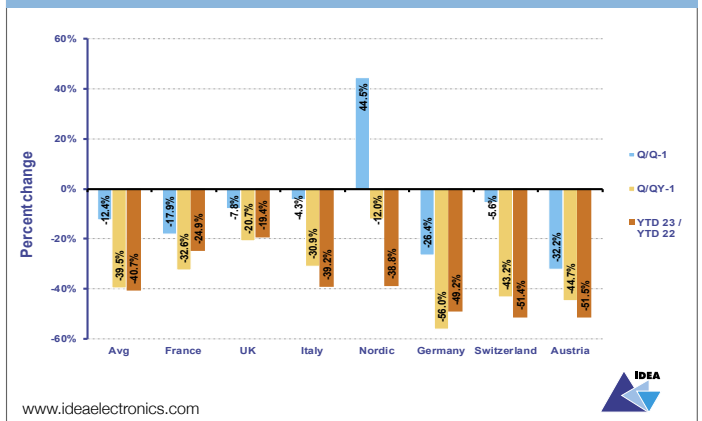
These forecasts are based on assumptions that fuel and nonfuel commodity prices will decline in 2024 and 2025 and that interest rates will decline in major economies. Annual average oil prices are projected to fall by about 2.3 percent in 2024, whereas nonfuel commodity prices are expected to fall by 0.9 percent. IMF staff projections are for policy rates to remain at current levels for the Federal Reserve, the European Central Bank, and the Bank of England until the second half of 2024, before gradually declining as inflation moves closer to targets.

For advanced economies, growth is projected to decline slightly from 1.6 percent in 2023 to 1.5 percent in 2024 before rising to 1.8 percent in 2025. An upward revision of 0.1 percentage point for 2024 reflects stronger-than-expected US growth, partly offset by weaker-than-expected growth in the euro area. In the United States, growth is projected to fall from 2.5 percent in 2023 to 2.1 percent in 2024 and 1.7 percent in 2025, with the lagged effects of monetary policy tightening, gradual fiscal tightening, and a softening in labour markets slowing aggregate demand.

4TH QTR. 2023 TOTAL COMPONENTS BOOKING TREND

Graphic T2

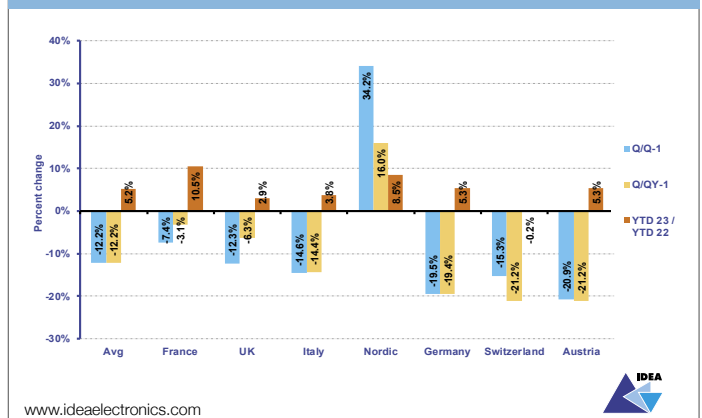
Distribution sales for Electronic components by country comparing current qtr with prior quarter (Q/Q1) and same quarter prior year (Q/QY-1) and YTD 22/21



4TH QTR. 2023 TOTAL COMPONENTS BILLING TREND

Graphic T3

Distribution sales for Electronic components by country comparing current qtr with prior quarter (Q/Q1) and same quarter prior year (Q/QY-1) and YTD 22/21



as disinflation allows an easing in financial conditions and permits real incomes to recover. The markdown to growth in 2025 of 0.4 percentage point reflects reduced scope for growth to catch up in light of recent upward statistical revisions to the level of output through the pandemic period. Output in Japan is projected to remain above potential as growth decelerates from an estimated 1.9 percent in 2023 to 0.9 percent in 2024 and 0.8 percent in 2025, reflecting the fading of one-off factors that supported activity in 2023, including a depreciated yen, pent-up demand, and a recovery in business investment following earlier delays in implementing projects.

Global headline inflation is expected to fall from an estimated 6.8 percent in 2023 (annual average) to 5.8 percent in 2024 and 4.4 percent in 2025. The global forecast is unrevised for 2024 compared with October 2023 projections and revised down by 0.2 percentage point for 2025. Advanced economies are expected to see faster disinflation, with inflation falling by 2.0 percentage points in 2024 to 2.6 percent, than are emerging market and developing economies, where inflation is projected to decline by just 0.3 percentage point to 8.1 percent.

## “THE LARGEST DECREASES IN Q4 2023 WERE IN THE COUNTRIES MOST AFFECTED BY THE CONTRACT EQUIPMENT MAKERS,,

The drivers of declining inflation differ by country but generally reflect lower core inflation as a result of still-tight monetary policies, a related softening in labour markets, and pass-through effects from earlier and ongoing declines in relative energy prices. Overall, about 80 percent of the world’s economies are expected to see lower annual average headline and core inflation in 2024. Among economies with an inflation target, headline inflation is projected to be 0.6 percentage point above target for the median economy by the fourth quarter of 2024, down from an estimated gap of 1.7 percentage points at the end of 2023. Most of these economies are expected to reach their targets (or target range midpoints) by 2025. In several major economies, the downward revision to the projected path of inflation, combined with a modest upgrade to economic activity, implies a softer-than-expected landing.”.

Looking at the data from the Q4 2023 European Electronic Components Statistics we can see:

### Bookings plummet as Billings decline.

As can be seen in *Graphic T3* bookings in Q4 2023 were 12.4% lower than in Q3 2023 and than in Q4 2022. This pattern was very similar in all countries with the exception of the Nordic region where there appears to have been very large bookings and billings in the fourth quarter.

The largest decreases in Q4 2023 were in Germany, Austria and

4TH QTR. 2023 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



Switzerland which tend to be the countries most affected by the Contract Equipment makers. For 2023 as a whole, billings were, as mentioned above, 5.2% higher than in 2022. The increase was lowest in the UK at 2.9% and highest in France at 10.5%.

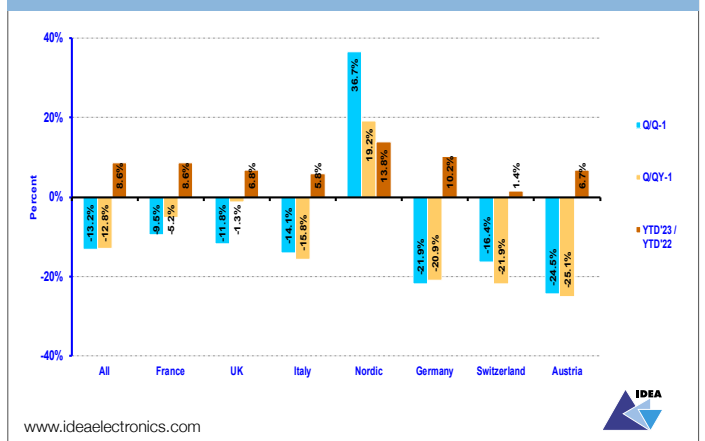
The figures in *Graphic T2* show that bookings in Q4 2023 were overall 12.4% lower than Q3 2023 and 39.5% lower than in Q4 2022. Excluding the Nordic Area where there must have been an exceptional booking, there was a wide variation between countries, with bookings when compared to the last quarter in 2022 were only 20.7% down in the UK but were over 50% down in Germany. Booking in Austria and Switzerland were 44.7% and 43.2% lower respectively.

Overall total bookings in 2022 were virtually identical to 2021.

## QUARTERLY SALES BY PRODUCT FAMILY

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

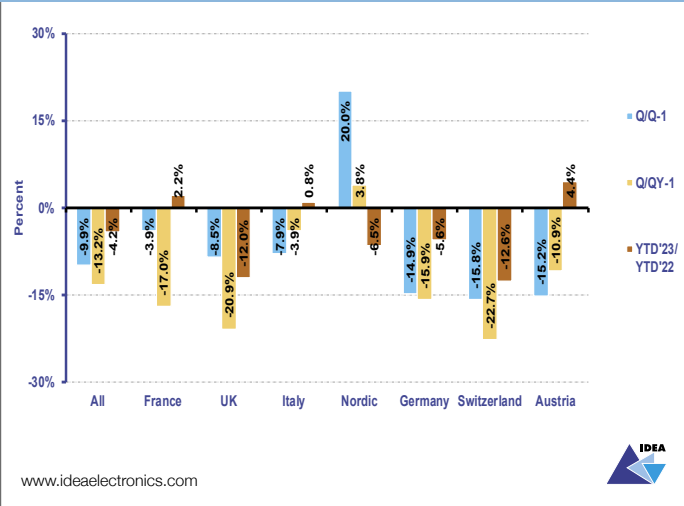
4TH QTR. 2023 SEMICONDUCTOR BILLING TRENDS *Graphic S3*  
Distribution sales for semiconductors by country compared with the prior quarter (Q/Q1) and the same quarter prior year (Q/QY-1) and YTD 20/21



4TH QTR. 2023 PASSIVE COMPONENTS BILLINGS TREND

Graphic P3

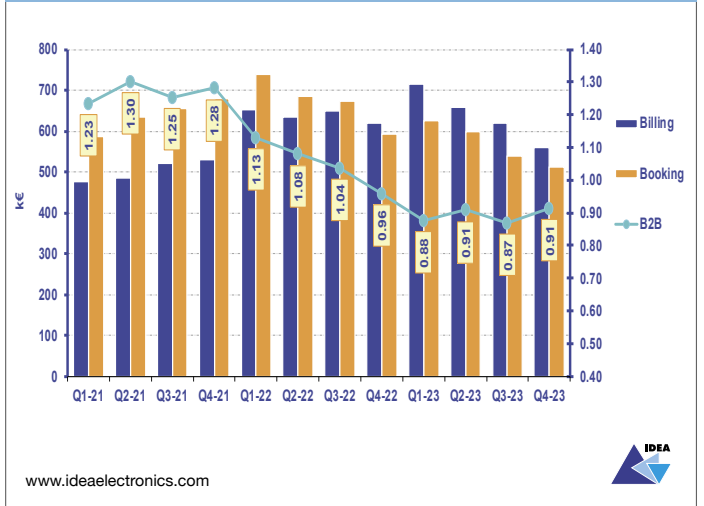
Distribution sales for passive components by country comparing Q2 2017 with the prior quarter (Q/Q-1) and the same quarter prior year (Q/QY-1)



4TH QTR. 2023 EMECH COMPONENTS BOOKING, BILLING & BOOK-BILL RATIO

Graphic E1

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



SEMICONDUCTORS

The book:bill ratio for semiconductors as shown in *Graphic S1* shows the same pattern as for the total components, with the ratio peaking at 1.93 in Q2 2021, but declining throughout 2022 and 2023 hitting 0.47 in both of the last quarters.

As availability of products has improved and lead times have started to return to more normal levels, it is natural that there will be a correction in the bookings. It will be important in the early quarters of 2024 to see if this decline in bookings is just a correction in the order-books (backlog) caused by the build-up of stocks, or indicative of a more fundamental fall in demand.

As can be seen in *Graphic S3* Billings in Q4 2023 were 13.2% lower than in Q3 2023 and 12.8% lower compared with Q4 2022. Billings for the total of 2023 compared to 2023 were 8.6% higher and the pattern is similar in all countries although the range is 1.4% in Switzerland to 13.8% in the Nordic area.

PASSIVES

Similarly to Semiconductors, in the Passives Sector the book:bill ratio peaked at 1.66 in Q3 2021. Since that time the ratio declined to being just above unity by Q3 2022.

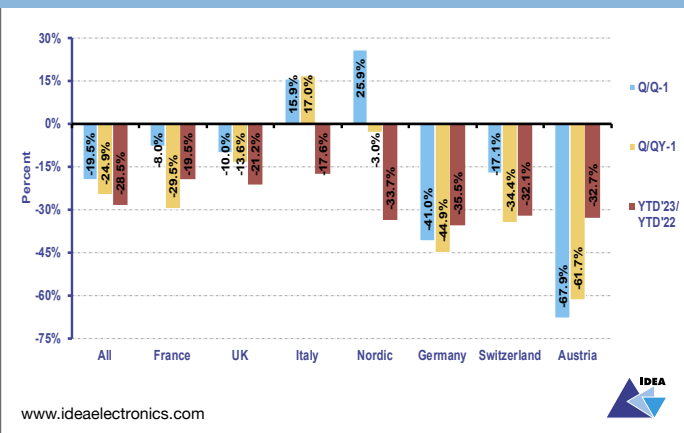
Throughout 2023 it has remained just above the 0.8 level but declined to 0.74 in the fourth quarter. Having decreased by 9.9% in Q4 2023 when compared to Q3 2023, sales of passives, as can be seen from *Graphic P3*, declined in Q4 2023 compared to Q4 2022 overall by 13.2 and in all countries except the Nordic region. Overall sales were 4.2% lower in 2023 compared to 2022.

Bookings for Passive Products have continued to decline rapidly (*Graphic P2*). For Europe as a whole, bookings declined by 19.5% in Q4 2023 compared to Q3 2023, by nearly 25% compared to Q4 2022 and by 28.5% for 2023 as a whole compared to 2022. This pattern is similar in all countries with the exception of the Nordic region and Italy.

4TH QTR. 2023 PASSIVE COMPONENTS BOOKING TREND

Graphic P2

Distribution orders for passive components by country comparing Q2 2017 with the prior quarter (Q/Q-1) and the same quarter prior year (Q/QY-1)



E-MECH AND OTHER COMPONENTS

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, peaking in Q2 2021, followed by a slow decline but remaining positive until Q3 2022 but then declining to 0.88 in Q1 2023 since when it has remained around the 0.9 level.

Billings decreased by 10% in Q4 2023 compared to Q3 2023 and overall billings in Q4 2023 were just over 9.6% lower when compared to Q4 2022. Overall Billings in 2023 were the same as in 2022. Again, with the exception of the Nordic region there was a similar picture across the different countries except France where overall sales in 2023 were nearly 24% higher than in 2022.

Total Bookings for 2023 were 15% lower than in 2022. Bookings in Q4 2023 showed just over a 5% decrease on Q3 2023 and a decline of 14% compared to Q4 2022.



# Where have all the workers gone?

GEORG STEINBERGER, FBdi & IDEA



In 2024, Europe faces a multitude of challenges, from wars to economies at the brink of stagflation, from energy pricing to a shortage of skilled workers in almost every sector of the economy. All of these can affect our industry of electronics components and systems. In my humble opinion, one problem stands out.

Originally I wanted to write about reshoring. However, since the first signs of it appeared after the start of the Russian war against Ukraine and since the giant “*chip*” shortage has started to ease, the discussion about reshoring has lost its steam, primarily because economic reality has kicked in: reshoring only makes sense where it is economically feasible, where you control the supply chain of your end product or where the risk of IP theft or security breaks are too high to ignore.

Another problem took centre stage: **skilled labour shortage**. During the post-Covid surge in almost any sort of high-tech equipment and the subsequent shortage of components to build them, a problem that accompanied the supply chain disruptions and production bottlenecks was the realization that there aren't enough experienced people left in our industry. The reality is

that many countries in Europe have an overaged society with a shrinking population and a giant generation of workers, technicians, engineers and experts – the boomers, a.k.a. the backbone of the economy – who are going into retirement or will soon.

**“THE BACKBONE OF THE ECONOMY ARE GOING INTO RETIREMENT OR WILL SOON,,**

One effect among many is that **by 2030 will miss between 700.000 and 1 million engineers, technicians etc.**, just to keep the ship afloat, not to speak of driving mind-blowing innovations.

## News from Italy

### POWERUP MILAN AND VIRTUAL: SEPT. & OCTOBER

*AspenCore and Tecno announce their partnership as organizers for the PowerUP and Fortronic Conference & Exhibition, set to take place Sept. 18–19, 2024 in Milan at the NH Milano Congress Centre.*

In a landmark collaboration, AspenCore and Tecno, two leading forces in engineering and technology media, proudly announce their partnership as organizers for the PowerUP and Fortronic Conference & Exhibition 2024, set to take place Sept. 18–19 in Milan at the NH Milano Congress Centre and virtually on Oct. 9–10 via [powerup-expo.com](http://powerup-expo.com).

The conference will explore pivotal themes, including power semiconductors (such as GaN, SiC, MOSFET, IGBTs), power management, sensors, converters, tools for testing/measurement, e-mobility/smart-grid infrastructures and motor control. These discussions will delve deep into advancing energy efficiency, reducing carbon footprints through innovative materials and adopting new circuit topologies and technologies.

*“PowerUP Conference is the convergence point where the vanguard of power electronics engineering meets sustainability and innovation,”* said **Maurizio Di Paolo Emilio**, editor-in-chief of Power Electronics News, noting the event’s emphasis on the latest developments in wide-bandgap semiconductors and renewable energy. The conference will host global industry leaders presenting groundbreaking insights through keynote sessions, panels and technical talks.

*“We are proud to start this collaboration, which brings an international scope to Fortronic, opening to new opportunities of visibility and business for our companies,”* said Elena Baronchelli, general manager of Tecno. *“We are confident that this is just the first step toward a successful partnership with AspenCore.”*

#### TOPICS

Power electronics involves a whole range of critical applications, from electrification to smart grids. It is a fundamental pillar for the entire industry to curb climate-change demands and involves increasing energy efficiency, reducing our carbon footprint through new materials and adopting new circuit topologies and technologies.

In energy-saving applications as well as all high-voltage industrial applications, power devices will boost system performance. GaN and SiC technologies may offer a road to more efficient power supply and motor control in industrial settings while simultaneously complementing the growth of renewable energy.

The PowerUP–Fortronic Expo/Conference is where the vanguard of power electronics engineering converges with sustainability and innovation. This event brings the latest developments in power electronics engineering and renewable energy, debated by global industry leaders across keynotes, panels and technical talks.

The conference will dig into several key topics:

- Power semiconductors (GaN, SiC, IGBTs)
- Power management, converters, sensors, passives
- Tools/test and measurement
- Renewable energy
- E-mobility and infrastructures/smart grid
- Motor control

**What to expect:** Expect an immersive experience filled with keynote sessions by global industry leaders sharing groundbreaking insights into power electronics engineering and renewable energy. Participate in panel discussions and technical presentations that center around emerging tools and measurement technologies, power semiconductors (GaN, SiC, IGBTs), power management, sensors and passive components.

Extrapolate to Europe and the number increases to 3 to 4 million. This is a problem. A huge problem. It can determine Europe’s position as an innovative power in the world economy.

The complaints that we are missing people in all kinds of industry or better economy segments, is much older than CoVid, the warning that less and less young people at universities consider technology as a path to success or personal achievement, is as old as I can remember. Which means, economy leaders, politicians, educators had 30 years time to watch the problem mount and do little to nothing against it.

## “LESS AND LESS YOUNG PEOPLE CONSIDER TECHNOLOGY AS A PATH TO SUCCESS,,

Yes, it seems that the educational crisis has been recognized now. Some countries in Europe have been smarter to handle it earlier. The bigger economies however haven’t. In assessing the problem, education experts and politician estimate that hundreds of billions of Europe must be invested in education to keep up with striving nations in Asia. But where are the budgets? Where are the plans?

After talking to department leaders at universities to find out how high-tech subjects are doing (except IT which seems to thrive), I learned that some of them are at the brink of bankruptcy – reason: too few students to maintain the funding. Without international bachelor students (whose efforts to study here are not made easy by an overwhelming immigration bureaucracy) they would have been closed.

## “THE SPEED OF ACTION THROUGHOUT EUROPE IS PRETTY SLOW,,

I am generalising a bit, of course, and there are lighthouse examples in all industries as well as at universities, even in areas like AI. However, the lighthouses are meant to steer ships towards safety and prosperity, and to stay in the metaphor, there are not enough ships to be steered.

Considering that societal transformations take generations to achieve them, the speed of action throughout Europe is pretty slow. And I do not only mean politics. Where are the young people interested in technology that can help innovation forward, also in the sense of some greater goals like climate protection? Clear, technology alone won’t save us, human ingenuity mustn’t focus only on technology to transform society, but it is a good start to keep Europe in a position to make choices in the future and to be relevant in the world.

# The ASP vs Units Conundrum

## A Riddle Wrapped In An Enigma?

MALCOM PENN, CEO of Future Horizons



### Executive Overview

IC ASPs continued to drive the recovery, up 34.7 percent vs. January 2023. They were also up 7.6 percent vs. December 2023, which was untypical for the first month of the quarter.

At the same time, IC unit sales fell 13.9 percent vs. December 2023, again unusual for the first month of the quarter, and were also down 10.4 percent vs. January 2023.

With IC unit demand still in decline, the current furor over the supposed chip market “recovery” needs to be treated with extreme caution bordering on the irrational.



January saw IC ASPs rebound from December’s dramatic downward correction, continuing their now eight-month long recovery climb, up 7.6 percent vs. December 2023. At the same time, IC unit shipments were 27.1 percent lower than the May 2022 8.2 billion maxed-out capacity peak and 16.4 percent lower than the overall long-term trend line, a marked deterioration over last month’s 3.9 percent number.

**“THE CURRENT FUROR OVER THE SUPPOSED CHIP MARKET “RECOVERY” NEED TO BE TREATED WITH EXTREME CAUTION,,**

This is the first time since records began that ASPs have led a market recovery. In the normal course of events, unit growth recovers first, with ASPs following ‘one-year later’. There is no obvious underlying reason for this behaviour, quite the opposite, it flies in the face of fundamental economic supply and demand pricing theory.

Either it will prove to be a curious quirk of statistics or a fundamental, but as yet undetermined, radical shift in market behaviour. Our bet is firmly on the former not the latter, especially given the overall global economic uncertainty.

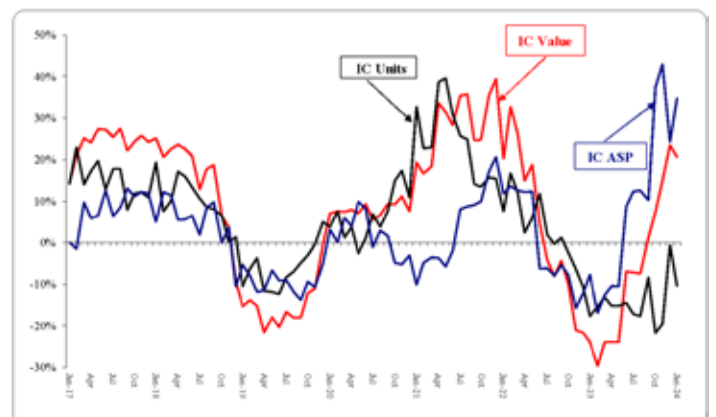
Hopes that the US Federal Reserve would start dropping interest rates towards the end of March were dashed when the most recent inflation data rose at its fastest pace in almost a year, signaling a still bumpy road ahead against a robust labour market, strong growth and a resilient American consumer background. So far, central banks have managed to successfully walk the fine

line between pushing up interest rates to bring down inflation but not to the point of triggering a recession. The chances of a soft landing for the global economy are still strong but the overall economic outlook remains decidedly weak.

### MARKET OUTLOOK

In line with our concern that this ‘recovery’ is not ‘real’, the Opto, Discrete and Analog IC sector growth rates were all much more subdued, either still averaging negative (Discretives and Analog ICs) or low single digit (Opto). These sectors are more representative of the overall strength of the market demand, given they are relatively mature products across a wide usage base.

We believe there is still some way to go before we reach the bottom of the cycle. As we have cautioned before, 2024 may well see the market grow double digit in value, but the real, demand-driven, market recovery is unlikely to kick in until 2025. This “recovery” is not the start of a new semiconductor supercycle.



# 2023 Performance and 2024 Outlook on Connectors worldwide



As industry backlog declined steadily in 2023, so did sales. After a strong 2022, with connector industry sales of \$84,091 million, sales declined by -2.7% in 2023, finishing the year out at \$81,854 million. As the following chart shows, from a quarterly perspective, sales were the greatest in Q1, at \$21,179 million, and the least in Q4, at \$19,581 million. From a year-over-year percentage change perspective, all quarters saw a reduction in sales, with Q3 witnessing the greatest decline at -4.7%.

Examining 2023 from a regional standpoint, the strongest region from a growth perspective was Europe, where sales grew a strong +3.8%. Europe was followed by ROW, where sales grew a mere +0.9%. The region exhibiting the lowest growth was Japan, where sales were affected by not only declining demand, but also currency

fluctuations. Japan was followed by the Asia Pacific region where sales declined -7.3%. If we look at decline in sales from a dollar perspective, although ranked fourth in percent change, China's decline of -5.7% far exceeded all other regions, accounting for a loss of \$1,517.2 million in US dollars!

**“WE ANTICIPATE THE CONNECTOR INDUSTRY WILL GROW +4.2% IN 2024,”**

As the following table shows, we anticipate the connector industry to grow +4.2% in 2024. This will move sales over the 2022 total of \$84,091 million. The greatest growth will be seen in North America, where sales will grow +5.1%, reaching \$19,809.9 million. North America will be followed by Asia Pacific, where sales are anticipated to grow 4.7% to \$11,843.2 million. This will still be below the 2022 high of \$12,194.7 million. The smallest growth is anticipated in ROW, where sales will only grow +2.8%, reaching \$4,164.1 million. It is anticipated that the yen, which has lost an approximate 20% when measured against the dollar since 2021, will continue to rebound, allowing for growth of +3.6% in Japan in 2024.

**2021, 2022 AND 2023 CONNECTOR INDUSTRY SALES BY QUARTER WITH YEAR-OVER-YEAR CHANGE** *Figure 1*

Quarter	2021 Actual	2022 Actual	YOY Change	2023 Actual	YOY Change
1Q	\$19,061	\$21,200	11.2%	\$21,179	-0.1%
2Q	\$19,000	\$20,560	8.2%	\$19,985	-2.8%
3Q	\$20,150	\$22,160	10.0%	\$21,109	-4.7%
4Q	\$19,780	\$20,171	2.0%	\$19,581	-2.9%
<b>Total</b>	<b>\$77,991</b>	<b>\$84,091</b>	<b>7.8%</b>	<b>\$81,854</b>	<b>-2.7%</b>

*\$ Millions*

Source: Bishop Ass.

**2021, 2022 AND 2023 CONNECTOR SALES BY GEOGRAPHIC REGION WITH PERCENT CHANGE** *Figure 2*

Region	2022	Change	2023	Change
North America	\$18,889.0	14.6%	\$18,840.8	-0.3%
Europe	\$17,328.5	6.5%	\$17,992.7	3.8%
Japan	\$5,172.8	-2.0%	\$4,683.7	-9.5%
China	\$26,494.3	6.1%	\$24,977.1	-5.7%
Asia Pacific	\$12,194.7	7.1%	\$11,310.0	-7.3%
ROW	\$4,011.7	11.7%	\$4,049.8	0.9%
<b>Total World</b>	<b>\$84,091.0</b>	<b>7.8%</b>	<b>\$81,854.1</b>	<b>-2.7%</b>

*\$ Millions*

Source: Bishop Ass.

**2021, 2022 AND 2023 CONNECTOR FORECAST BY GEOGRAPHIC REGION WITH PERCENT CHANGE** *Figure 3*

Region	2023 Actual	2024 Forecast	Percent Change
North America	\$18,840.8	\$19,809.9	5.1%
Europe	\$17,992.7	\$18,583.6	3.3%
Japan	\$4,683.7	\$4,852.2	3.6%
China	\$24,977.1	\$26,066.2	4.4%
Asia Pacific	\$11,310.0	\$11,843.2	4.7%
ROW	\$4,049.8	\$4,164.1	2.8%
<b>Total World</b>	<b>\$81,854.1</b>	<b>\$85,319.2</b>	<b>4.2%</b>

*\$ Millions*

Source: Bishop Ass.

As the following chart indicates, although the industry showed a decline of -2.7% in 2023, not all markets declined, nor did the markets decline at the same rate. The automotive market and the military/aerospace markets both showed an increase in 2023, although very modest. The automotive market grew 0.4% and the military/aerospace market grew 0.8%. It has been many years since the military/aerospace market outdid the other market sectors.

The market sector showing the greatest decline was the computers & peripherals market, where sales declined -7.2%. This was primarily a result of harder comparison to 2021 and 2022, when the trend of officing at home was driving the sale of additional computer equipment. Now, with more and more of the workforce being mandated to return to the office, sales in this sector have dropped significantly. The consumer market follows the computers & peripherals market and is a result of weaker home starts, higher interest rates, and inflation, leaving consumers with a reduced amount to direct towards discretionary spending.

## “THE GREATEST DECLINE WAS THE COMPUTERS & PERIPHERALS MARKET SECTOR,,

## “FROM 2023 TO 2024, THE MILITARY/AEROSPACE MARKET WILL SEE THE GREATEST GROWTH,,

**2023 AND 2024 CONNECTOR FORECAST BY MARKET SECTOR WITH PERCENT CHANGE** Figure 5

Market	2023 Actual	2024 Forecast	Percent Change
Computers & Peripherals	\$9,979.5	\$10,226.4	2.5%
Business/Office Equipment	\$875.4	\$893.7	2.1%
Instrumentation	\$2,364.8	\$2,439.0	3.1%
Medical	\$2,659.7	\$2,750.4	3.4%
Industrial	\$10,742.3	\$11,158.8	3.9%
Automotive	\$18,502.7	\$19,357.5	4.6%
Transportation	\$5,857.4	\$6,087.6	3.9%
Military/Aerospace	\$5,092.7	\$5,381.6	5.7%
Telecom/Datacom	\$18,991.4	\$20,025.8	5.4%
Consumer	\$3,744.4	\$3,862.9	3.2%
Other Equipment	\$3,043.8	\$3,135.5	3.0%
<b>Total World</b>	<b>\$81,854.1</b>	<b>\$85,319.2</b>	<b>4.2%</b>

\$ Millions

Source: Bishop Ass.

**INDUSTRY SALES PERFORMANCE BY MARKET SECTOR 2022 AND 2023 WITH PERCENT CHANGE** Figure 4

Market	2022 Actual	2023 Actual	Percent Change
Computers & Peripherals	\$10,758.2	\$9,979.5	-7.2%
Business/Office Equipment	\$922.3	\$875.4	-5.1%
Instrumentation	\$2,424.8	\$2,364.8	-2.5%
Medical	\$2,690.7	\$2,659.7	-1.2%
Industrial	\$10,788.1	\$10,742.3	-0.4%
Automotive	\$18,435.4	\$18,502.7	0.4%
Transportation	\$5,873.4	\$5,857.4	-0.3%
Military/Aerospace	\$5,050.0	\$5,092.7	0.8%
Telecom/Datacom	\$20,022.8	\$18,991.4	-5.2%
Consumer	\$3,967.0	\$3,744.4	-5.6%
Other Equipment	\$3,158.3	\$3,043.8	-3.6%
<b>Total World</b>	<b>\$84,091.0</b>	<b>\$81,854.1</b>	<b>-2.7%</b>

\$ Millions

Source: Bishop Ass.

As previously mentioned, connector industry sales are anticipated to grow 4.2% in 2024. The chart below shows how this growth breaks out across the market sectors.

From 2023 to 2024, the military/aerospace market is anticipated to see the greatest growth, increasing by 5.7%. This growth will be heavily weight by sales in North America, Europe, and China. Together these three regions account for over 86% of total connector sales in 2024.

The military/aerospace market will be followed by the telecom/datacom market with growth of 5.4% and the automotive market with growth of 4.6%.

The smallest growth will be seen in the business/office equipment market sector, where sales will only grow 2.1% and the computer & computer peripherals market where sales are anticipated to grow 2.5%.



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