# Electronics manufacturing, a global perspective

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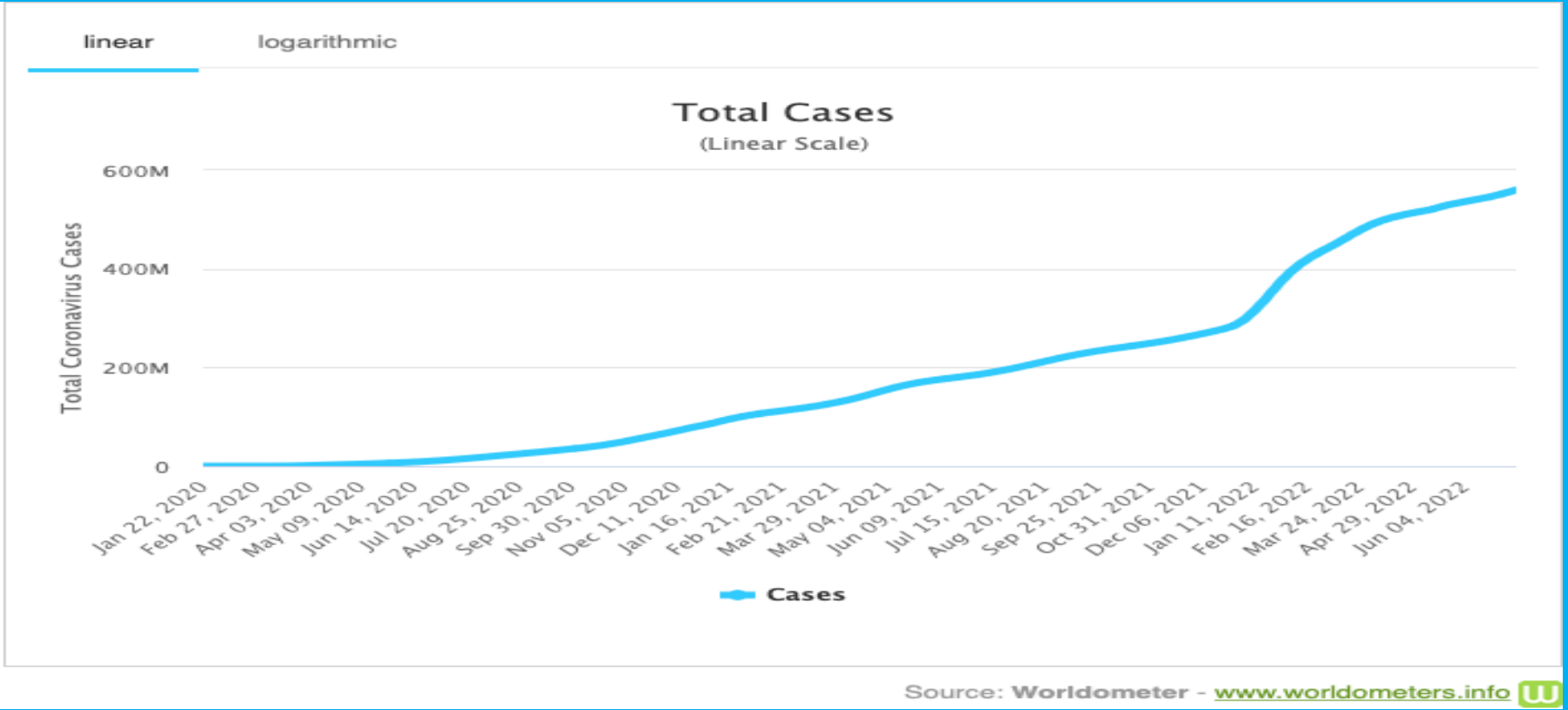
Presented at Pan Pac 2024

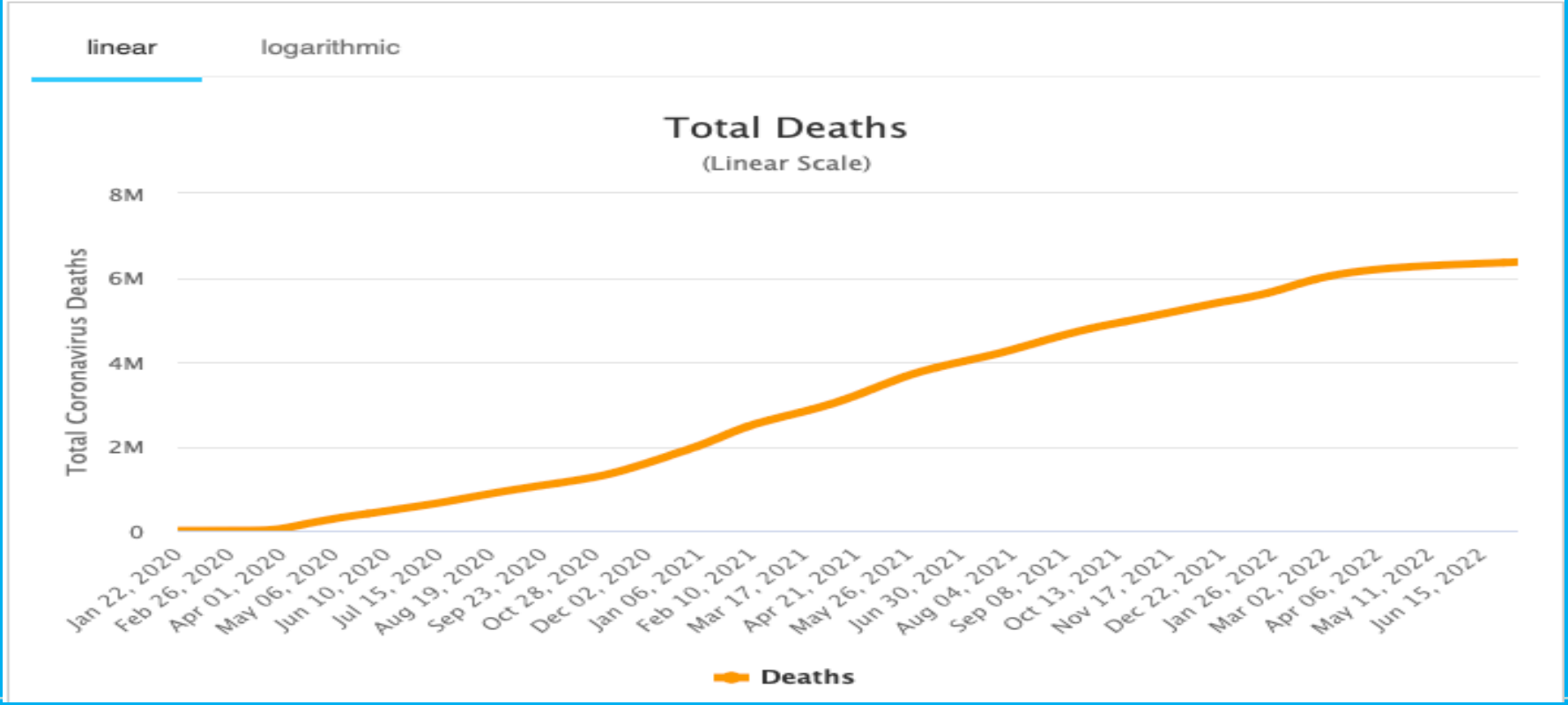
# Agenda

- The Pandemic and wars
- Big picture numbers
- Purchase Managers Indices from around the globe
- Summary and conclusions
- Q and A

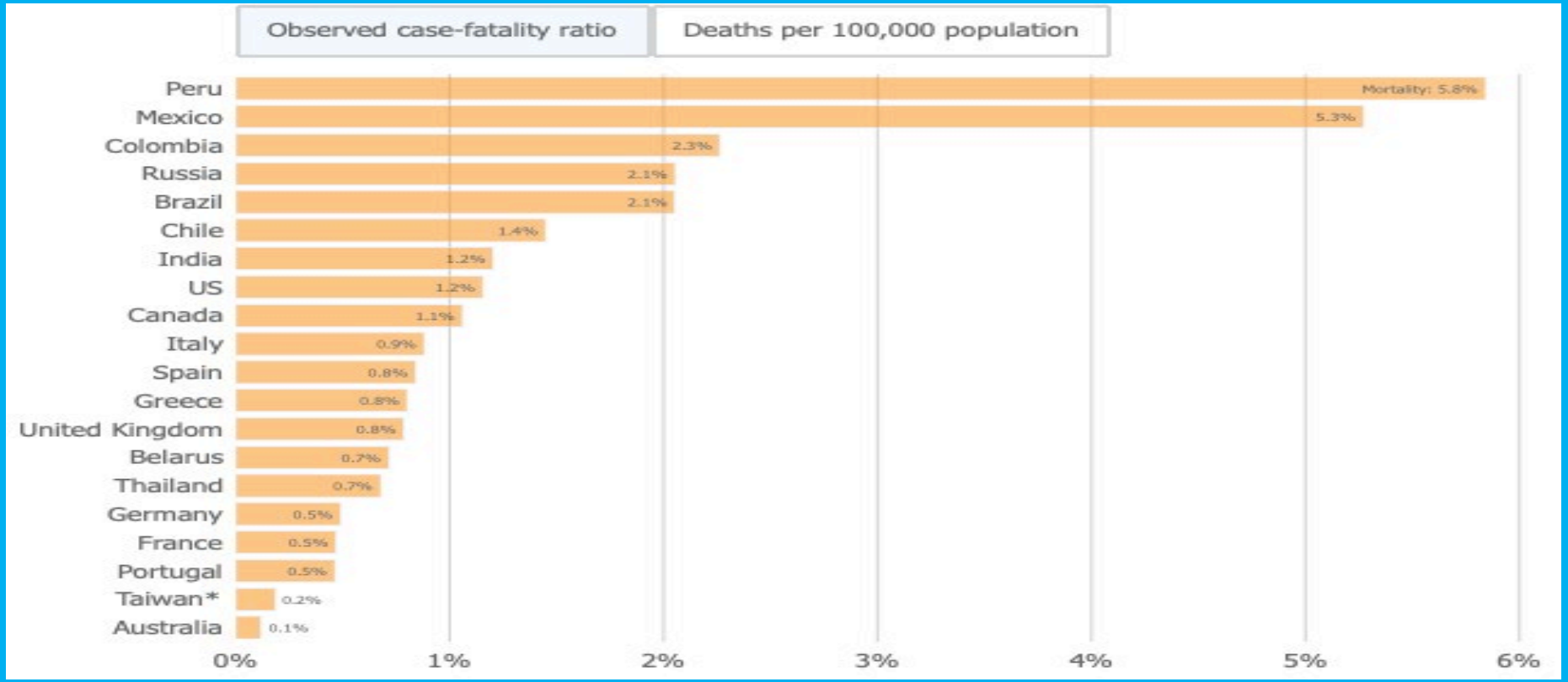
# Global Covid



# Global Covid



# Deaths per 100,000 population

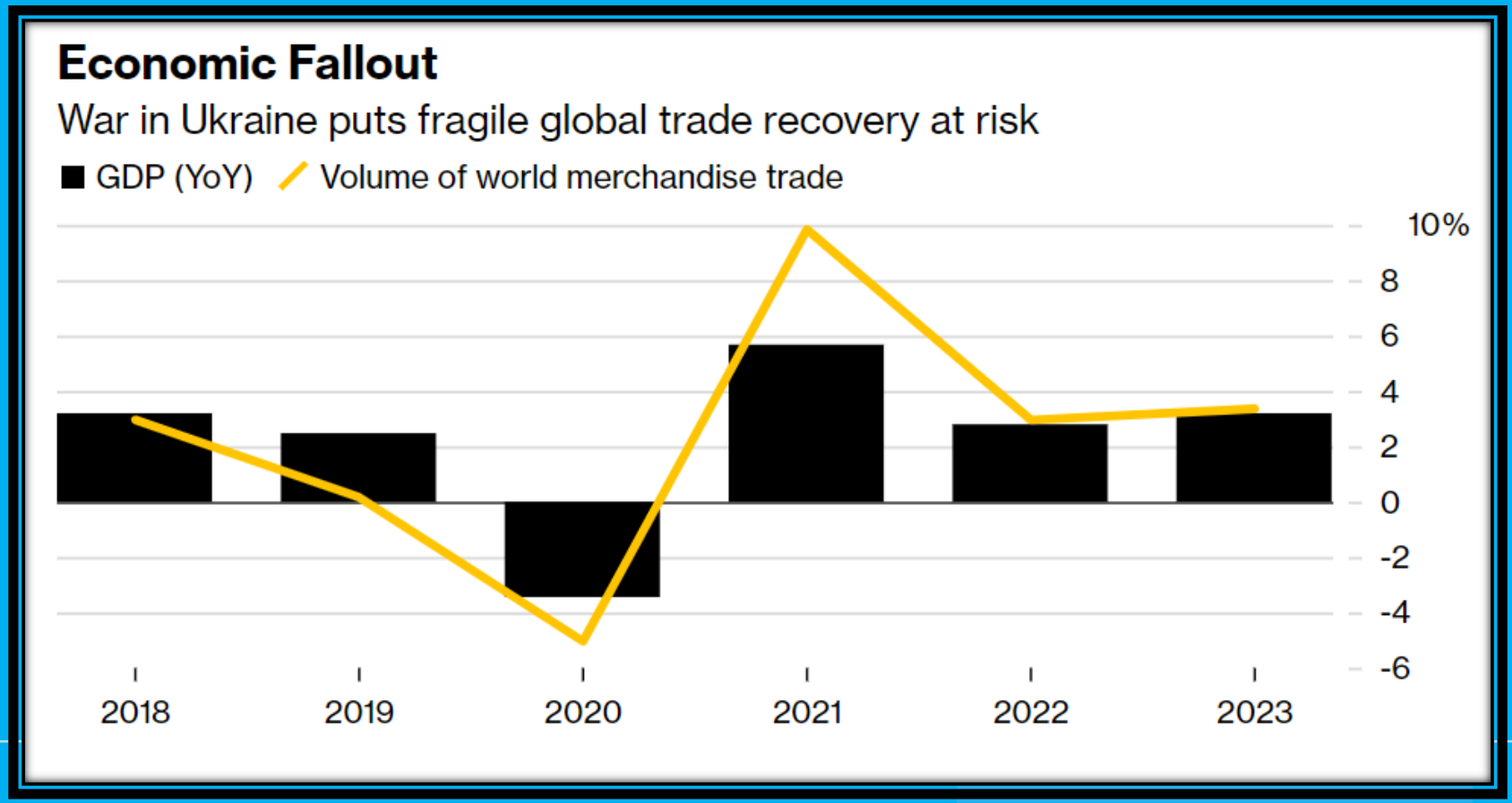


# Manufacturing areas impacted

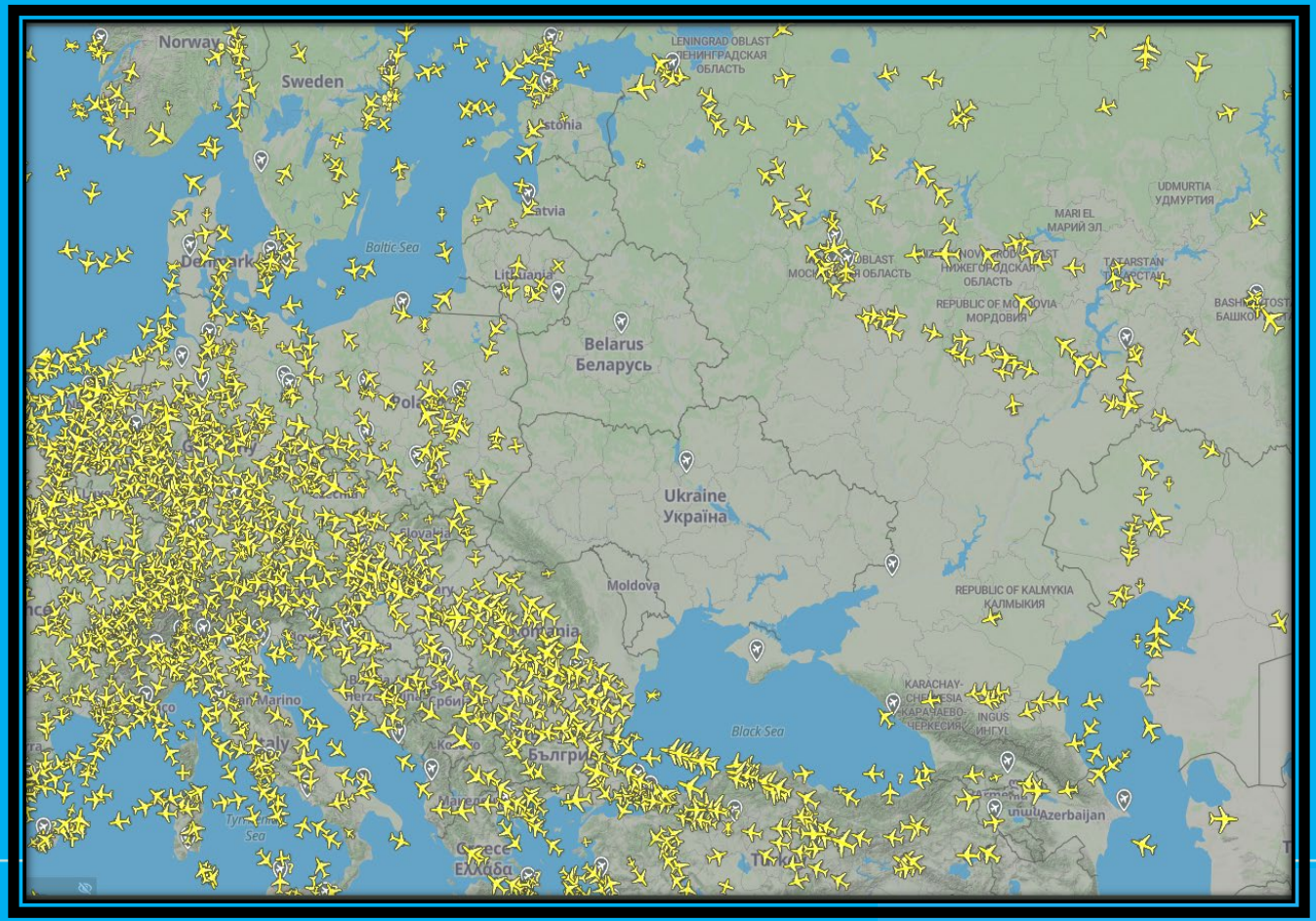
- Labour shortages
- Maintaining a safe working environment
- Materials and Component supply
- Assessment and lines of communication
- **But there was 1 single thing which caused the biggest issues to Electronics Manufacturing**

# Effects of Ukraine / Russia War

(Global Trade and GDP Forecast)



# Air Traffic to Avoid the War – Dec 2023



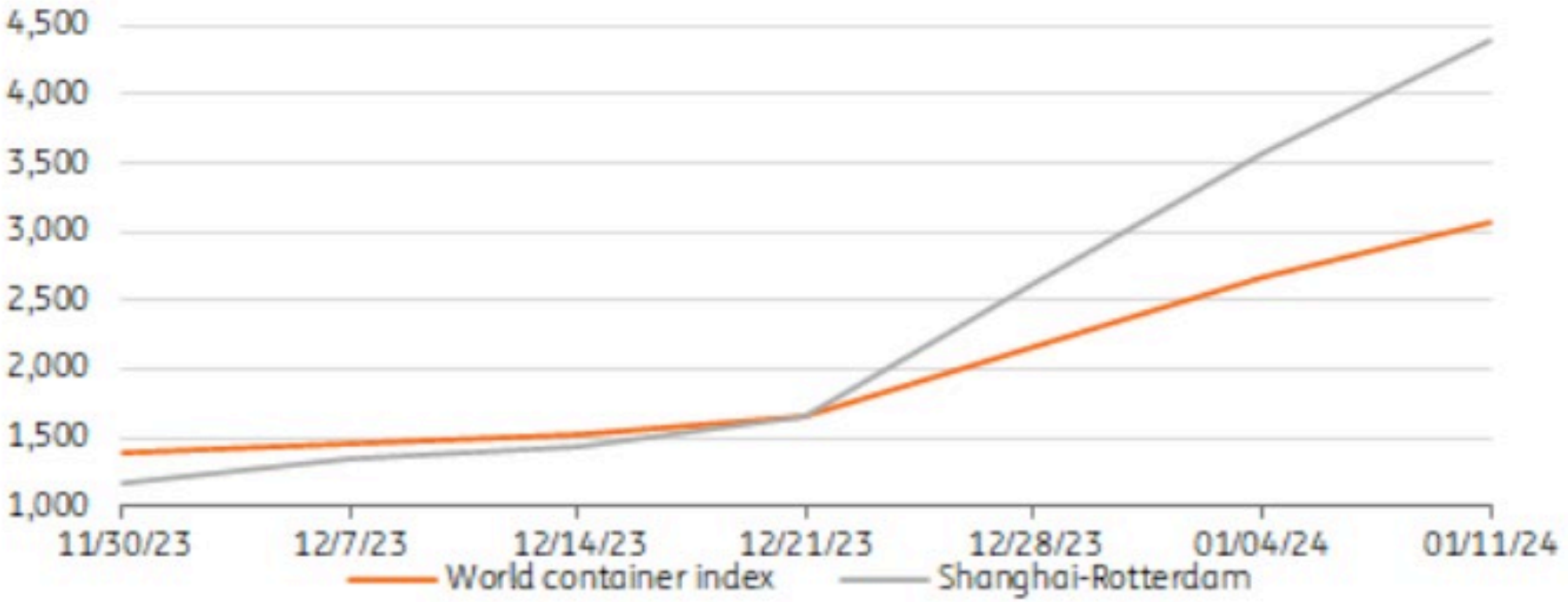
# The new war

- The Suez Canal is a vital passage for 18% of global trade.
- 20% of the world's oil and 25% of LNG (liquified natural gas) goes through here
- 40% of Europe-Asia trade passed through the Red Sea
- The alternative route costs around $1 million extra in fuel costs

# Shipping Route avoiding the Red Sea

# Container rates to Europe have risen rapidly since Red Sea troubles started

World container index (WCI), freight rates in $ per FEU (40 ft container)



# Shipping Route avoiding the Red Sea

- Over 200 container ships travelled through the Red Sea from January 4th and 11th 2023.
- The same week in 2024 102 did.
- Container lines struggle to rent enough ships for the lengthened journeys their vessels must now take.
- It adds some 3,500 nautical miles to the journeys.
- At a speed of 14 knots, this is about 14 days added to the length of the trip.

# The Hidden Semiconductor War

North American semiconductor companies have migrated to the fabless model (Figure 1). The result is that the region is able to design next generation advanced packages but is heavily dependent upon Asian supply for chip manufacturing, IC-substrate production, and IC-packaging.

**Figure 1:** North American capability. Design focus, with outsourced manufacturing. Source: DoD Presentation

# USA vs. China

The USA and China attempt to create alliances with other countries to restrain the others advancement.

They also continue to provide strong incentives for Taiwanese chipmakers to move production elsewhere

Also, the changing politics in Taiwan is angering China and the ‘one country’ debate intensifies.

# Top Fabricators of Chips

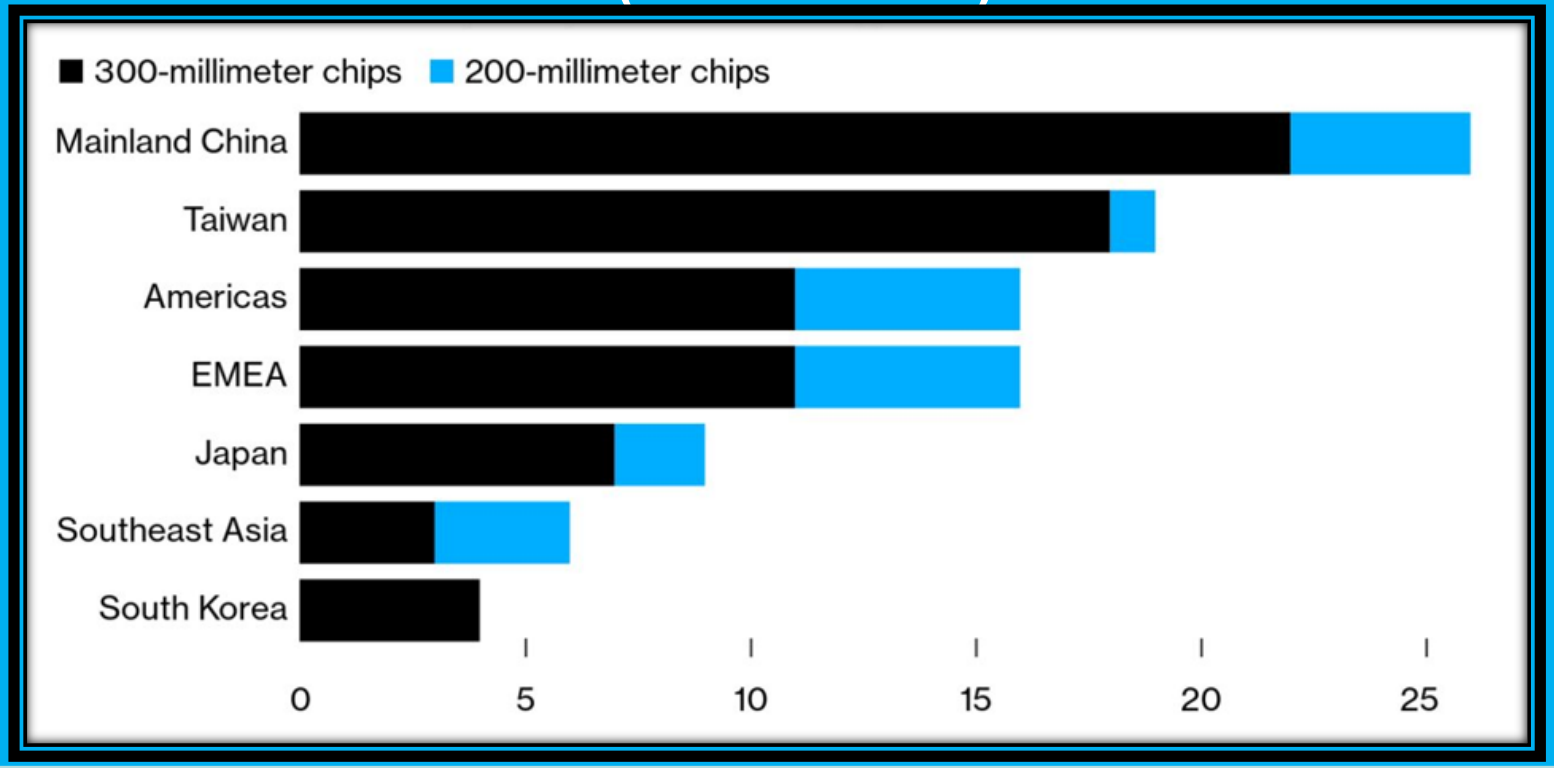
## by Market Share

| Company | Market share | Country |
|---|---|---|
| TSMC | 54% | Taiwan |
| Samsung | 17% | South Korea |
| UMC | 7% | Taiwan |
| GlobalFoundries | 7% | U.S. |
| SMIC | 5% | China |
| HH Grace | 1% | China |
| PSMC | 1% | Taiwan |
| VIS | 1% | Taiwan |
| DB HiTek | 1% | China |
| Tower Semiconductor | 1% | Israel |
| Other firms | 5% | N/A |

Source: Visual Capitalist

- The Semi market is projected to grow from $452B in 2021 to $803B in 2028 a CAGR of 8.6%
- Every projection until now has been below what happened
- We are at the start of dramatic growth, EV, auto, 5G, fibre, and consumer

# New Chip Plants Under Construction
## (2022 - 2026)




Source: SEMI World Fab Forecast

# Top issues facing the semiconductor industry over the next three years

(From the top 30 manufacturers)

1. 53%, Territorialism/nationalism. (cross border regulation, tariffs, new trade and/or national security policies)
2. 37%, Supply chain disruption.
3. 30%, Talent risk. (not enough skilled workers, war for talent)

Company Confidential

# Reshoring or Nearshoring, (from cases reported by country)

| Rank | Country | Jobs | Cases | Average Jobs/Case | % of Total Jobs |
|---|---|---|---|---|---|
| 1 | Asia | 18,108 | 83 | 219 | 36% |
| 2 | Western Europe | 1,265 | 14 | 92 | 3% |
| 3 | Eastern Europe | 483 | 5 | 105 | 1% |
| 4 | North America | 368 | 5 | 80 | 1% |
| 5 | Middle East | 0 | 0 | 0 | 0% |
| 6 | South/Central America | 0 | 0 | 0 | 0% |
| 7 | Australia/Oceania | 0 | 0 | 0 | 0% |
| 8 | Africa | 0 | 0 | 0 | 0% |

Source: The Reshoring Initiative

# The Components of GDP

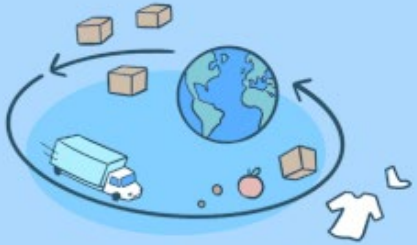
**Personal Consumption Expenditures**

- Goods can be durable (cars, furniture, large appliances) or non-durable (clothing, food, fuel)
- Services include banking, health care, and education

**Business Investment**

- Divided into two sub-components: fixed investment and change in private inventory

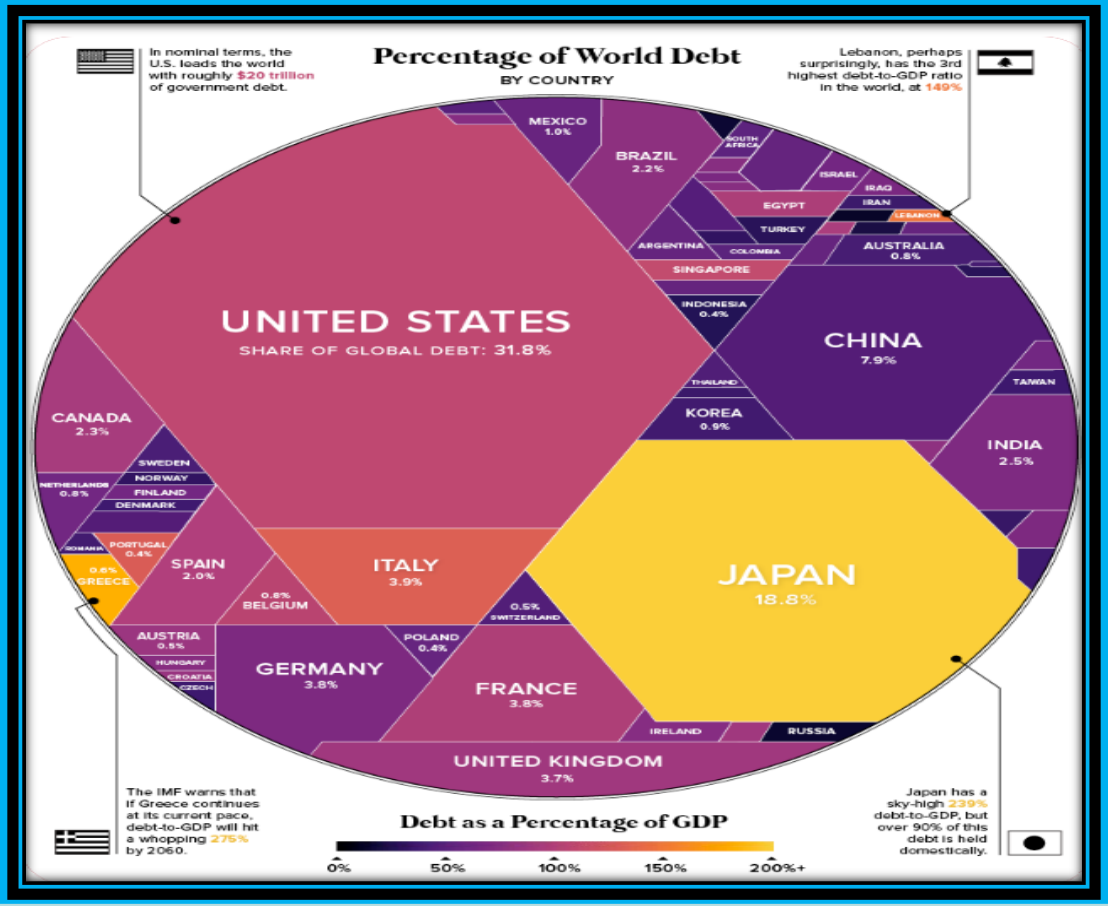
**Government Spending**



**Net Exports of Goods and Services**

the balance

# Global Debt 2023




Source: Visual Capitalist

# Global $105 Trillion Economy 2023
# Top 10 Countries by GDP

| Rank | Country | GDP (USD) | % of Total |
|---|---|---|---|
| 1 | U.S. | $26,855B | 25.54% |
| 2 | China | $19,374B | 18.43% |
| 3 | Japan | $4,410B | 4.19% |
| 4 | Germany | $4,309B | 4.10% |
| 5 | India | $3,737B | 3.55% |
| 6 | UK | $3,159B | 3.00% |
| 7 | France | $2,923B | 2.78% |
| 8 | Italy | $2,170B | 2.06% |
| 9 | Canada | $2,090B | 1.99% |
| 10 | Brazil | $2,081B | 1.98% |

Source: Visual Capitalist

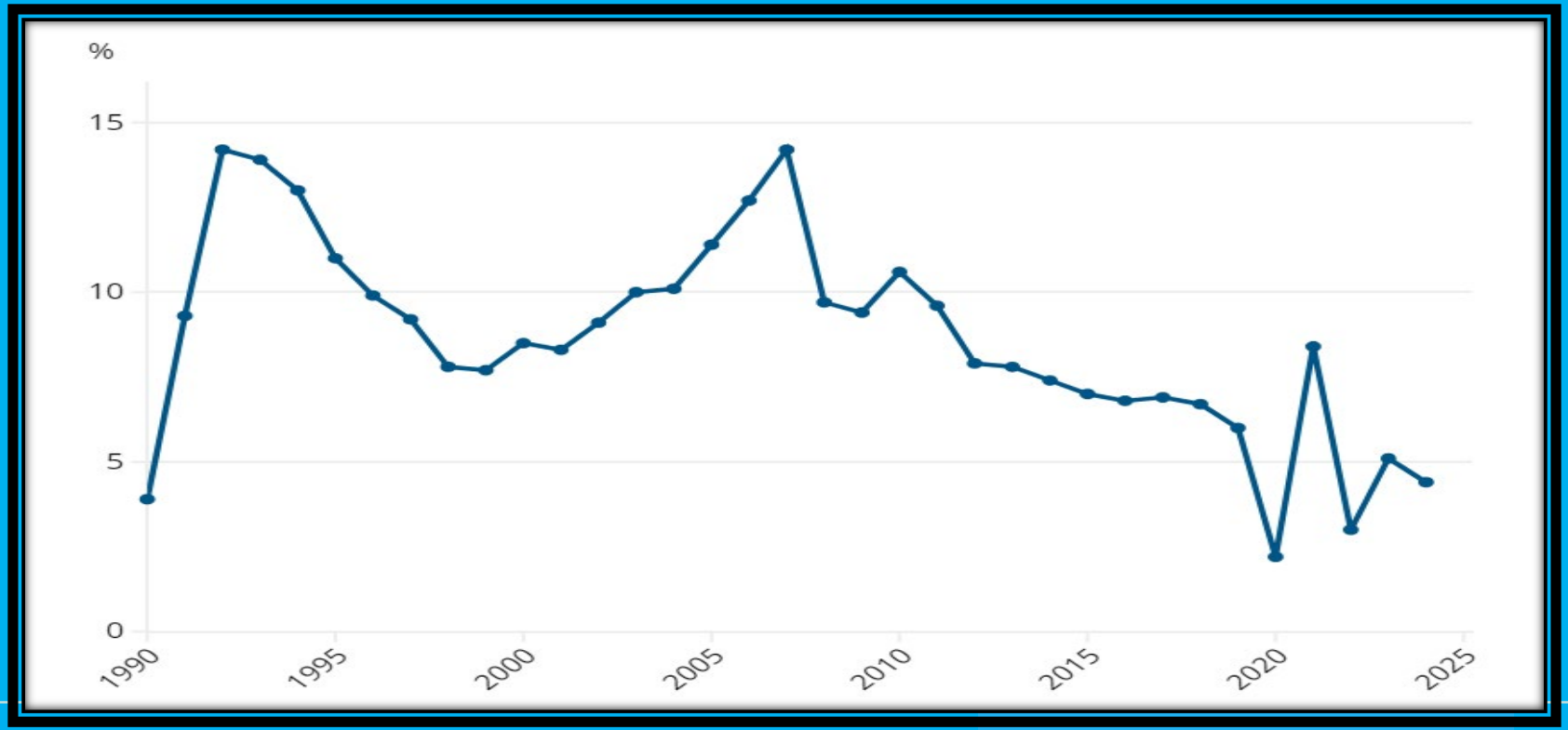
# Real GDP Growth

## Real Rates of Economic Growth

| Region | 2020 | 2021 | 2022 | 2023 | 2024F |
|---|---|---|---|---|---|
| World | -3.0 | 6.0 | 3.5 | 3.0 | 2.9 |
| USA | -3.4 | 5.7 | 2.1 | 2.0 | 1.8 |
| Euro Area | -6.5 | 5.2 | 3.3 | 0.7 | 1.0 |
| Japan | -4.6 | 1.7 | 1.0 | 1.8 | 1.0 |
| China | 2.2 | 8.1 | 3.0 | 5.0 | 4.3 |
| Emerging and Developing Asia | -2.6 | 6.6 | 4.5 | 5.2 | 4.9 |

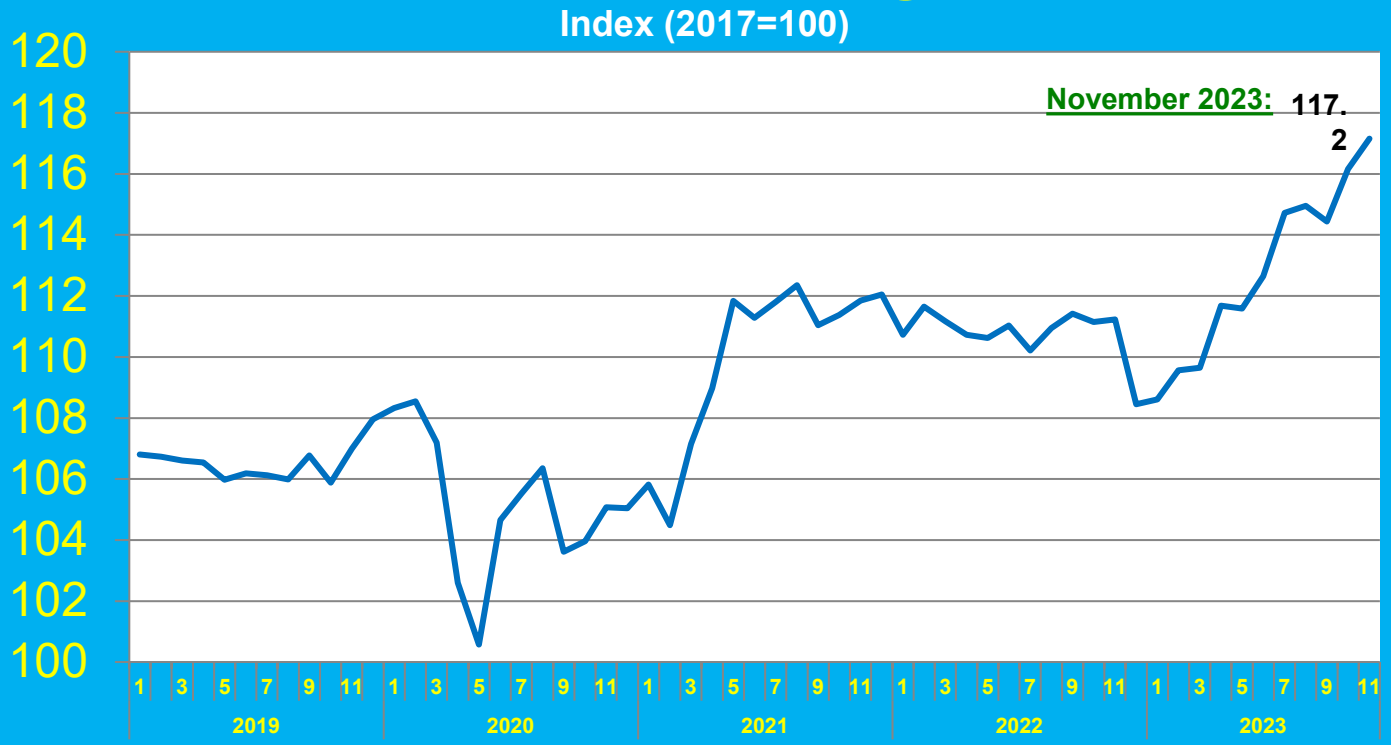
Source: Custer and IMF

# China's Economic Growth
## (GDP growth – annual %)




Source: World Bank

# U.S. Computer & Electronic Products Manufacturing




Source: FRED

# Purchasing Managers Indices (PMI)

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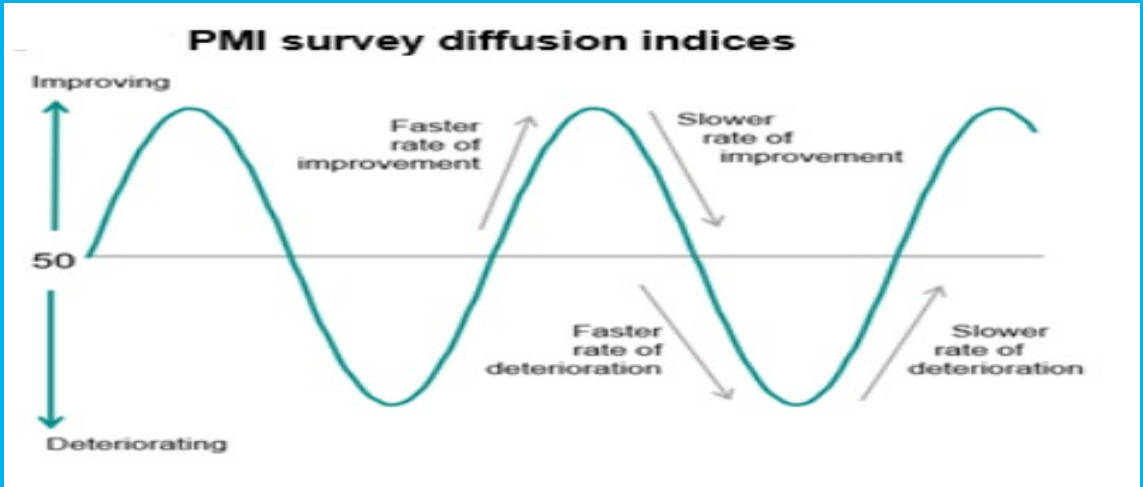
## Interpreting The Manufacturing PMI

PMI surveys ask respondents to report on monthly changes in key business metrics, such as production, new orders, employment and prices.

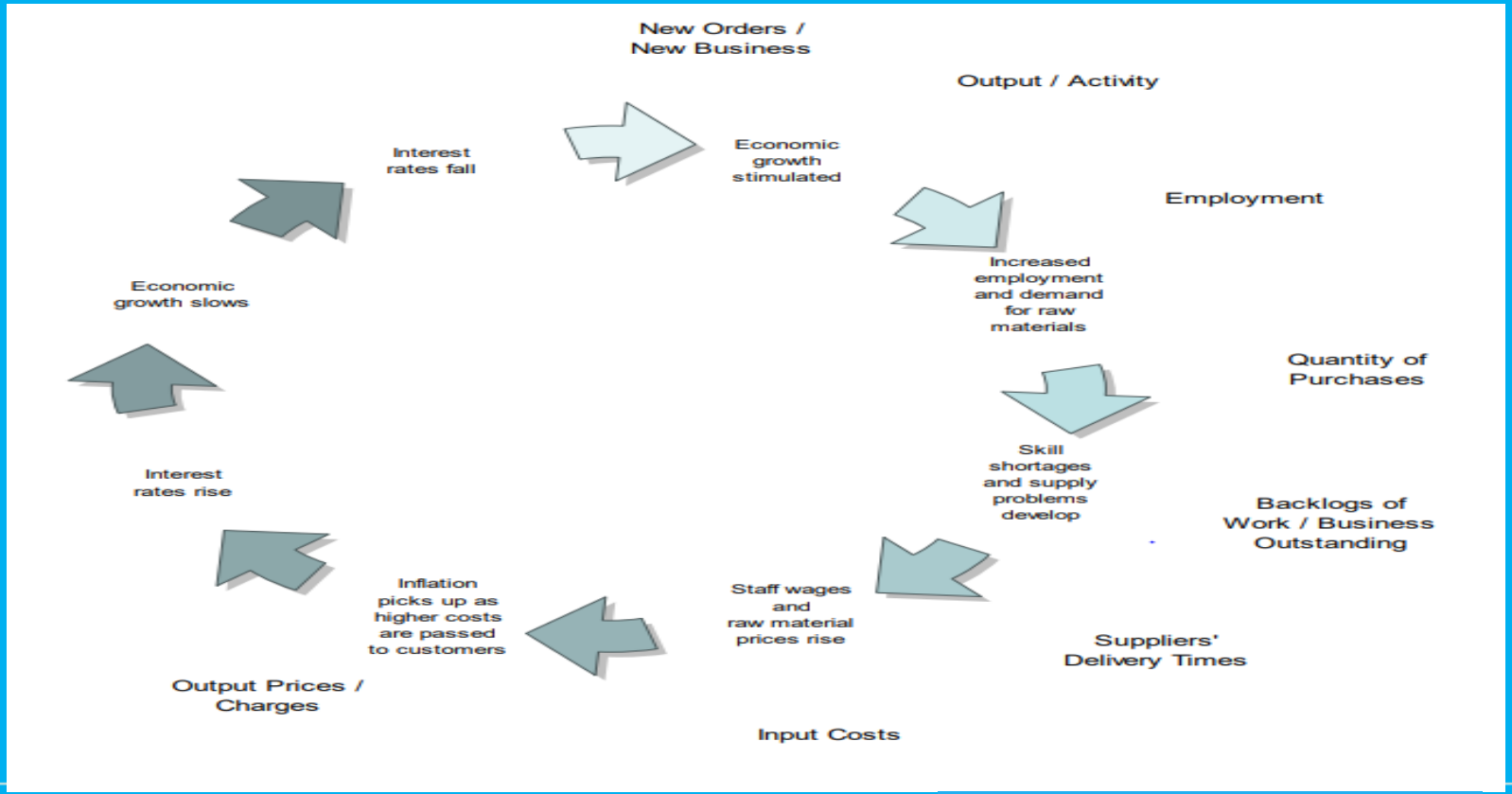
The percentage of respondents reporting an increase are assigned a weight of 1.0 and those reporting no change are accorded a weight of 0.5. Those reporting a decline are weighted zero. Therefore, if 100% of the survey panel reports an increase, the resulting index hits 100. Similarly, if 100% of companies report no change, the index comes in at 50.0 (100% x 0.5).




Source: Markit Economics

# Purchasing Managers Indices (PMI)

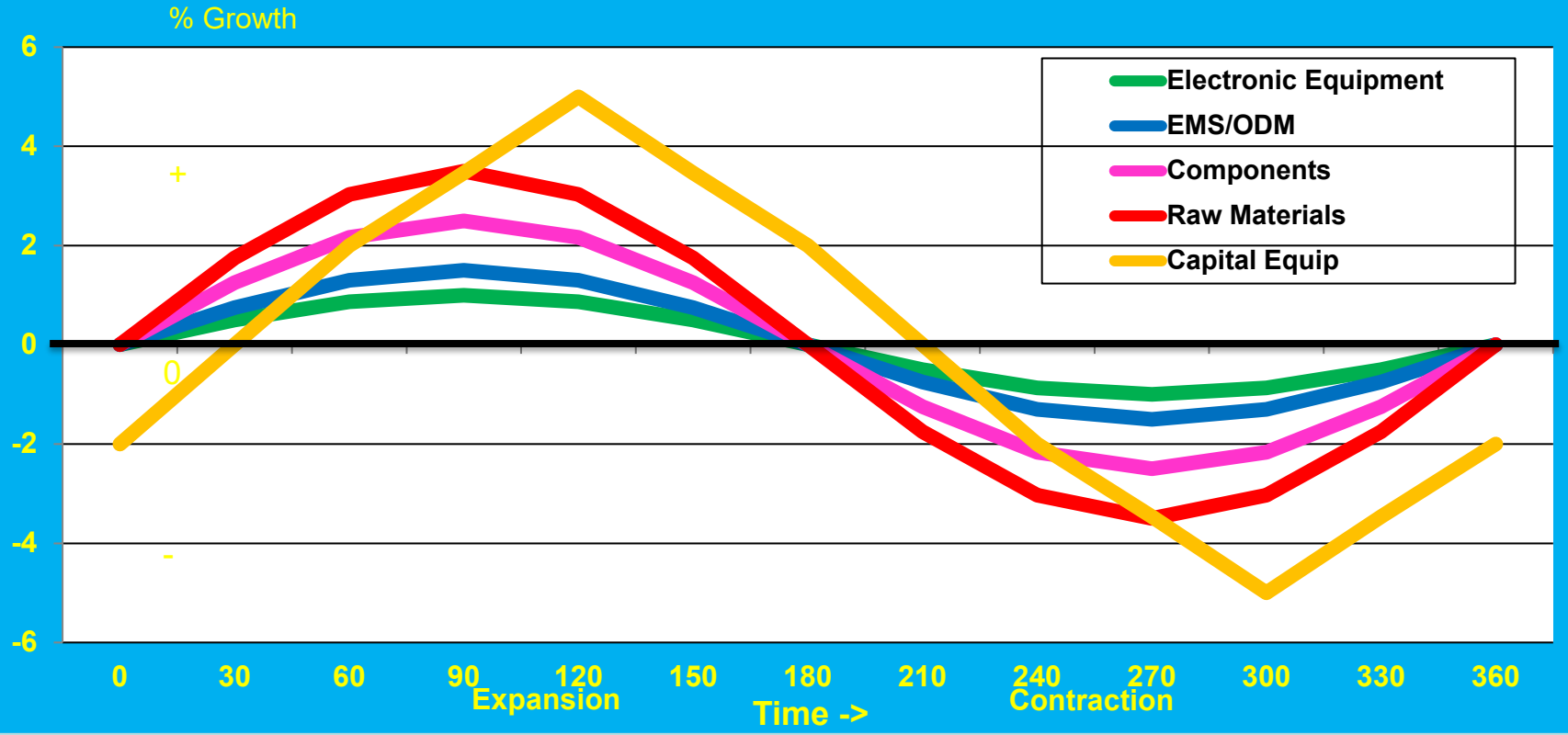
## Boom-bust cycle with PMI Variables



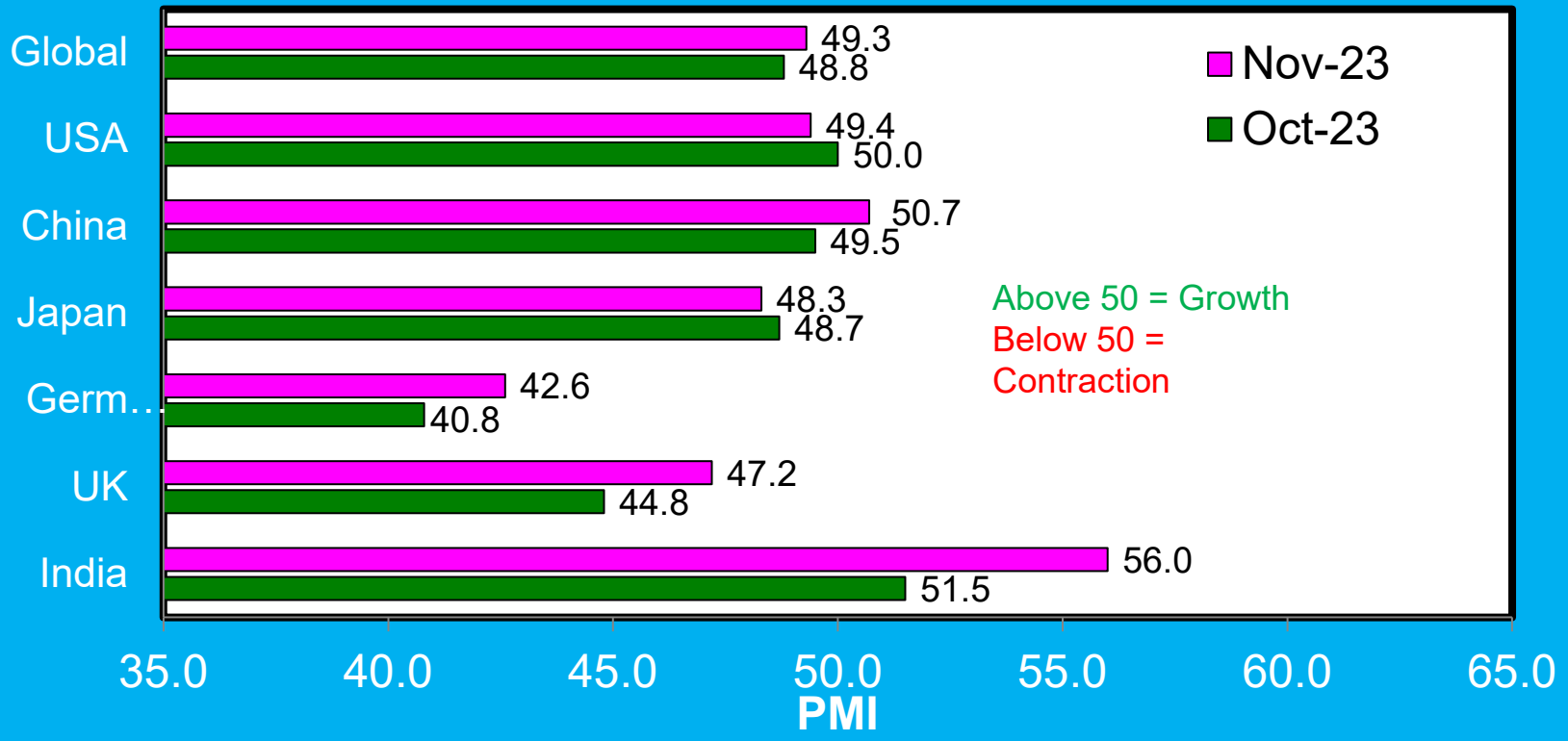

Source: Markit Economics

# BUSINESS CYCLE 2023

## Electronic Equipment, EMS/ODM Companies, Components, Materials & Capital Equipment



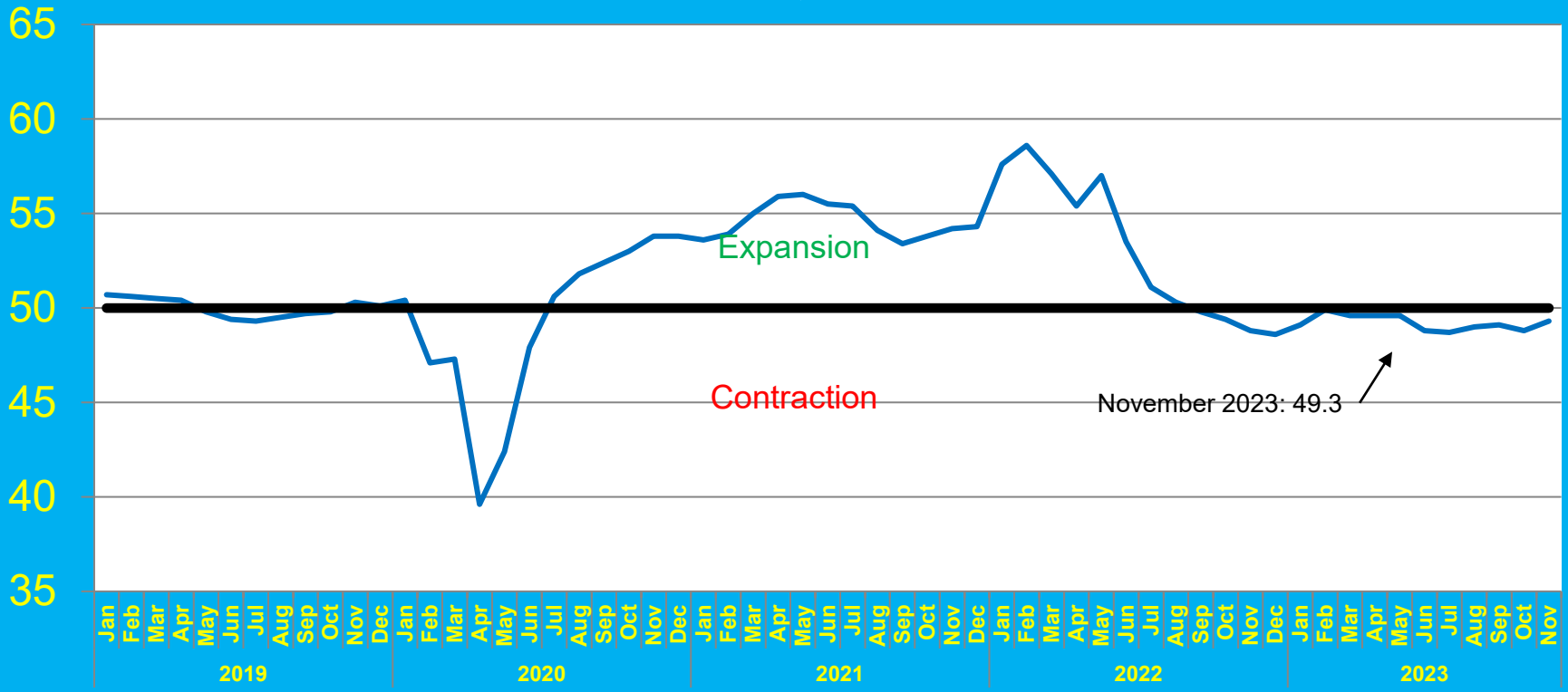
# Purchasing Managers' Indices
## November vs. October, 2023




Source: Markit Economics

# Global "Purchasing Managers" Index

## Diffusion Index, >50 = Growth




Source: Markit Economics

# Global Manufacturing PMI – November 2023

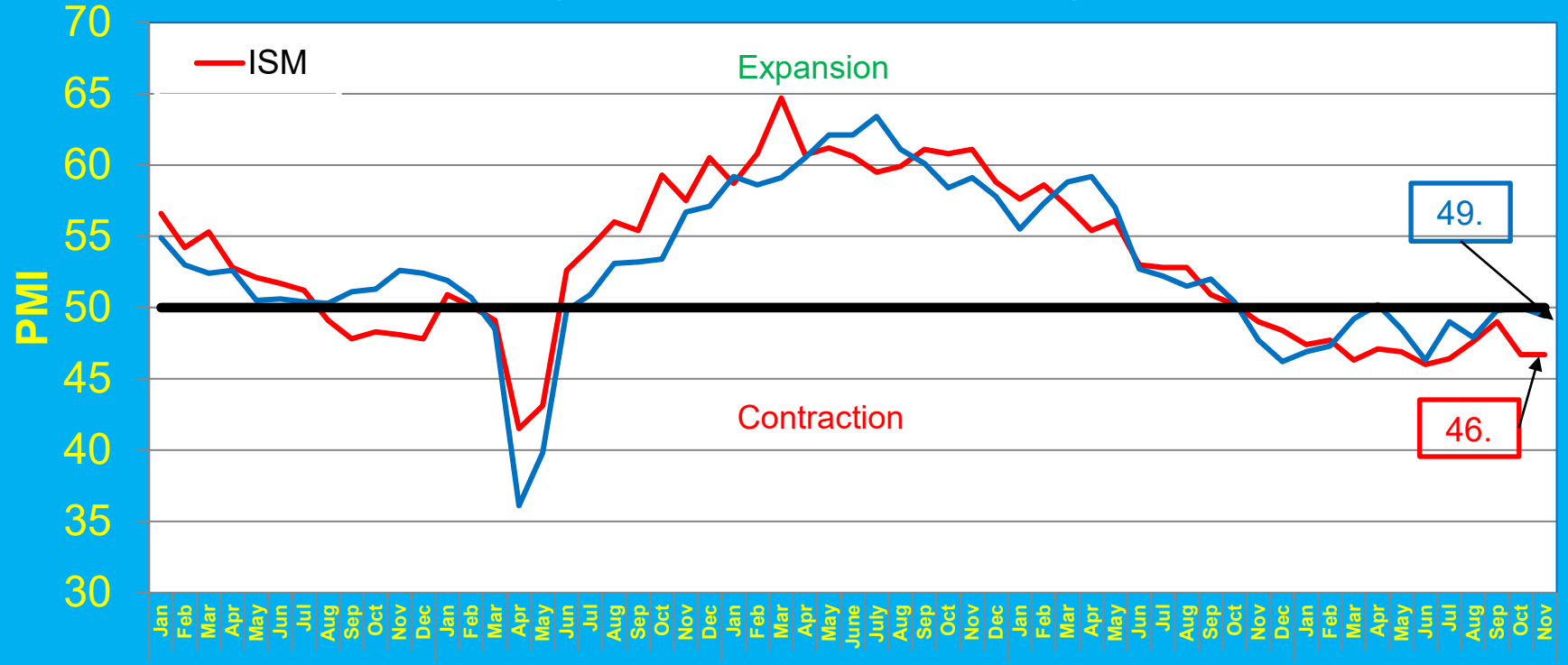
- The composite index rose to a six-month high of 49.3 in November, up from 48.8 in October, but remaining below the 50.0 mark for the fifteenth month in a row.
- November data indicated that output contracted for the sixth month in a row (albeit at a slower pace). In contrast, consumer and investment goods producers both saw increases.
- Ten out of the 31 nations for which November PMI data were available saw expansions of production, including the US, mainland China and India.
- The main blot on the copybook remained Europe, with output contracting across the euro area and the UK. Japan also saw output decline.
- Signs of the manufacturing downturn softening were also seen in the trends in new orders, employment and purchasing during November.

Source: Markit Economics

# U.S. "Purchasing Managers" Indices

## ISM vs. Markit Economics

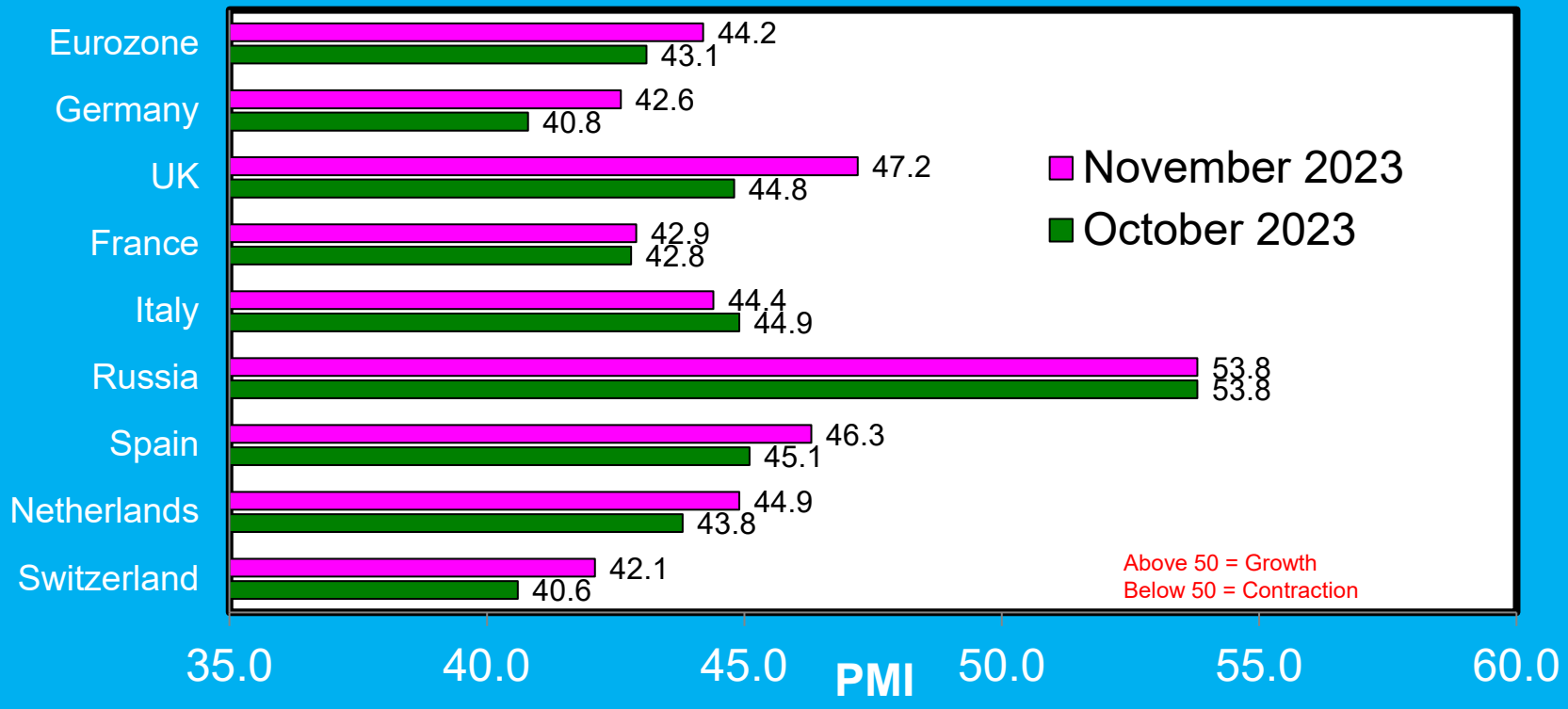
(Diffusion Index, >50 = Growth)




Source: Markit Economics & ISM

# European Purchasing Managers' Indices

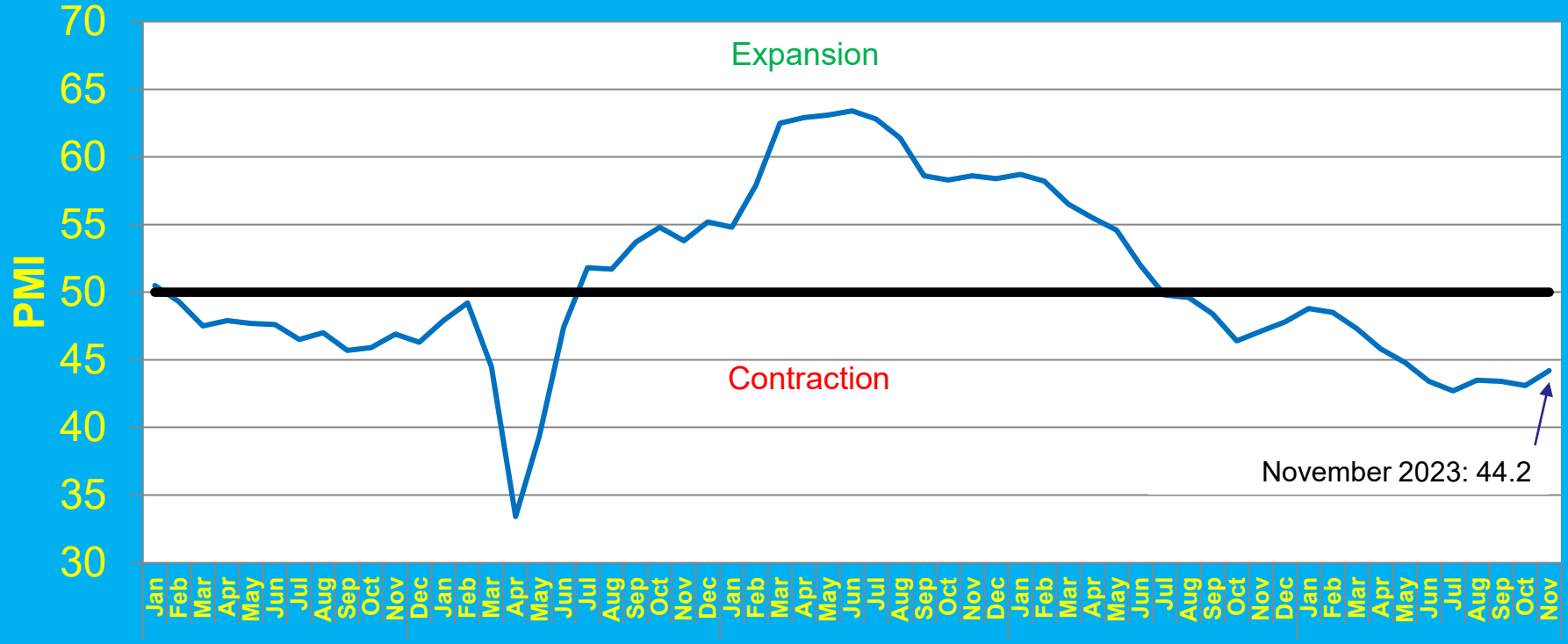
## November vs. October 2023




Source: Markit Economics

# Eurozone Manufacturing "Purchasing Managers" Index

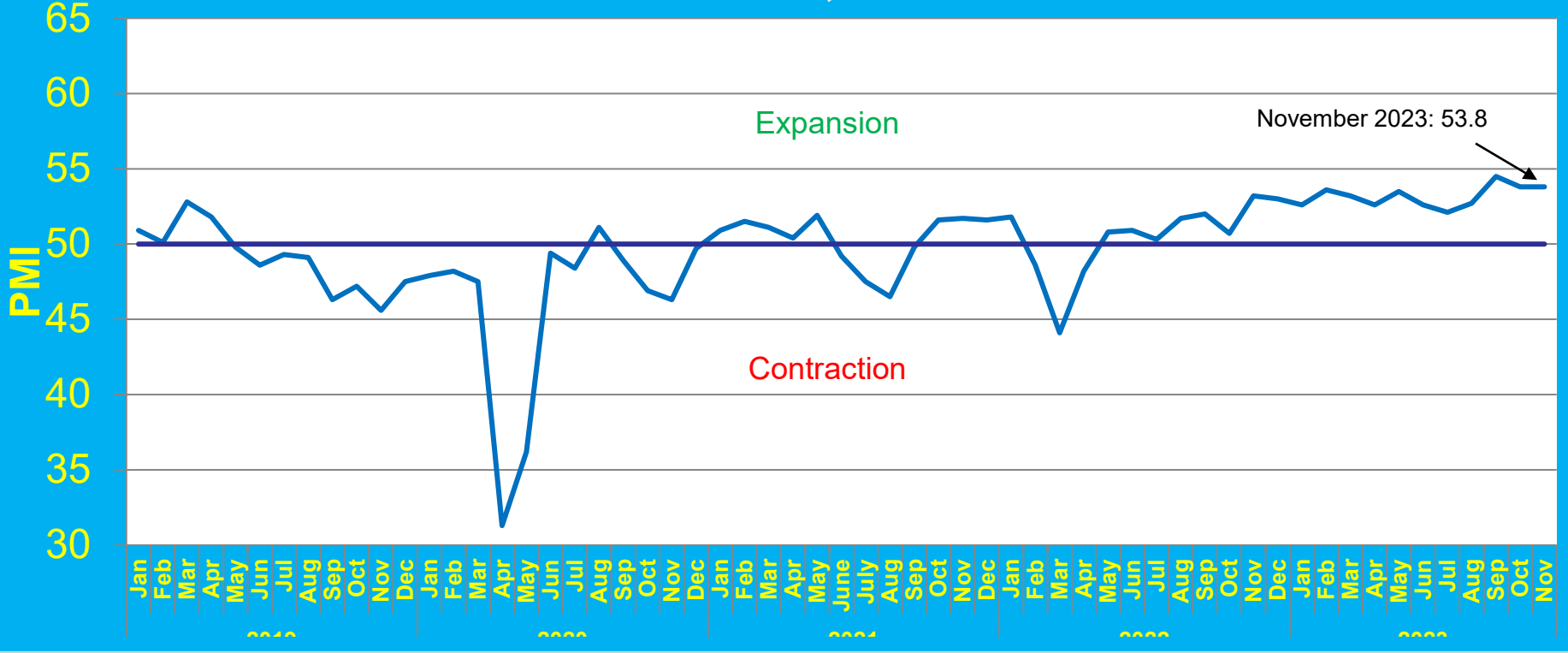
## Diffusion Index, >50 = Growth




Source: Markit Economics

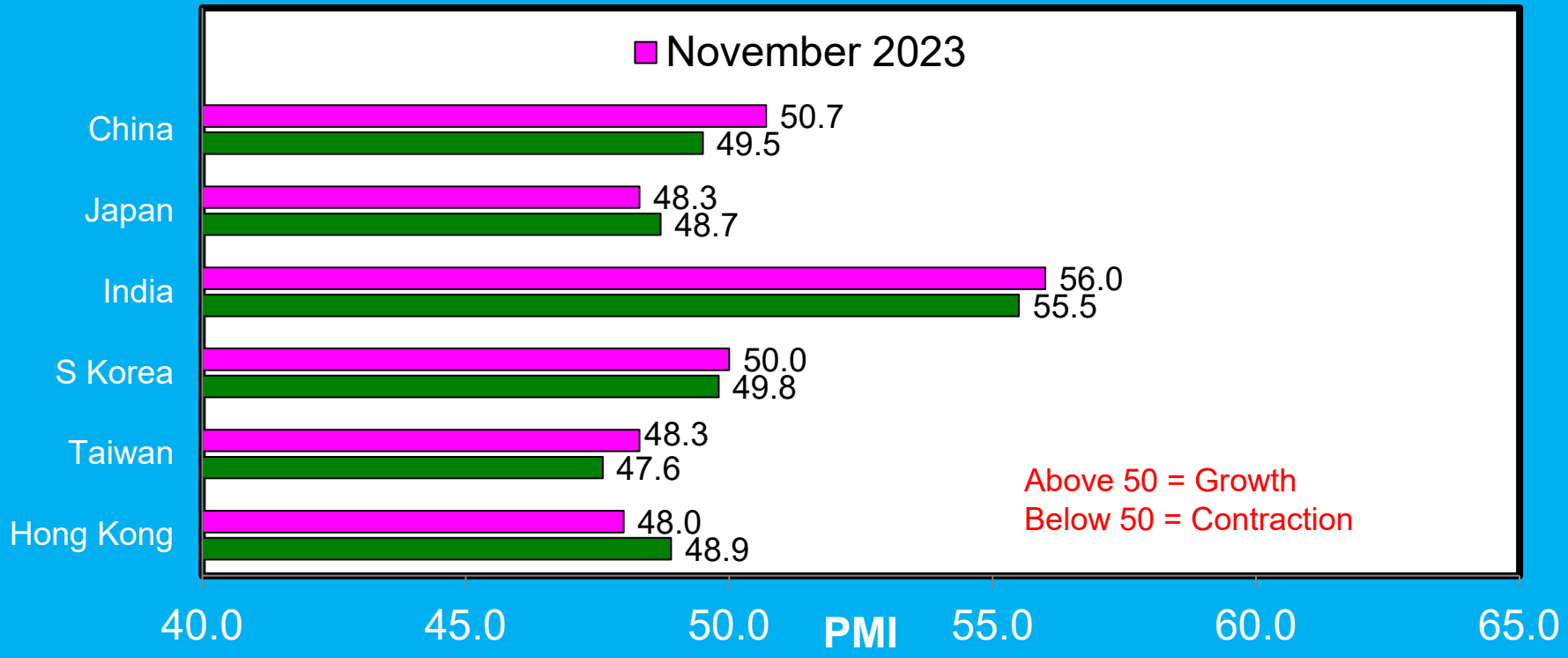
# Russia Manufacturing "Purchasing Managers" Index

## Diffusion Index, >50 = Growth




Source: Markit Economics

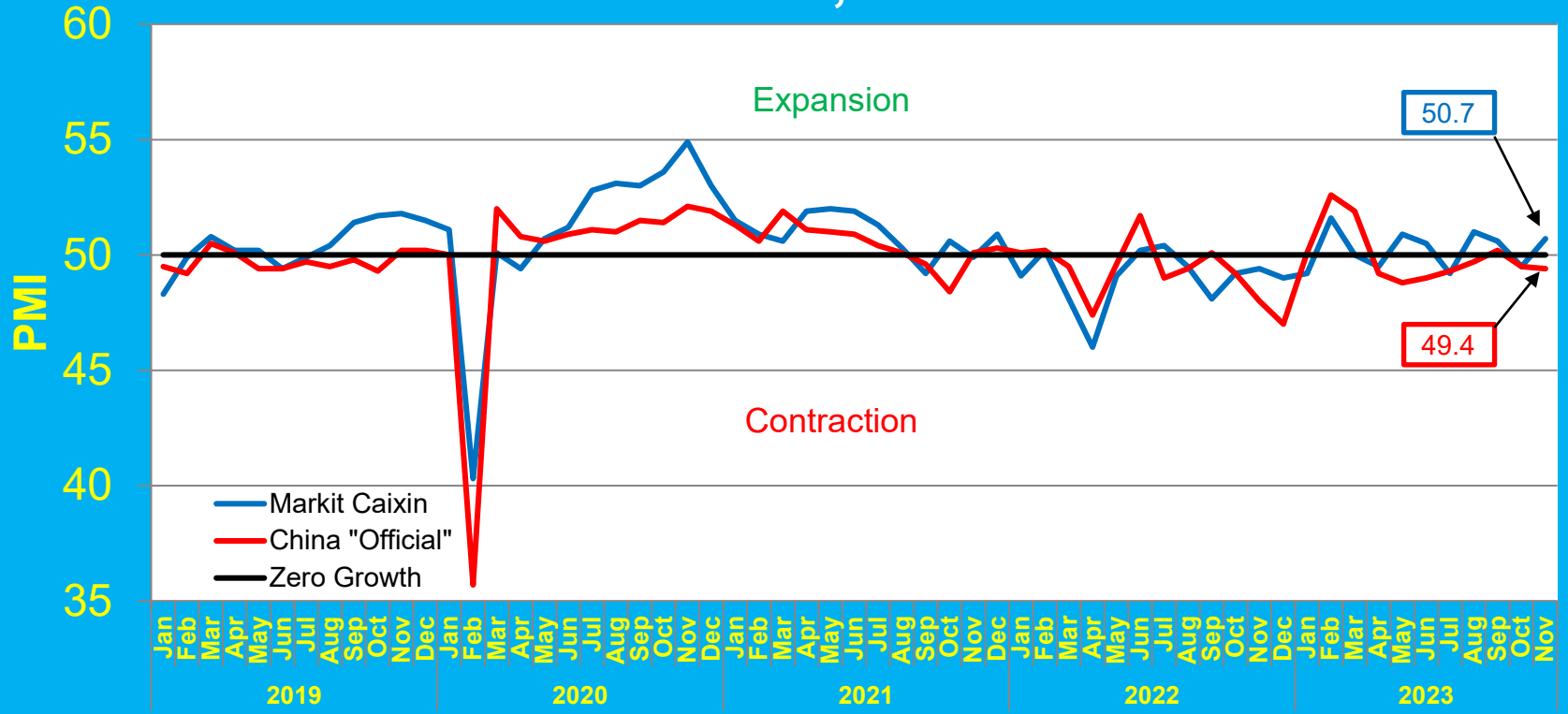
# Asian Purchasing Managers Indices
## November vs. October 2023




Source: Markit Economics

# China "Purchasing Managers" Indices

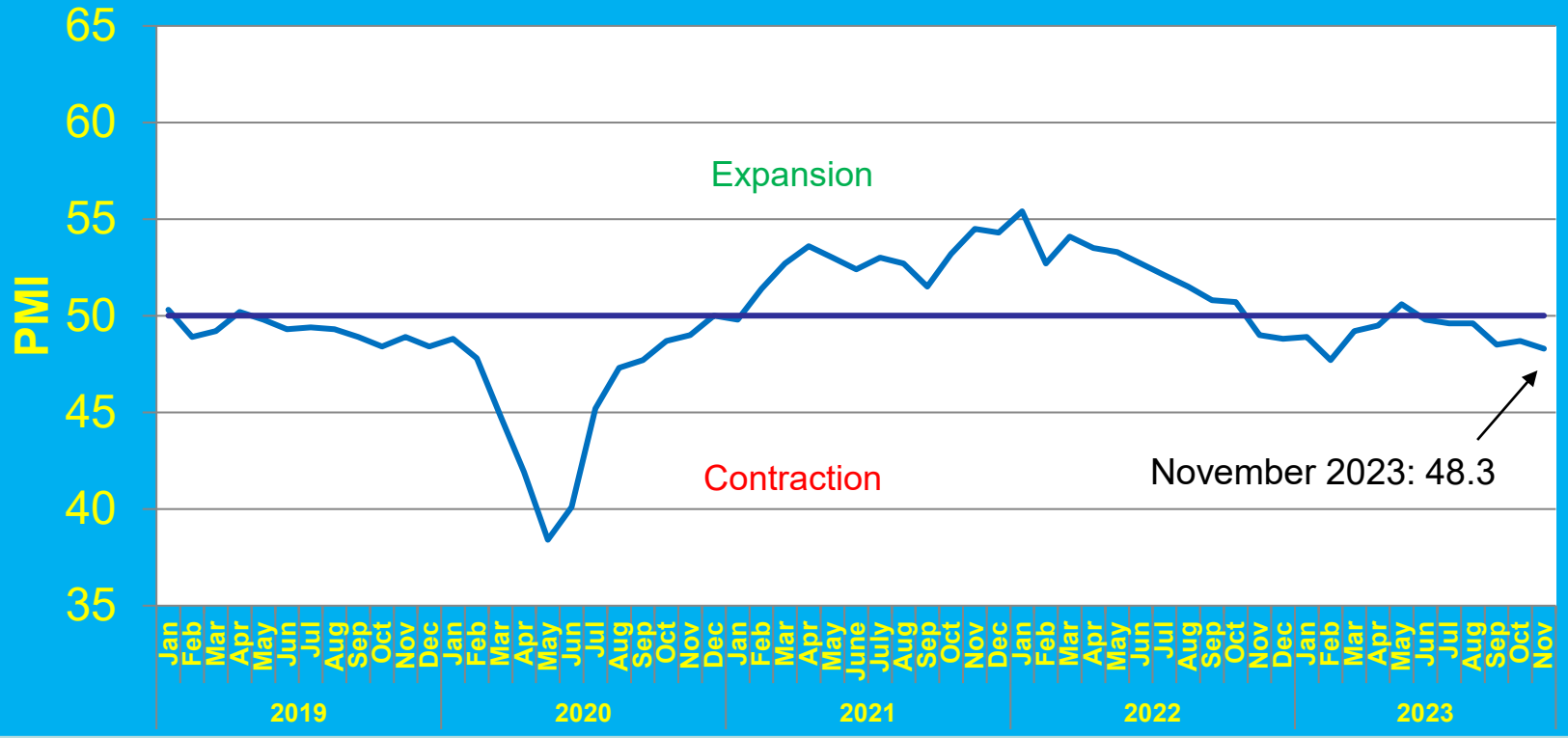
## Diffusion Index, >50 = Growth




Source: Markit Economics, China National Bureau of Statistics

# Japan "Purchasing Managers" Index

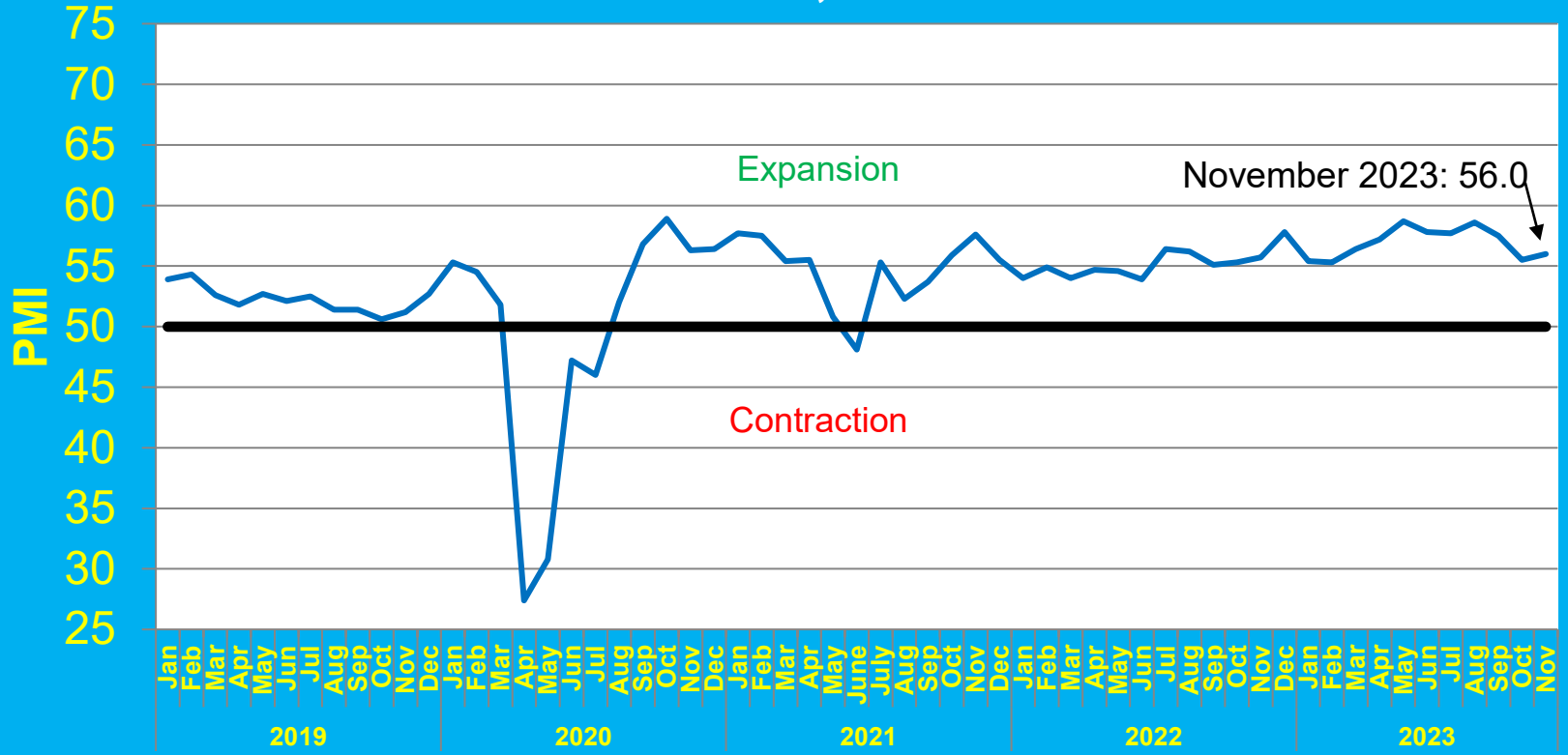
## Diffusion Index, >50 = Growth




Source: Markit Economics

# India "Purchasing Managers" Index

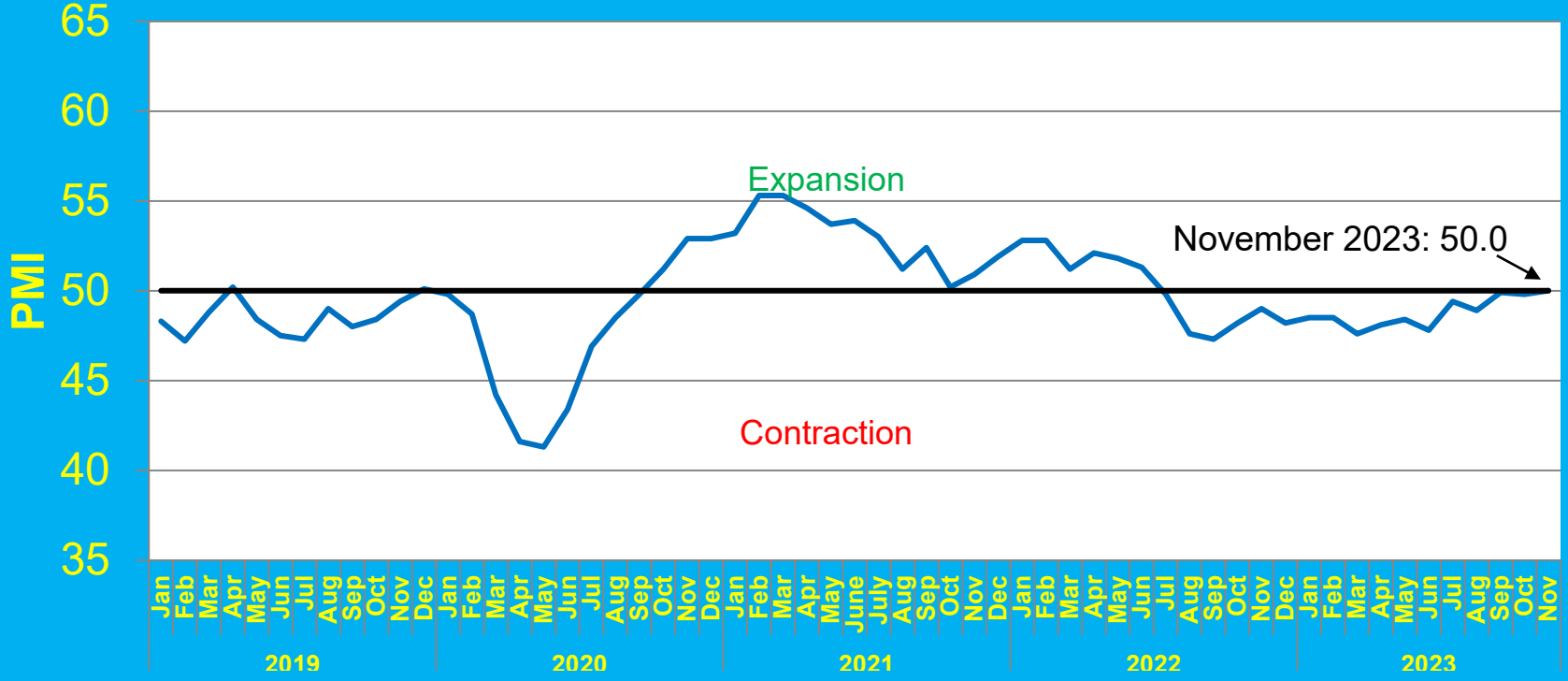
## Diffusion Index, >50 = Growth




Source: Markit Economics

# S. Korea "Purchasing Managers" Index

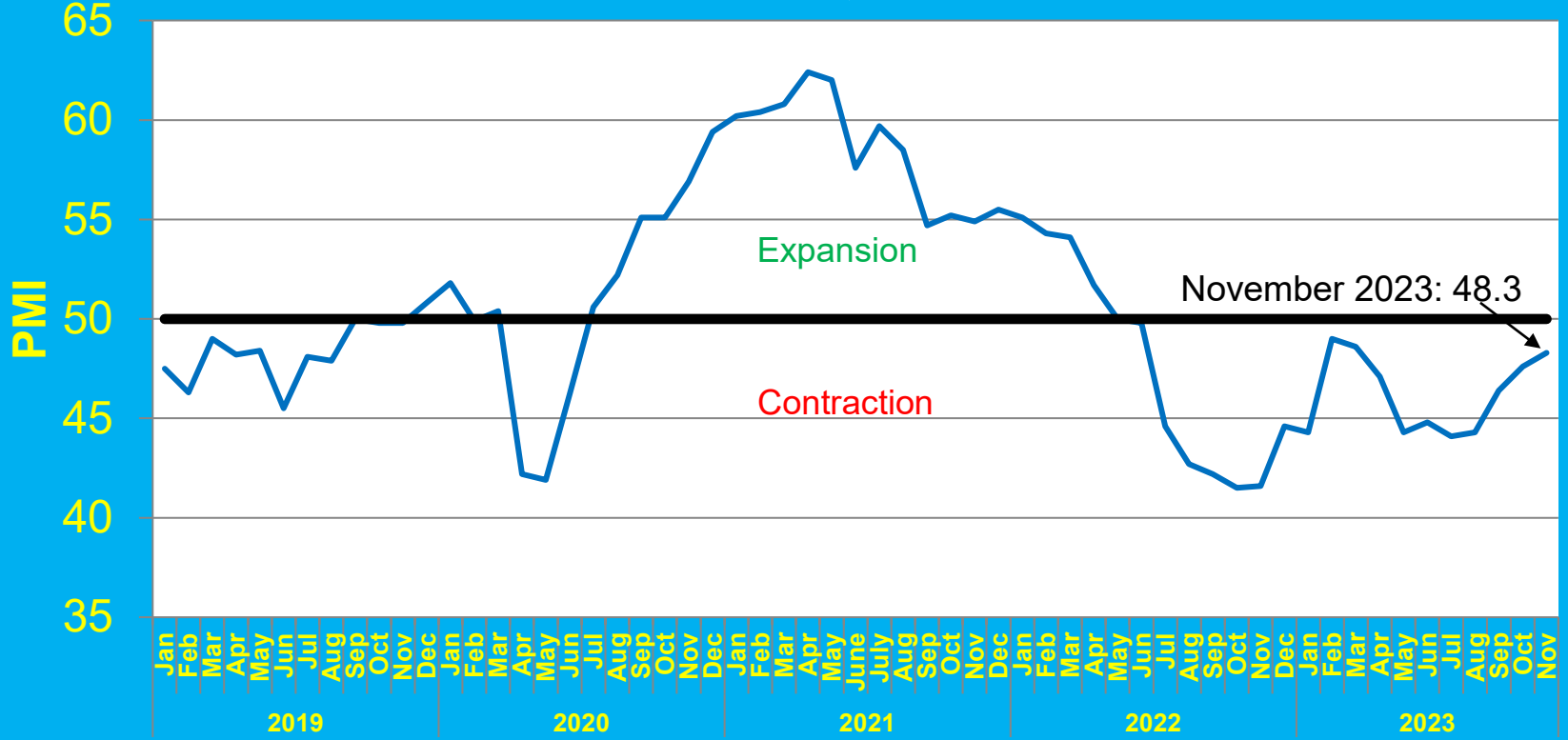
## Diffusion Index, >50 = Growth




Source: Markit Economics

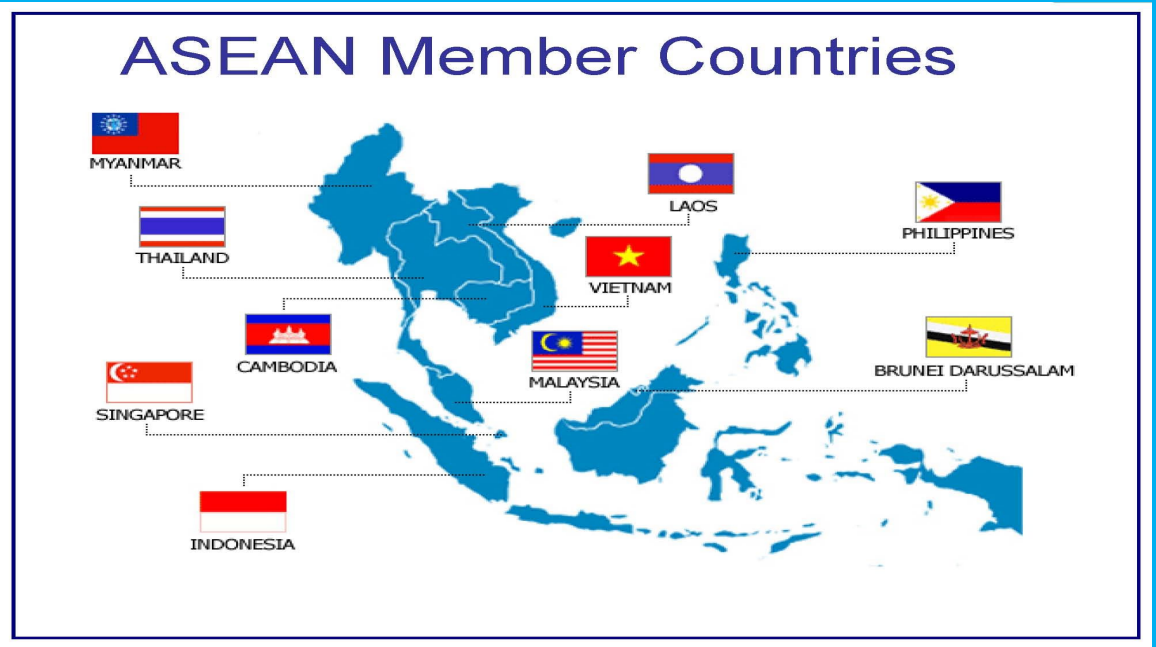
# Taiwan "Purchasing Managers" Index

## Diffusion Index, >50 = Growth




Source: Markit Economics

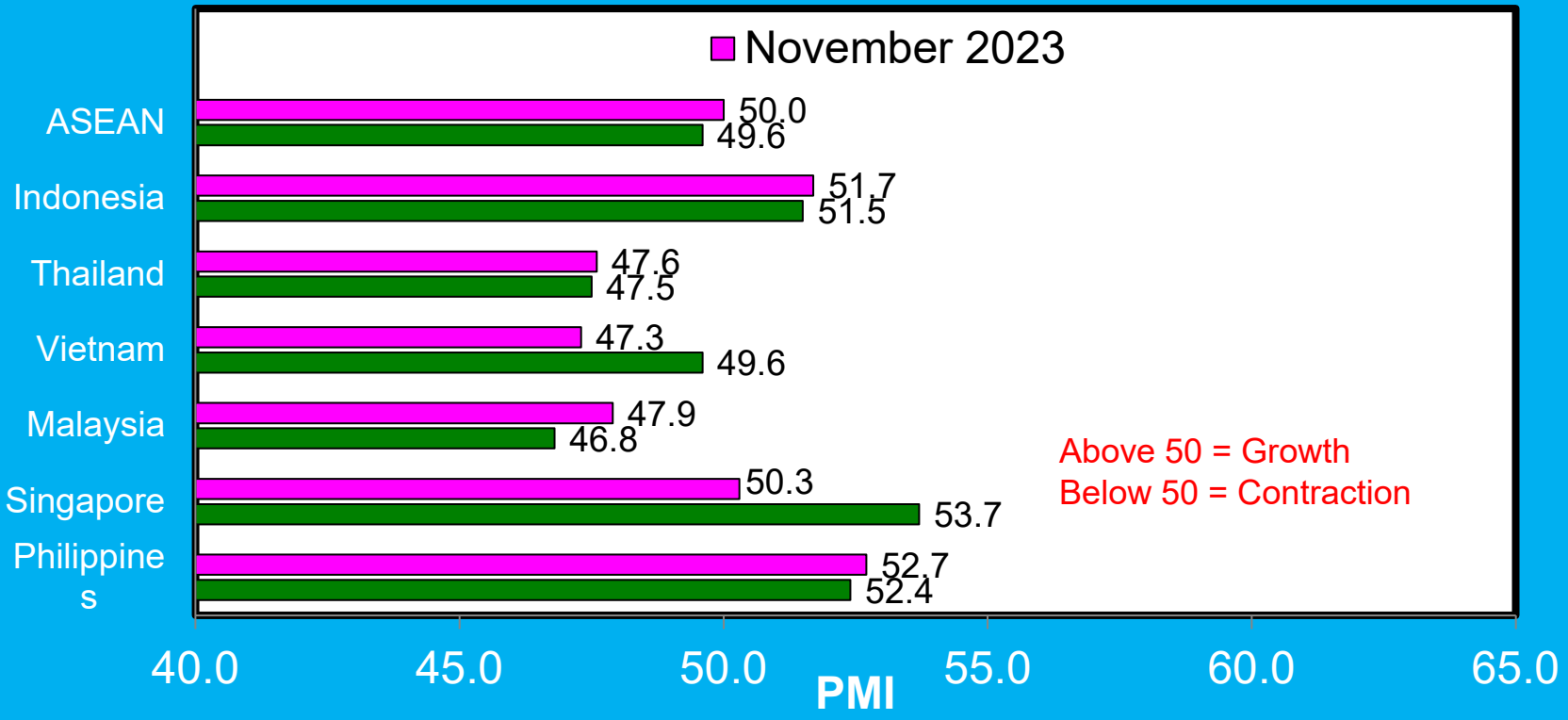
# ASEAN Member Countries




The Association of Southeast Asian Nations, or ASEAN, was **established on 8 August 1967 in Bangkok, Thailand**. There are 10 permanent members of this association. The objective is to promote economic co-operation in South-East Asia and ensure the economic stability in this region.

Source: jagranjosh.com

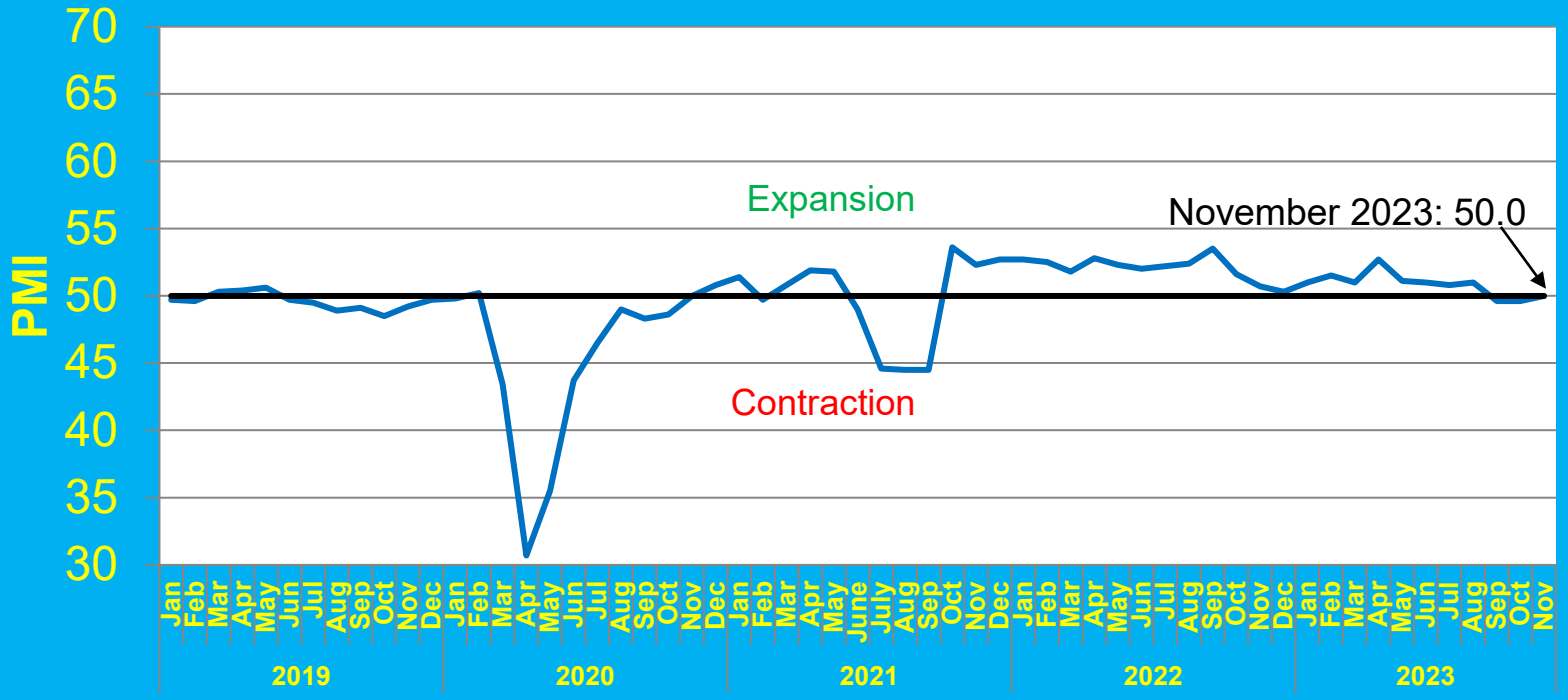
# ASEAN Purchasing Managers Indices
## November vs. October 2023




Source: Markit Economics

# ASEAN "Purchasing Managers" Index

## Diffusion Index, >50 = Growth

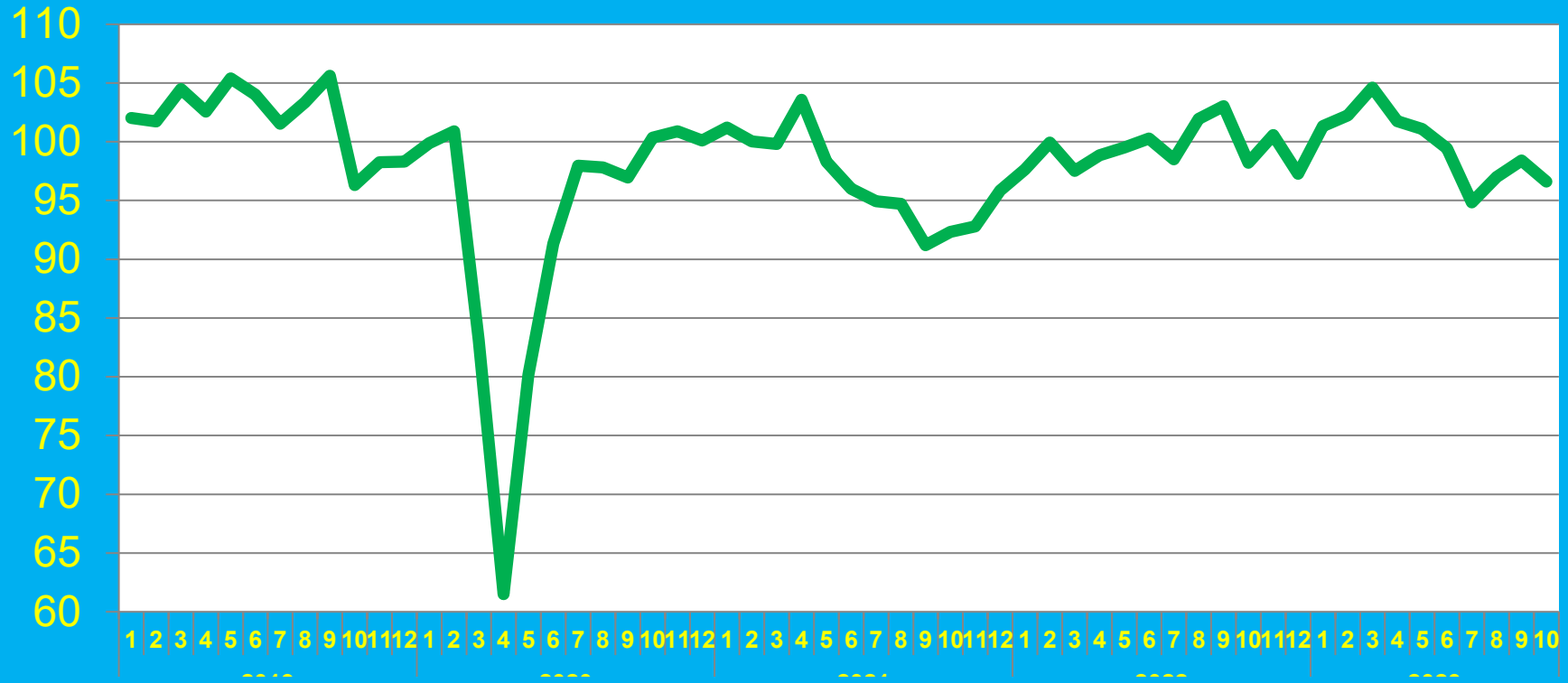



Source: Markit Economics

# Electronic Equipment Market

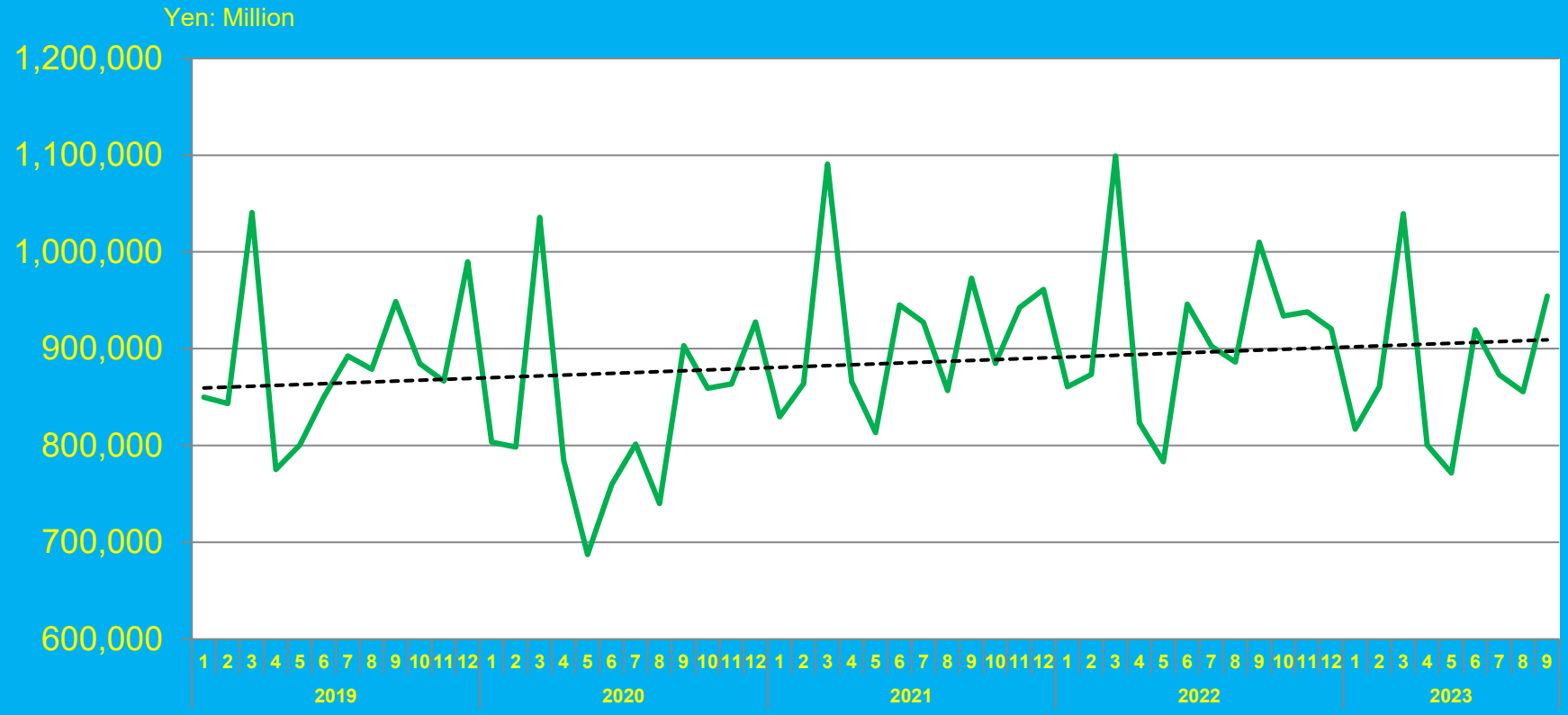
# European Electronic Products Production

Index (2015=100), Seasonally Adjusted



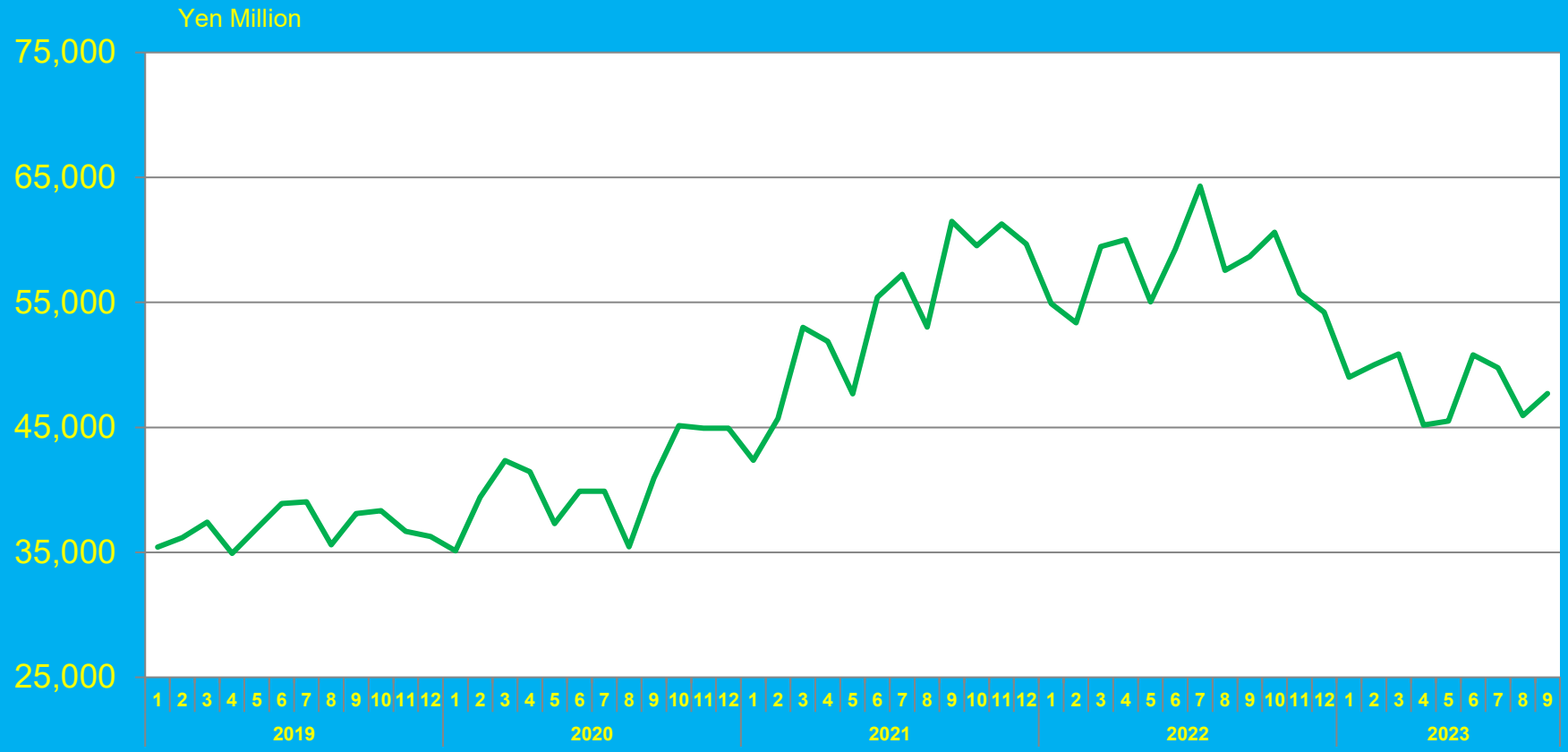

Source: Eurostat, Average of C263, C2651, C266, C2751 & C291
Communication, Instruments, electromedical, domestic appliance, motor vehicles

# Japan Electronic Equipment Production




Source: JEITA

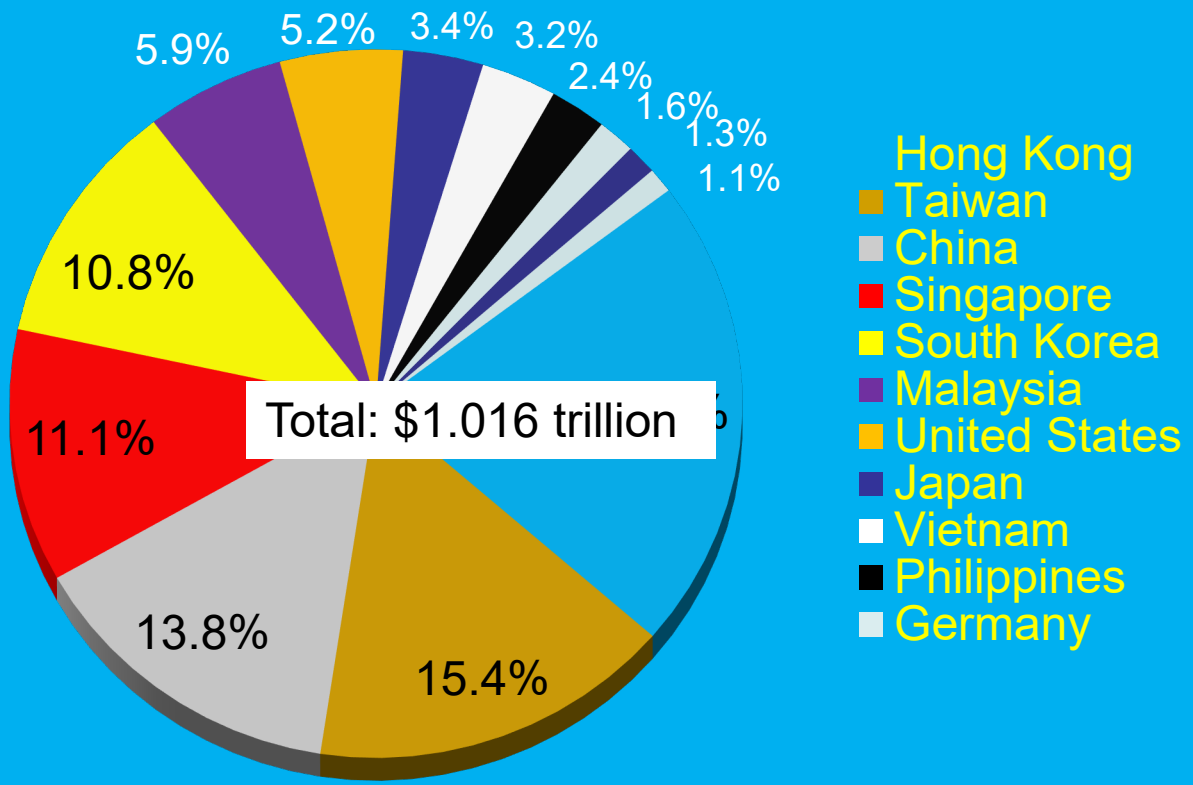
# Japan Electronic Circuit Board Production




Source: JEITA

# Electronics Circuit Component Exports by Country

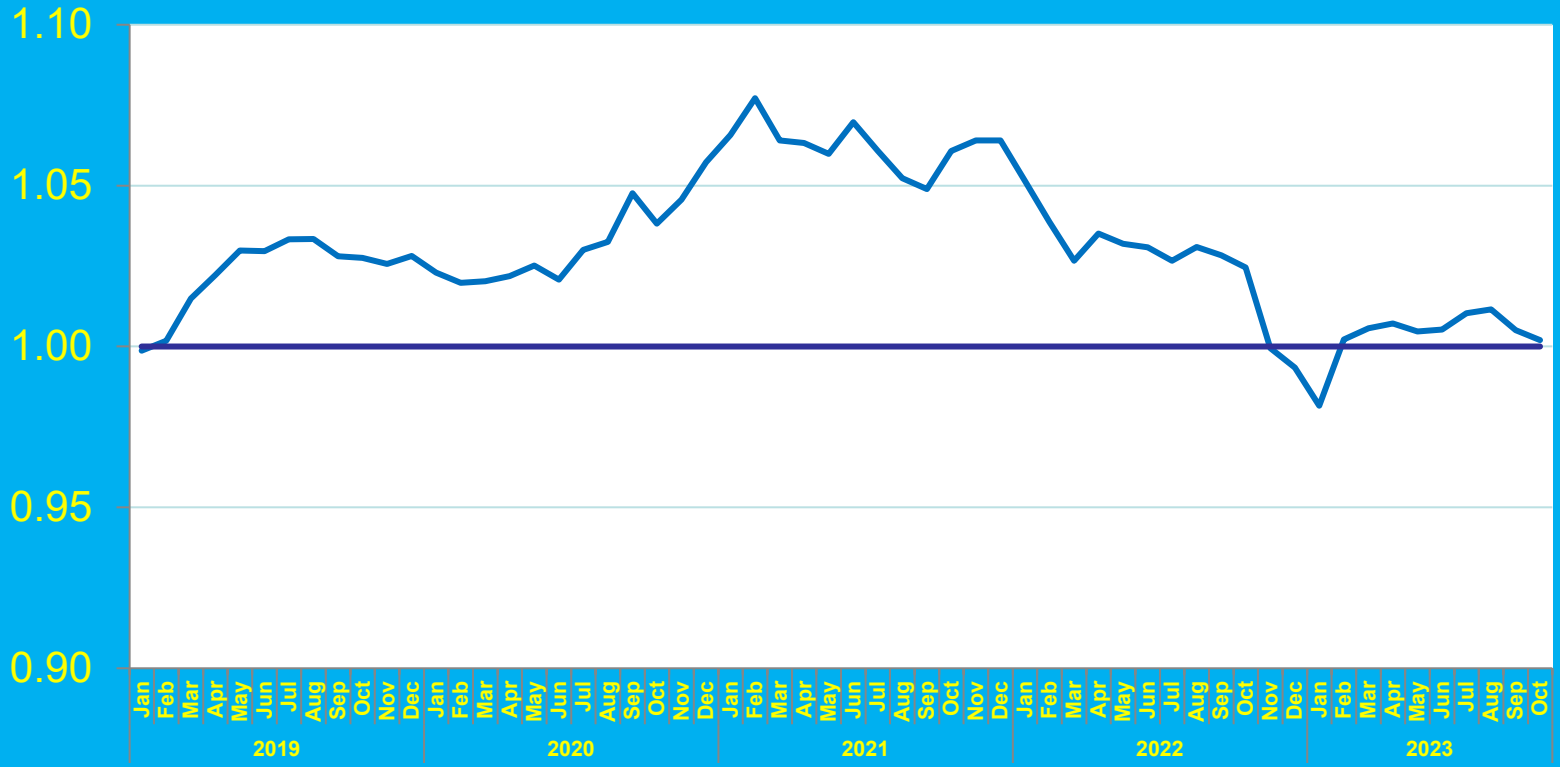
## (2022)




Source: ExportsNews

# U.S. Electronic Equipment - Orders, Shipments & Inventories

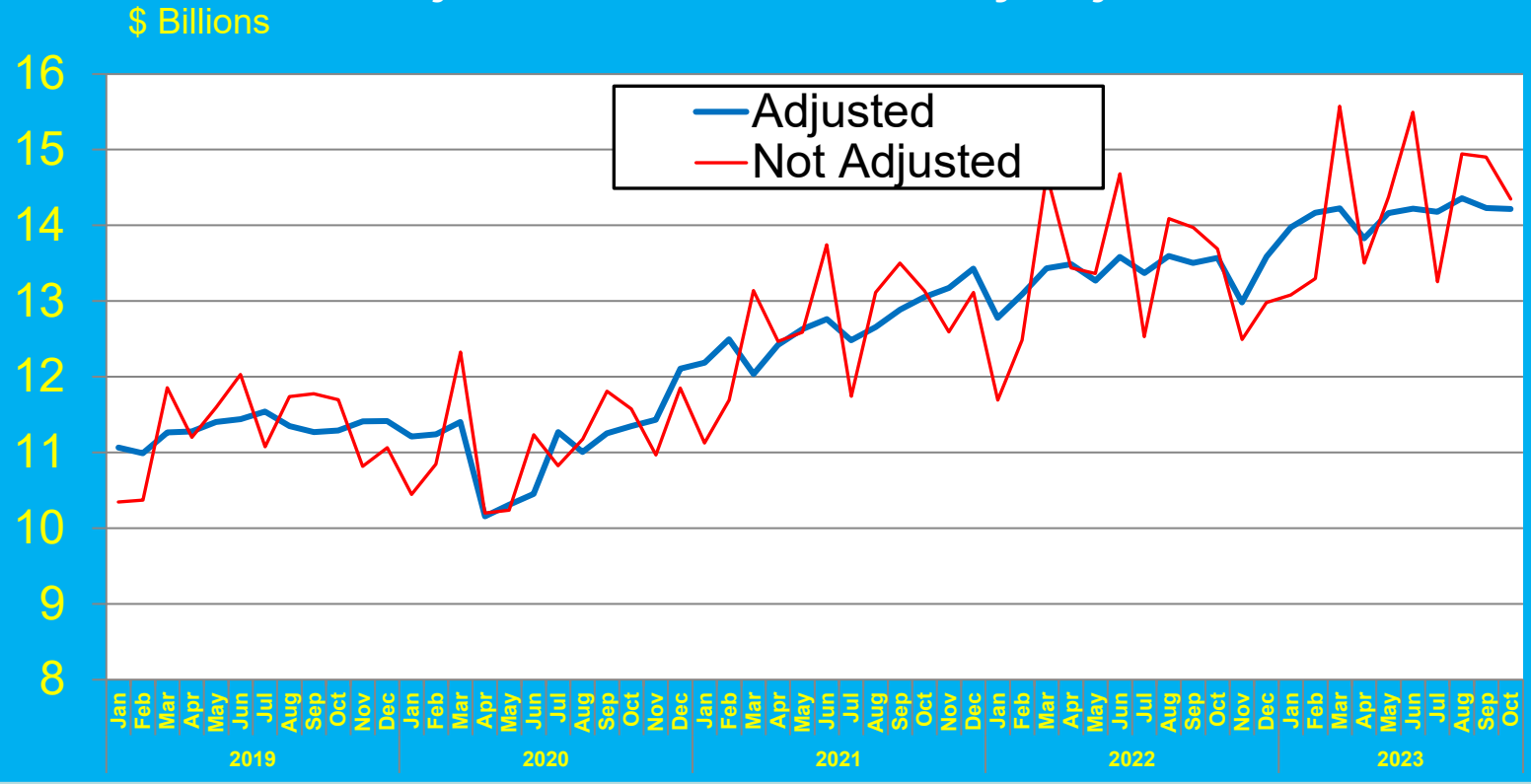
# U.S. Electronic Equipment Book/Bill Ratio




Source: www.census.gov/

# U.S. Electronic Equipment Orders

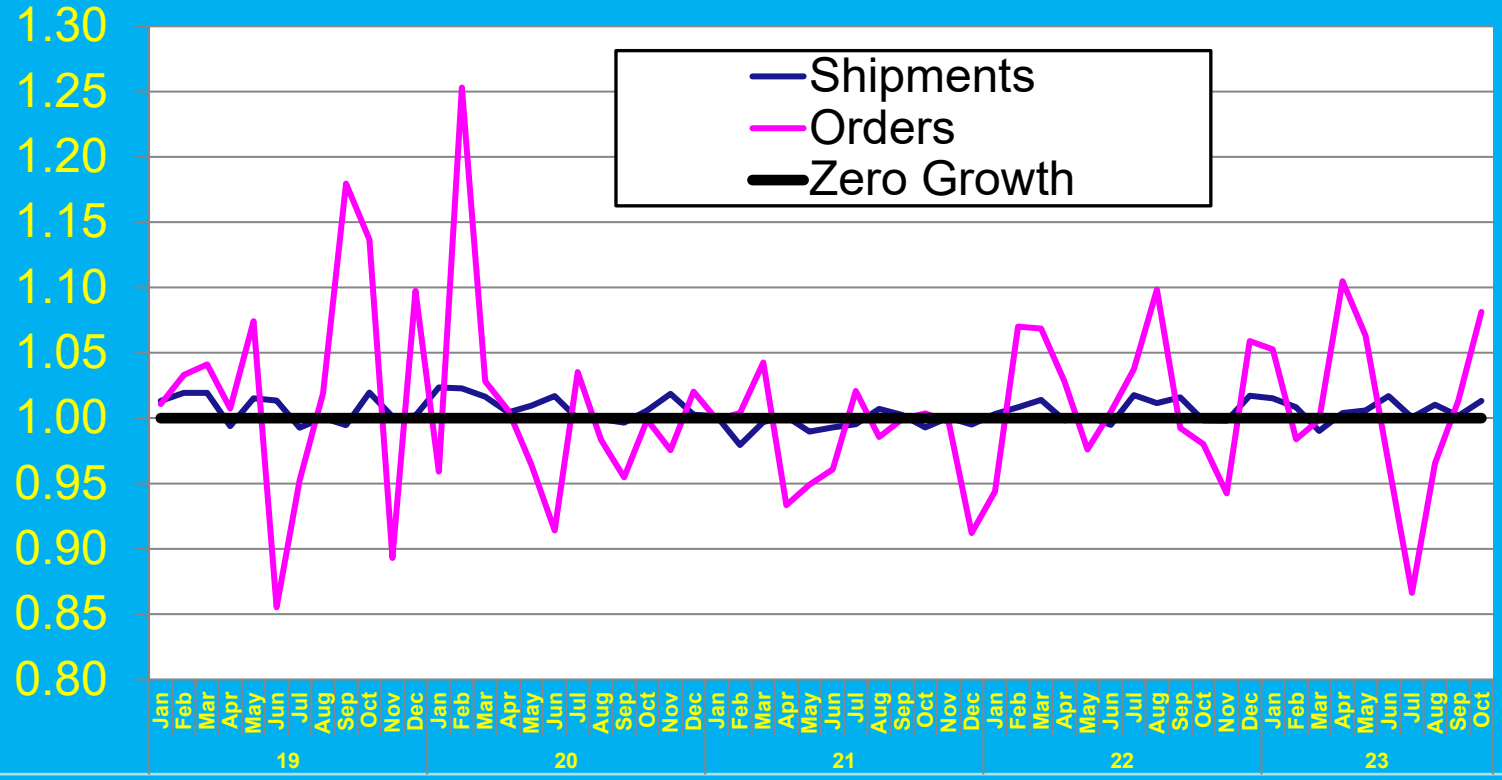
## Adjusted vs. Non Seasonally Adjusted




Source: www.census.gov

# U.S. Electronic Equipment Order & Shipment Growth

## Computer, Communications, Measurement & Control and Military




Source: www.census.gov

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# Summary and Conclusions

- Reshoring or Nearshoring has increased but is selective
- Global companies are relocating to improve logistics and for political reasons
- Shorter and safer supply chains are now becoming standard
- War and Politics will continue to play a big part in our futures
- **But things are looking OK!**

THANK YOU

# Custer Consulting Group Products

**Daily News Services (6 days/week)**

- Global electronics supply chain
- Automotive electronics supply chain
- Solar/Photovoltaic supply chain

**Business Outlook**

- Market charts & data
  - Global market
  - OEMs
  - Components, EMS, ODM, materials & process equip
  - Solar/Photovoltaic
- Weekly Market Comments with latest charts