

Chart 1

# China "Purchasing Managers" Indices

>50 = Growth

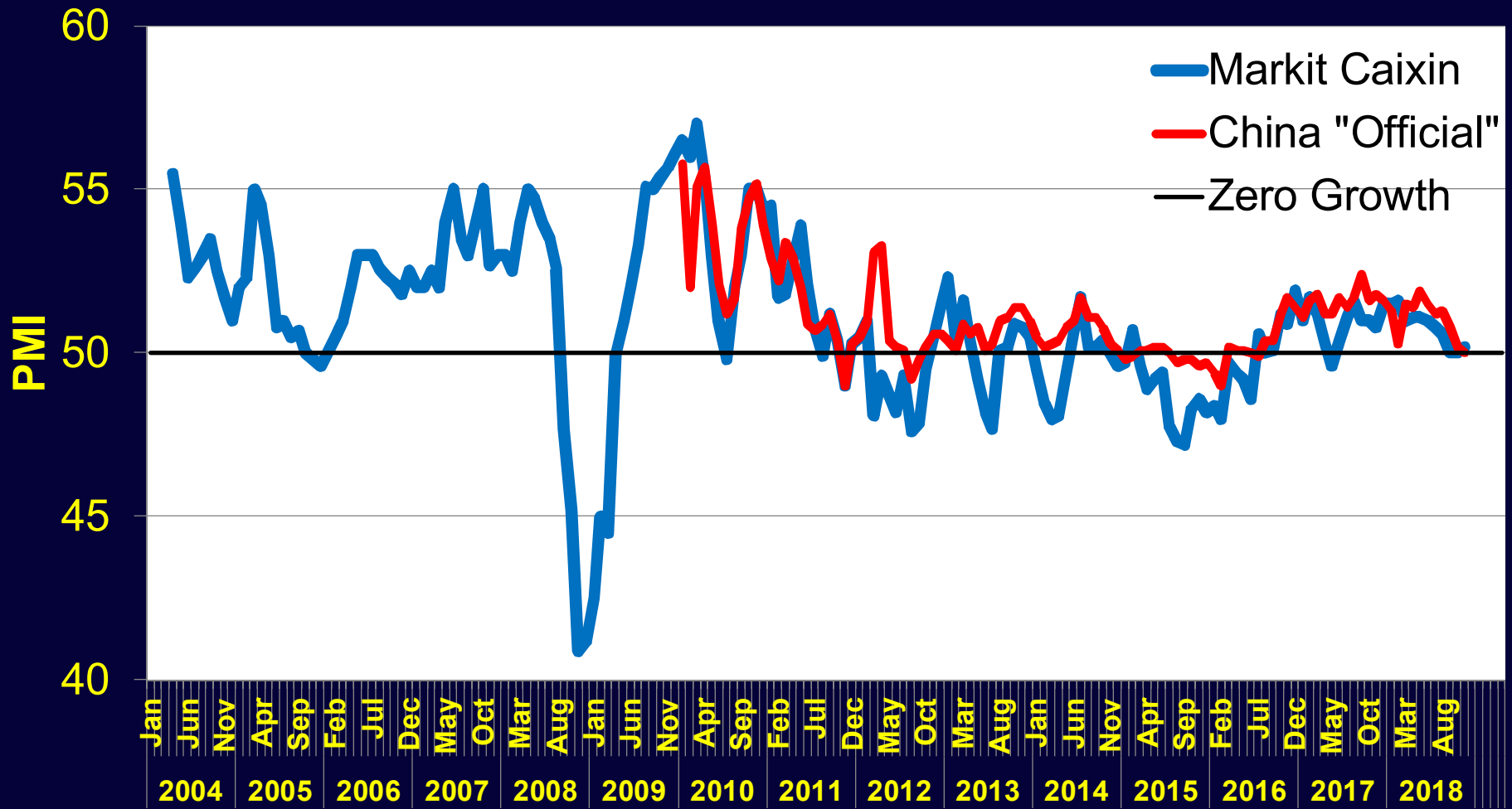


Chart 2

# Taiwan "Purchasing Managers" Index

>50 = Growth

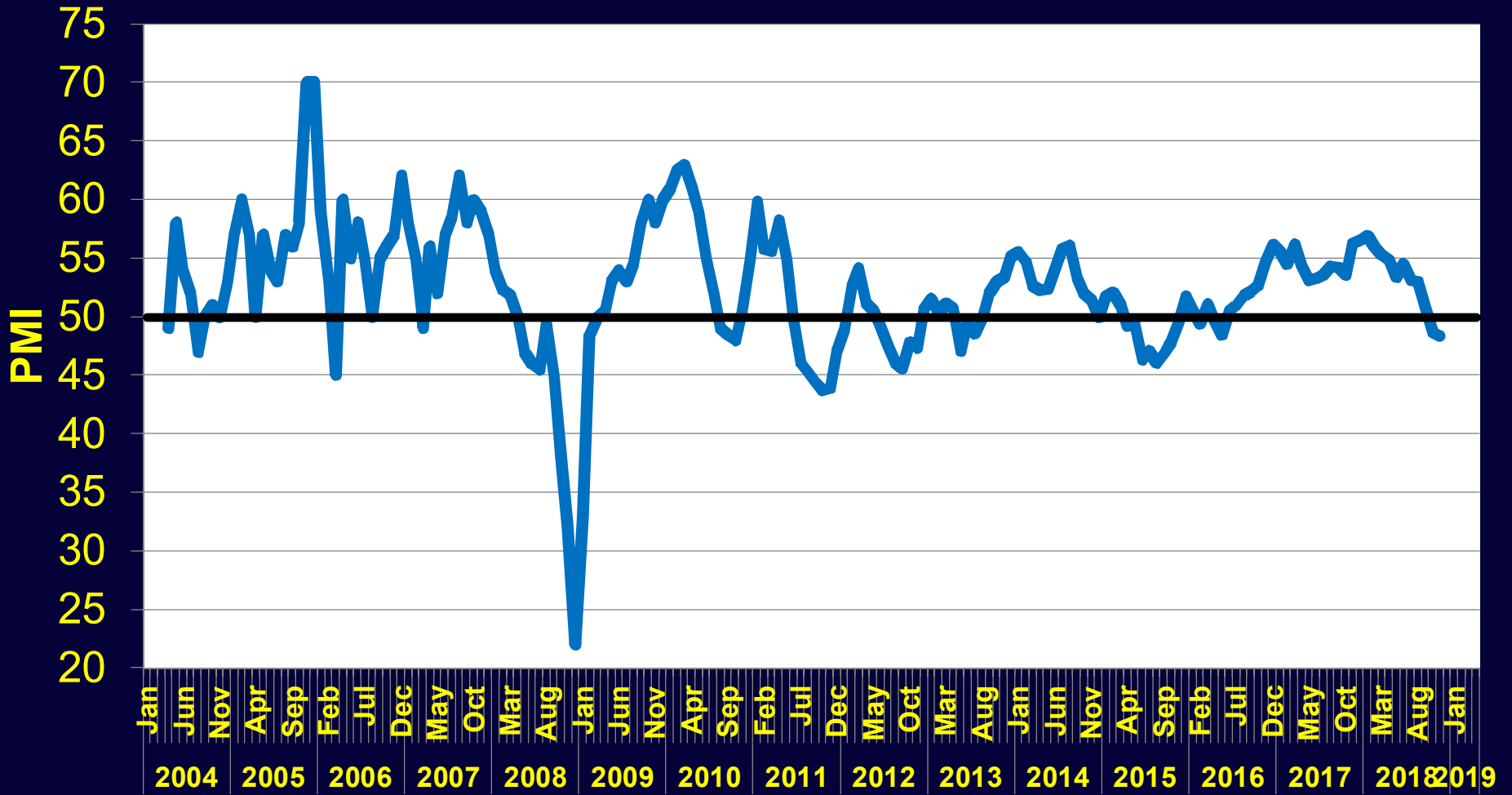
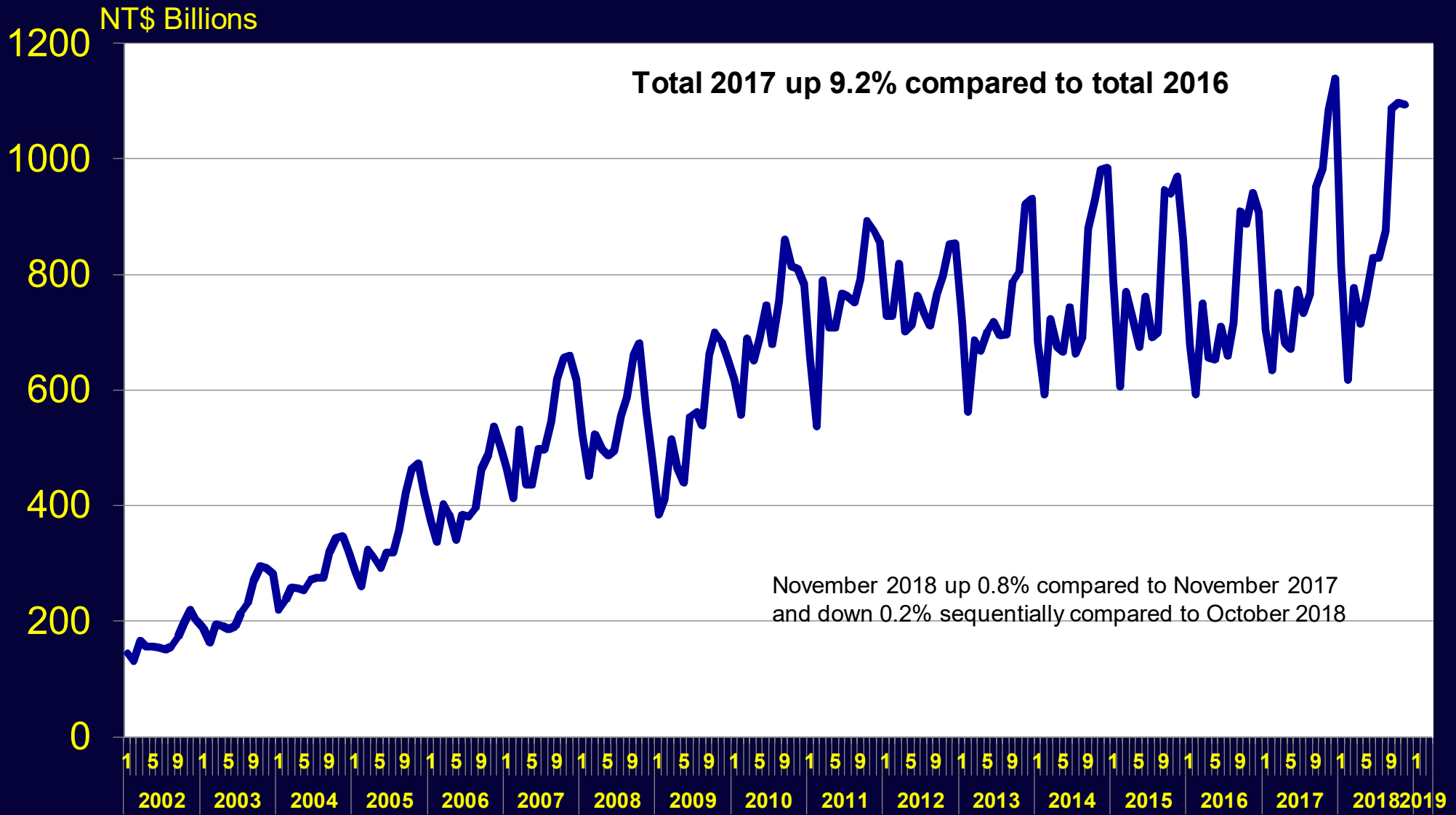


Chart 3

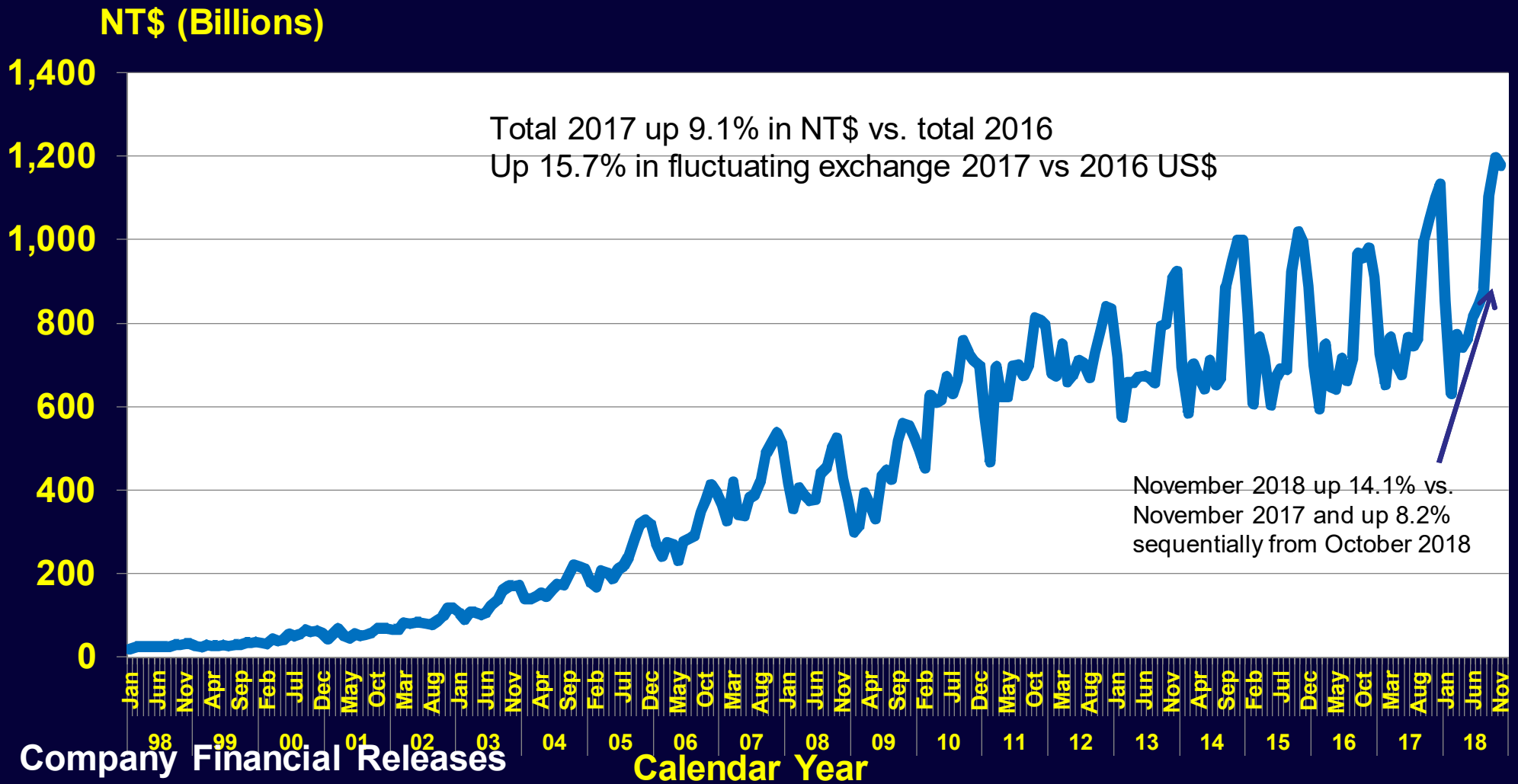
# Taiwan/China Electronic Equipment Producers Composite of 101 Manufacturers Consolidated Revenue



Taiwan listed companies, often with significant manufacturing in China

Chart 4

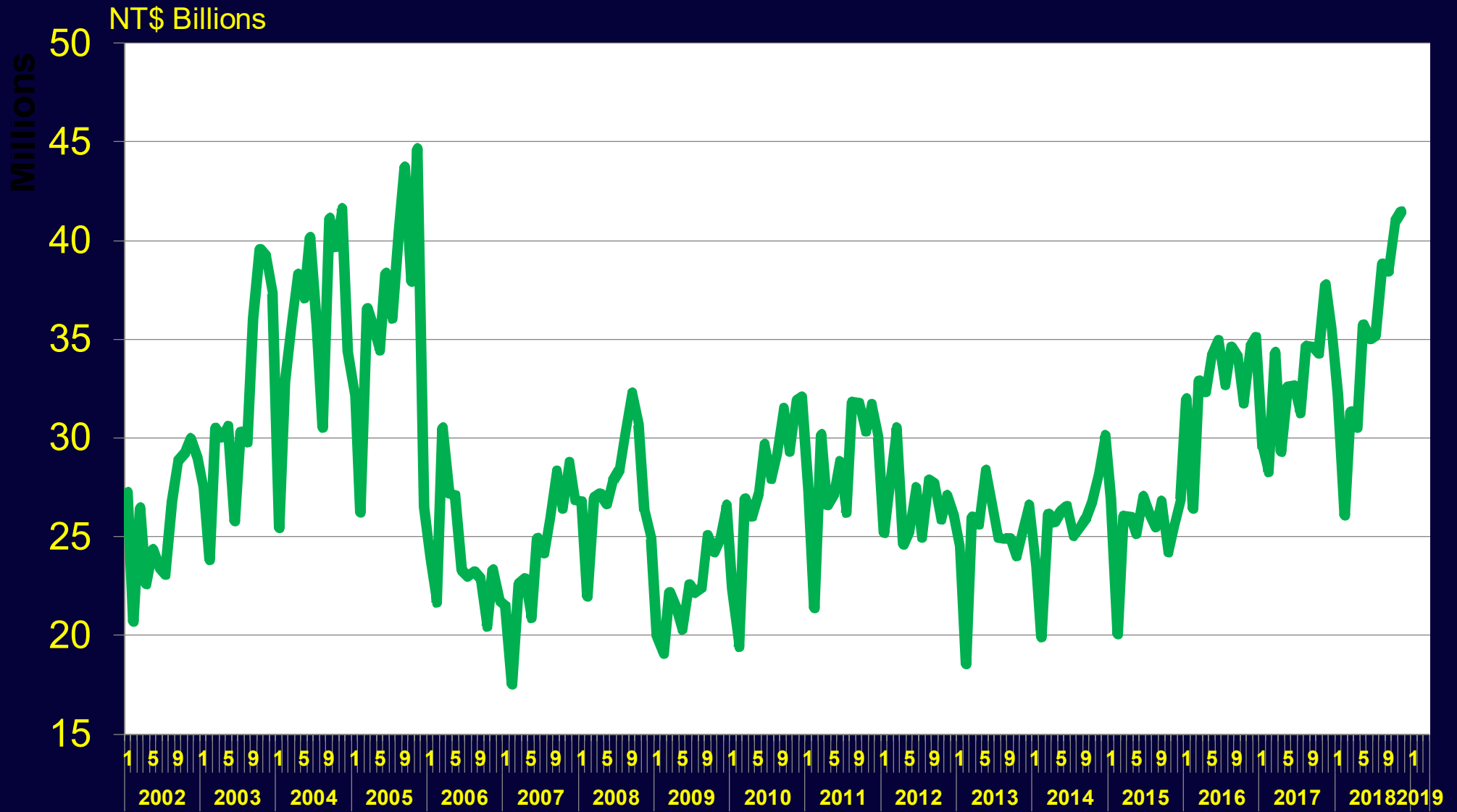
# Taiwan ODM Companies Composite Sales of 11 Large Manufacturers



Asustek Computer, Chei Mei, Compal Electronics, Foxconn, Chimei Innolux, Inventec, Inventec Appliance, Lite On Technology, Mitac International, Pegatron, Quanta Computer, Wistron, Chei Mei Display replacing Chei Mei & Innolux Display 3/10 & later

Chart 5

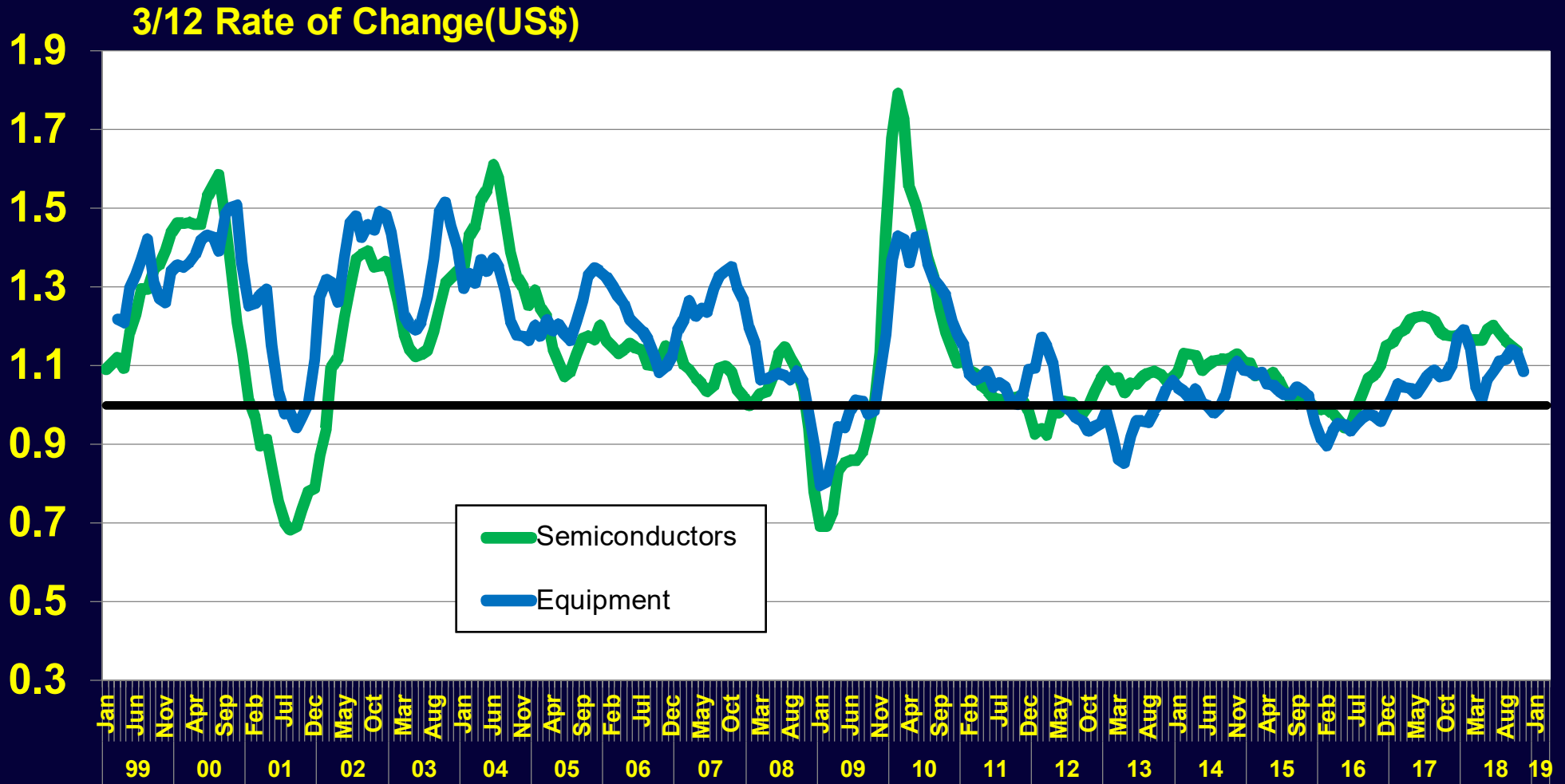
# Taiwan Network Equipment Producers Composite of 34 Manufacturers



Taiwan listed companies, often with significant manufacturing in China

Chart 6

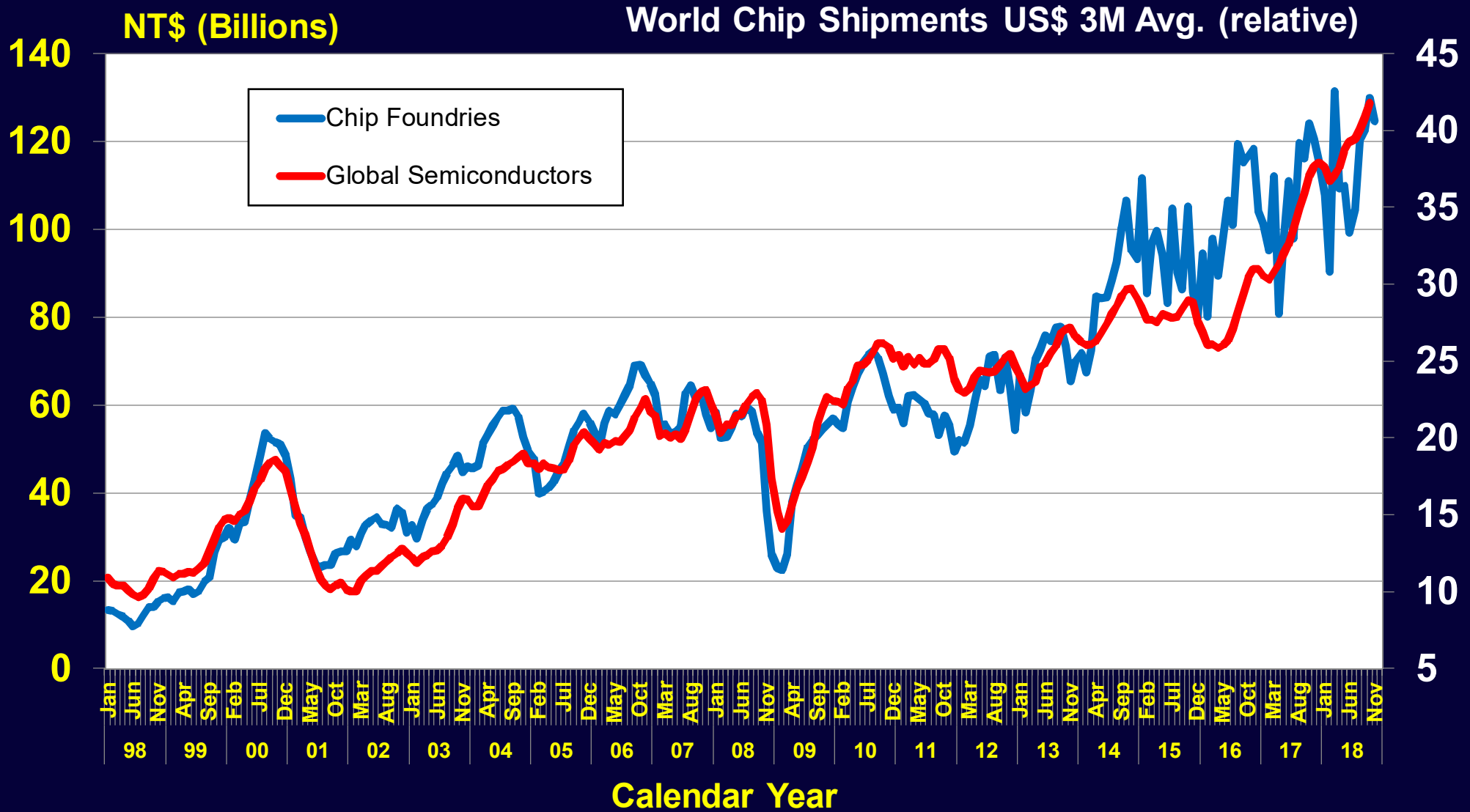
# Semiconductor Shipments to Asia/Pacific vs. Taiwan/China Electronic Equipment Production



Total \$ Semiconductor Shipments from All Countries to SE Asia [www.sia-online.org/](http://www.sia-online.org/)  
101 Taiwan listed companies, often with significant manufacturing in China

Chart 7

# Taiwan Wafer Foundry Composite vs. Global Semiconductor Revenues



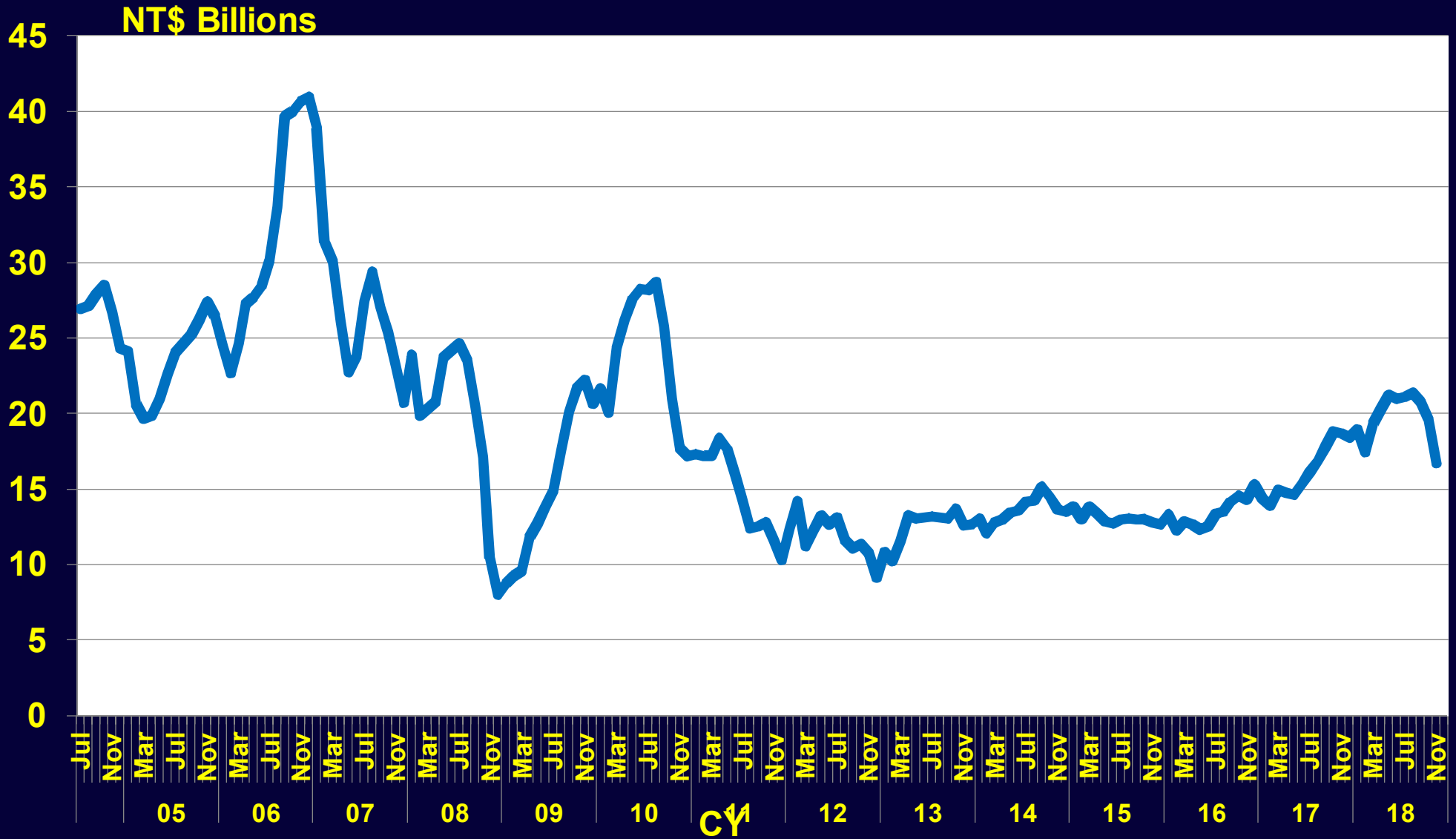
14 Taiwan Company Financial Releases & SIA

# Taiwan Package & Test Companies Composite of 20 Manufacturers



ASE Industrial Holdings (was ASE & SPIL), Ardentec, ChipMOS Tech, Chipbond Tech, E'dale Tech, Formosa, Advance Tech, Fupo Elec, Greatek Elec, International Semiconductor Tech, King Yuan Elec, Lingsen Precision, Orient Semiconductor, Powertech Tech, Signality System, Sigurg Microelectronics, Thalín Semiconductor, Vate Tech, Walton Advanced Tech

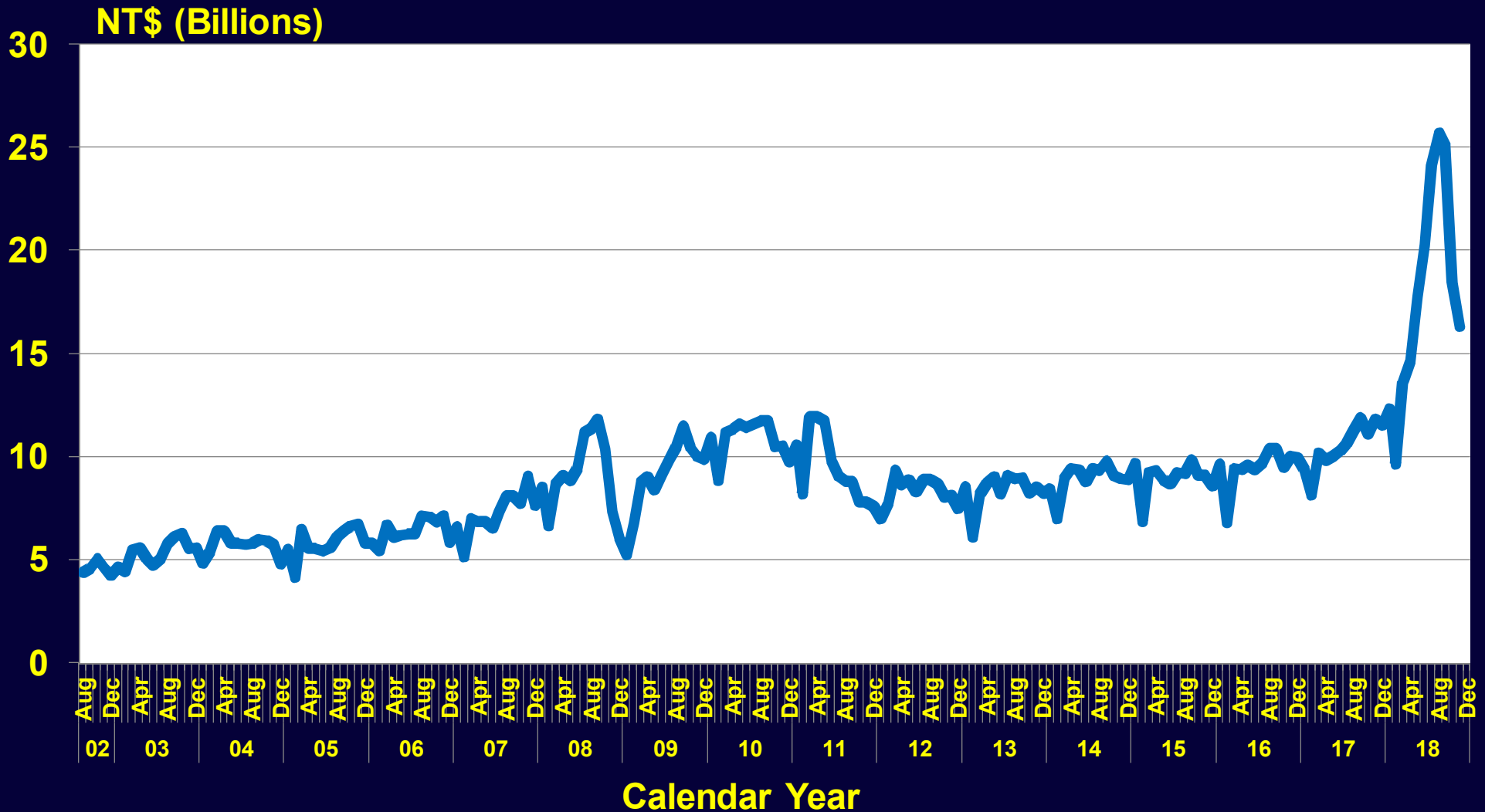
# Taiwan Memory Companies Composite of 7 Manufacturers



Silicon Integrated Systems, Macronix Intl, Mosel Vitelic, NanYa Tech, Powerchip Semiconductor, ProMOS, Winbond Elec

Chart 10

# Taiwan Passive Component Companies Composite Sales of 25 Manufacturers



Chilsin Electronics, Cyttec, (FCE) Feei Cheng Enterprise, Holy Stone Enterprise, 3H (Honey Hope Honesty Enterprise), HJC (Hua Jung Components), Inpaq, Jaan Chem Technological, Kaimei Electronic, King Core Electronics, Laser Tek, Leatec Fine Ceramics, Lelon Electronics, Linton Technology, PTTC (Polytronics Technology Corp), PDC (Prosperity Dielectrics Co), Ralec Electronic, Ta-I Technology, Taiwan Alpha Electronic, Team Young Advanced Ceramics, Teapo Electronic, Thinking Electronic Industrial, WTC (Walsin Technology Corp), Yageo, YCTC (Yeh-Chiang Technology Corp)

Chart 11

# Taiwan Solar/Photovoltaic Panel Companies Composite of 27 Manufacturers

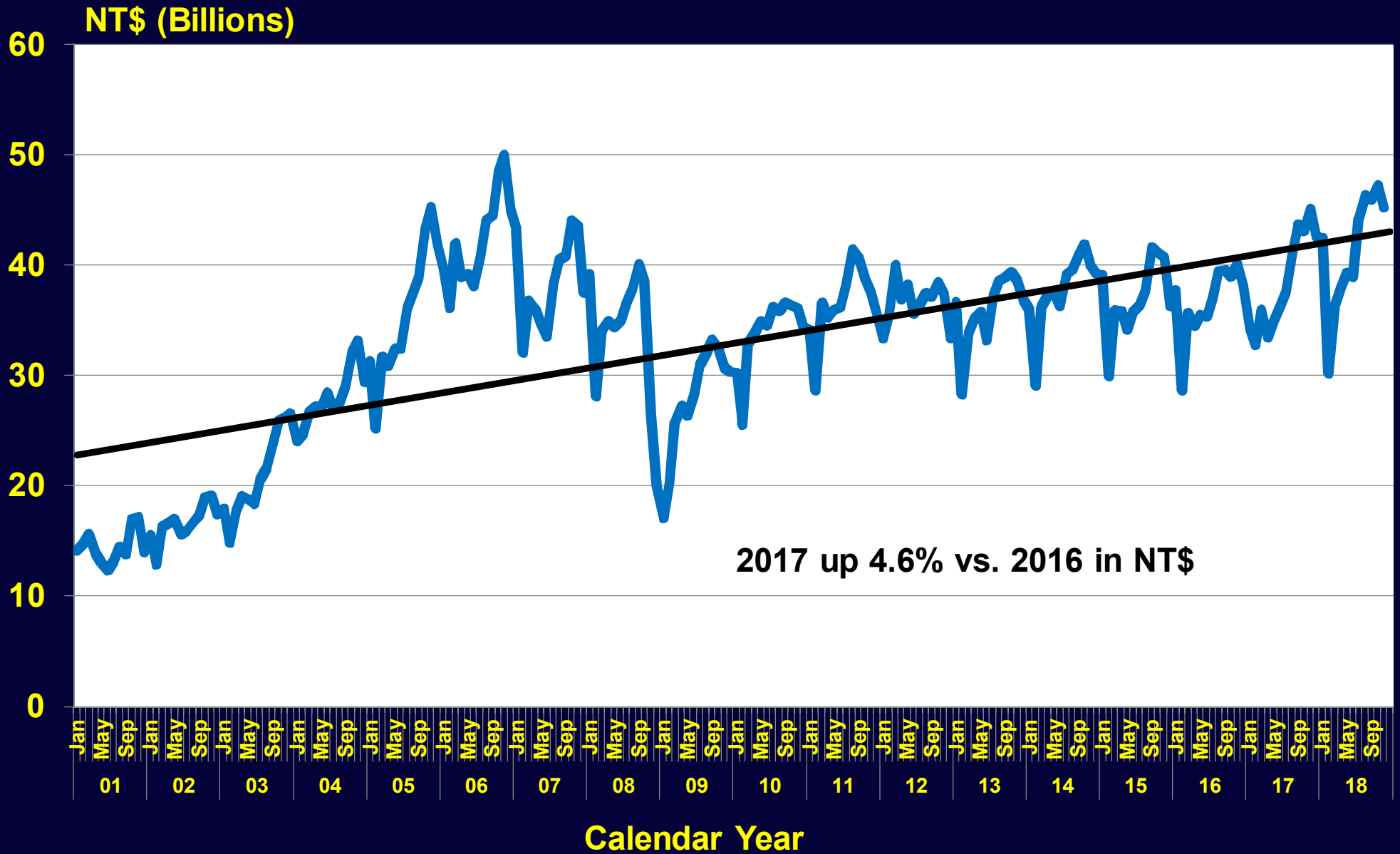


Acter, Big Sun Energy Technology, Chen Full Intl, Danen Technology, Daxon Technology, DeISolar, Delta Electronics, e\_TON Solar Tec, Invetec Group, Eversol, Gigasolar materials, Gintech, Green Energy Technology (GET), Higher Way Elec, Kenmec Mechanical, Ligitek, Motech, Neo Solar Power, Phoenixtec Power Co (PPC), Powermate, Precision Silicon, Sino-American Silicon Products (SAS), Solar Applied Materials Technology, Solartech Energy Corp, Sunrise Global Solar Energy, Sysgration, Tainenergy Tech, Tera Autotec, Tyntek, Wafer Works, Wholetech System Hitech

Chart 12

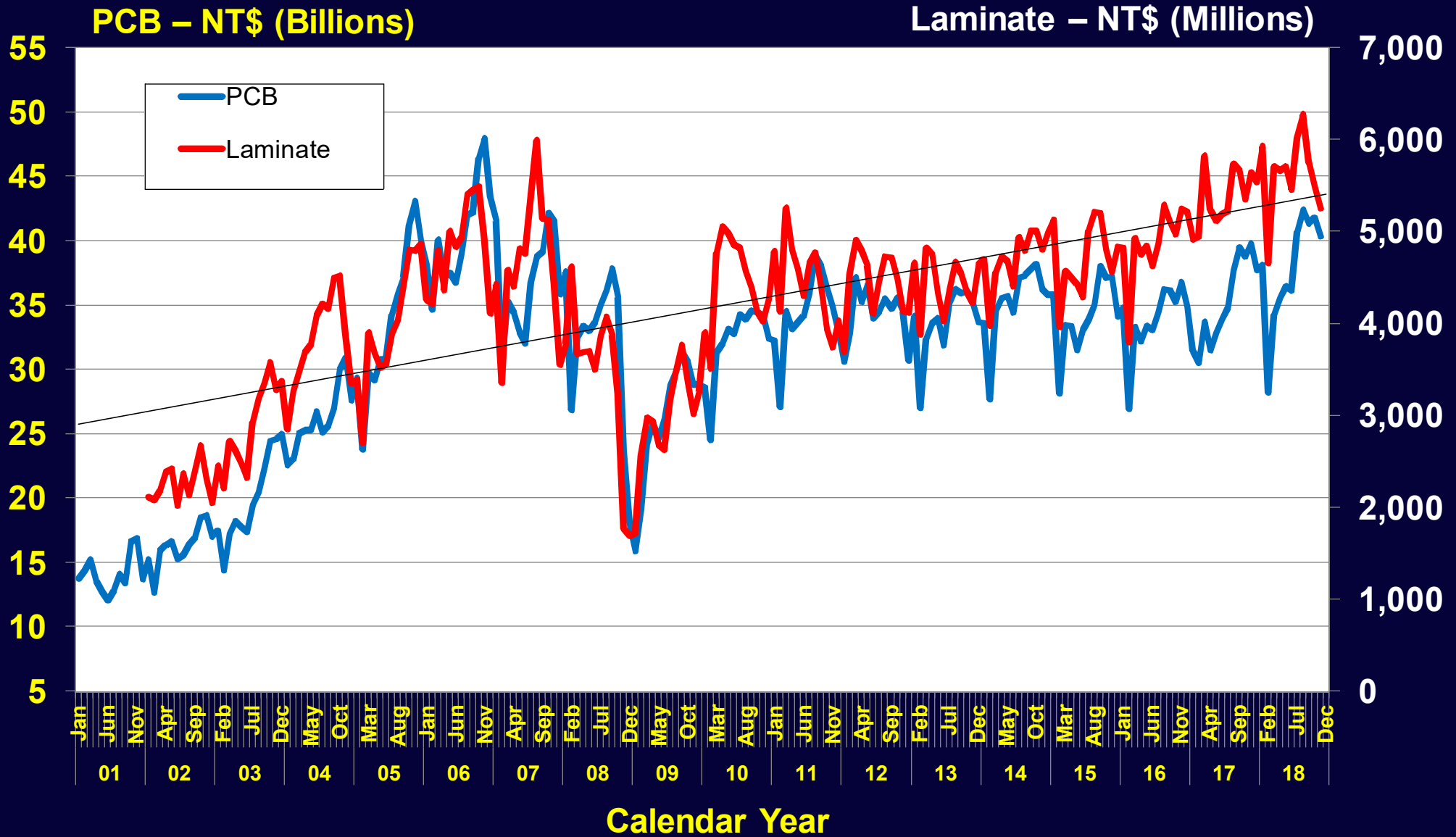
# Taiwan Rigid & Flex PCB Shipments

## Broad Composite of 46 Taiwan-listed Manufacturers



# Taiwan Listed Vendor Shipments

## 42 Rigid PCB & 8 Laminate Manufacturers



Company Financial Releases

# Industrial Production – Europe Manufacturing

Index (2015 Avg. Month = 100, Seasonally Adjusted)

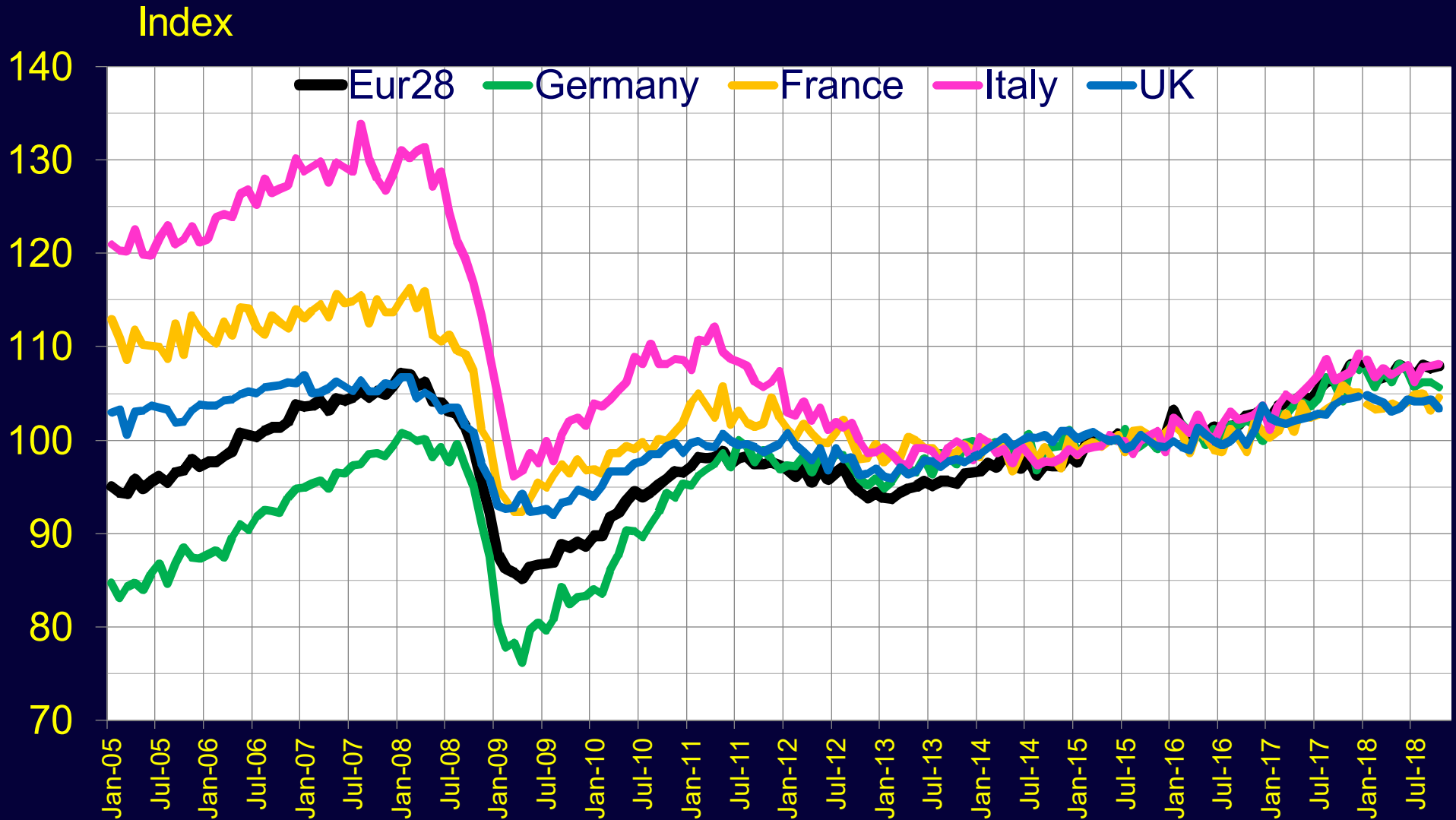
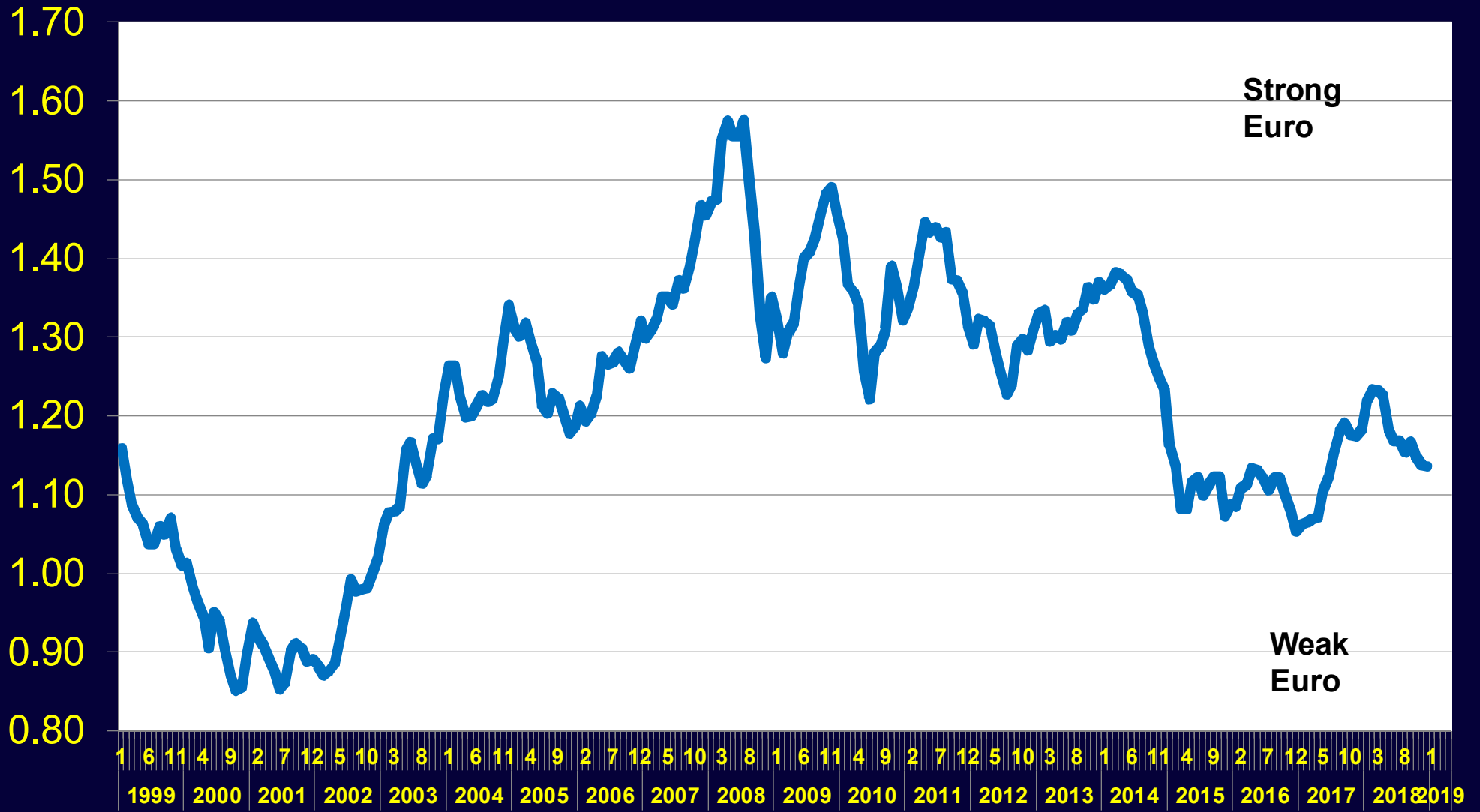


Chart 15

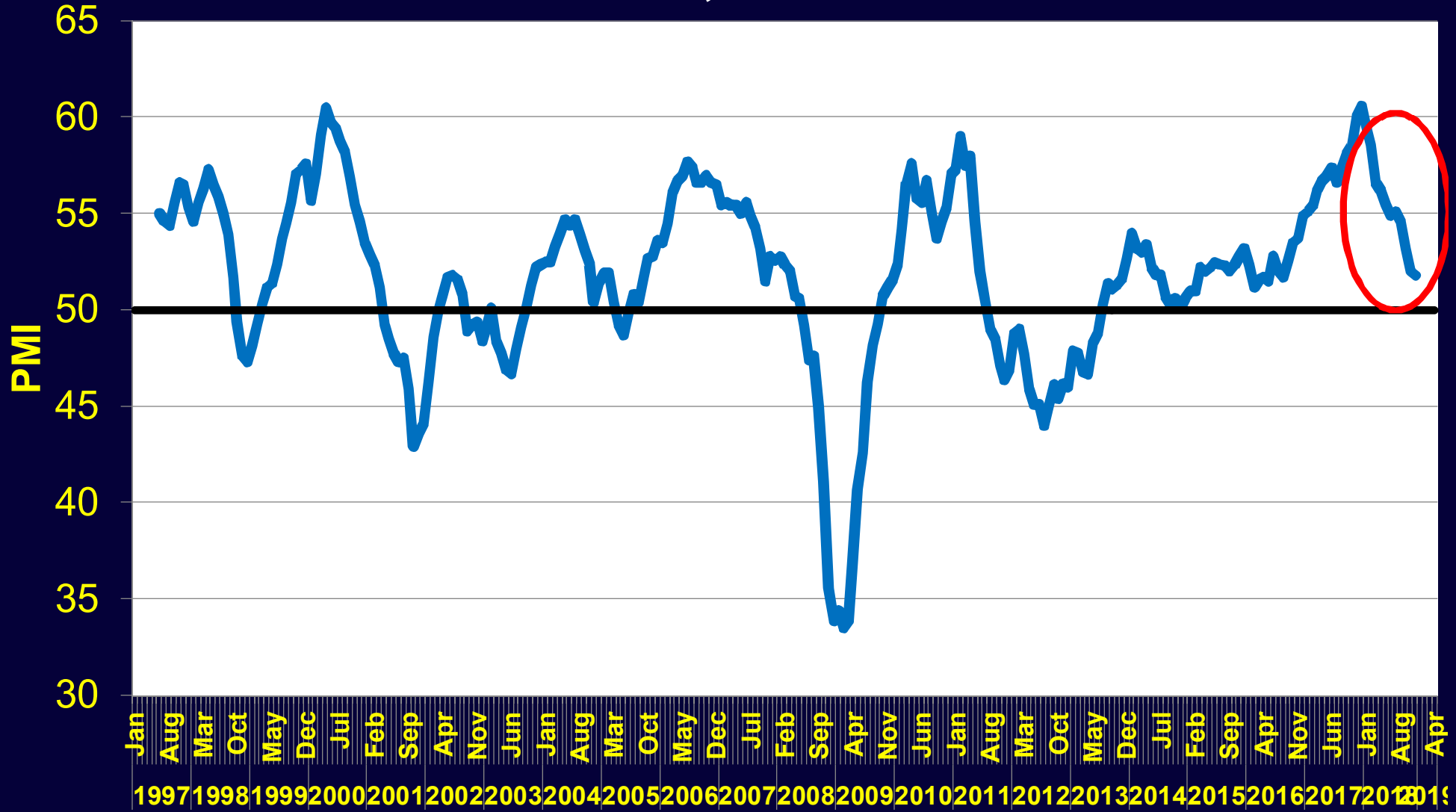
# Euro vs. U.S. Dollar

US\$/Euro

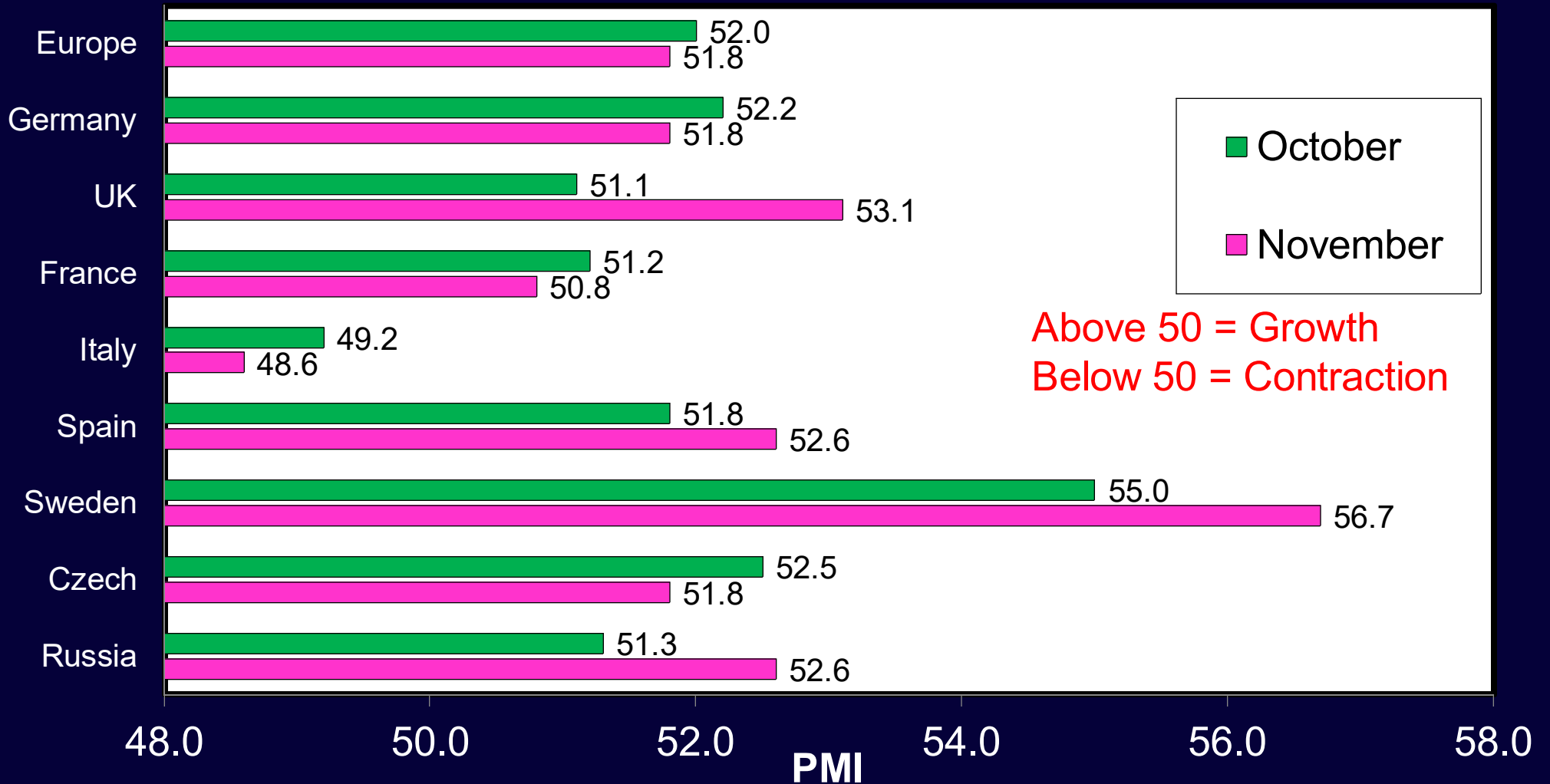


# Eurozone Manufacturing "Purchasing Managers" Index

Diffusion Index, >50 = Growth

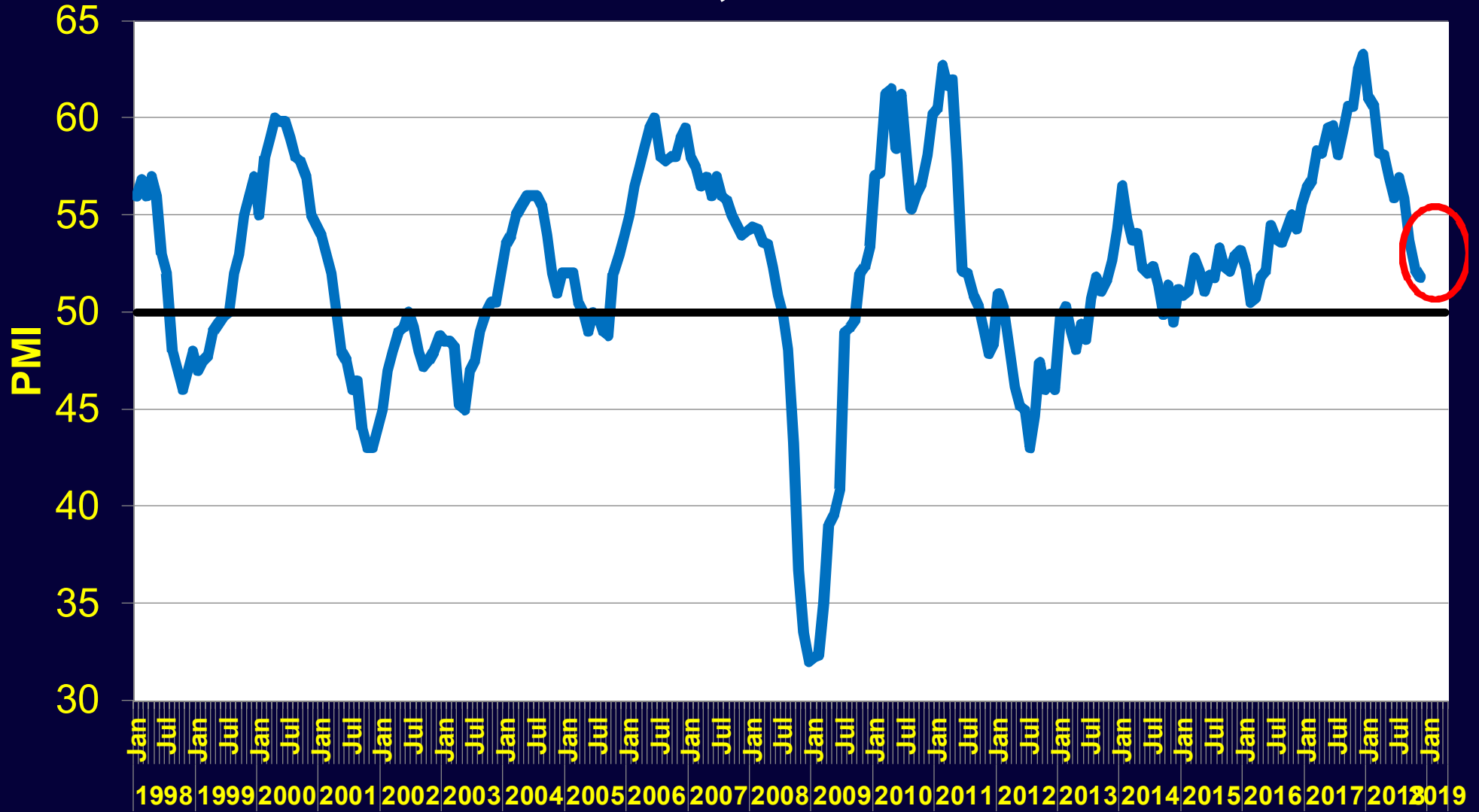


# European Purchasing Managers' Indices November vs October 2018



# Germany Manufacturing "Purchasing Managers" Index

Diffusion Index, >50 = Growth



# France Manufacturing "Purchasing Managers" Index

Diffusion Index, >50 = Growth

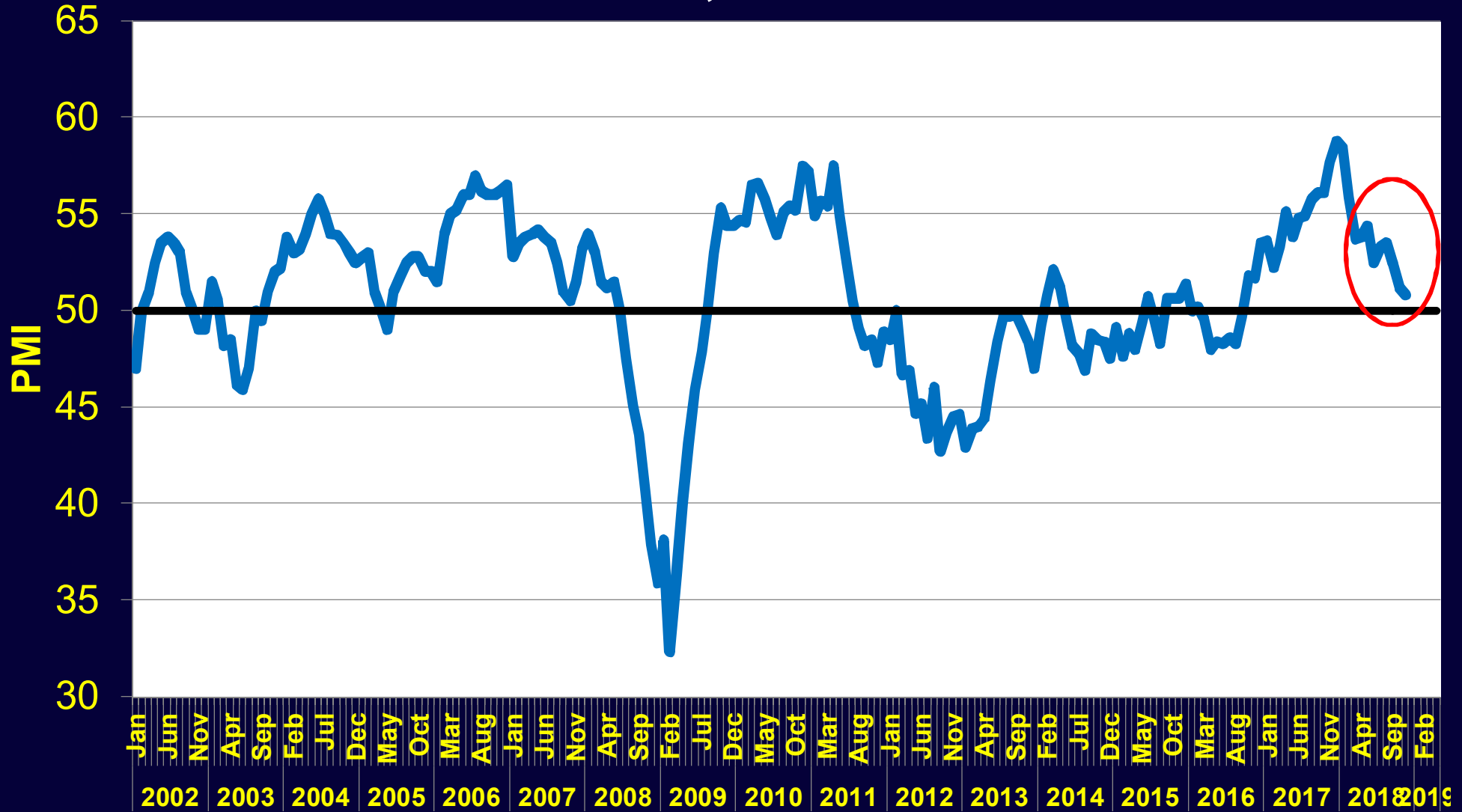
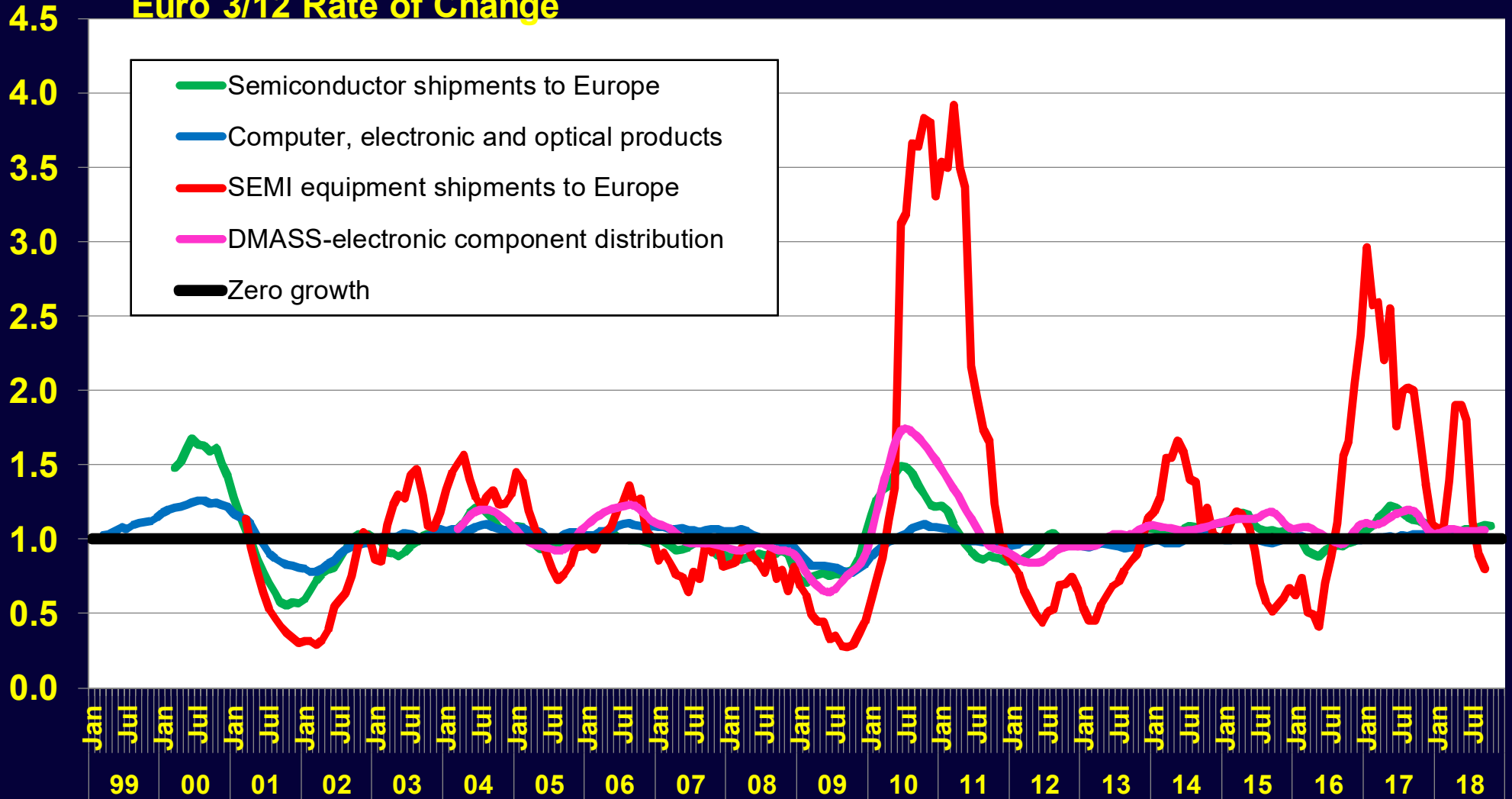


Chart 20

# European Computer, Electronic and Optical Products, Semiconductors, & SEMI Equipment Shipments

Euro 3/12 Rate of Change



Total \$ Semiconductor Shipments from All Countries to Europe [www.sia-online.org/](http://www.sia-online.org/),  
Eurostat class C26 & SEMI, CCG Extrapolation of SEMI growth

# European Computer, Electronic & Optical Products Production

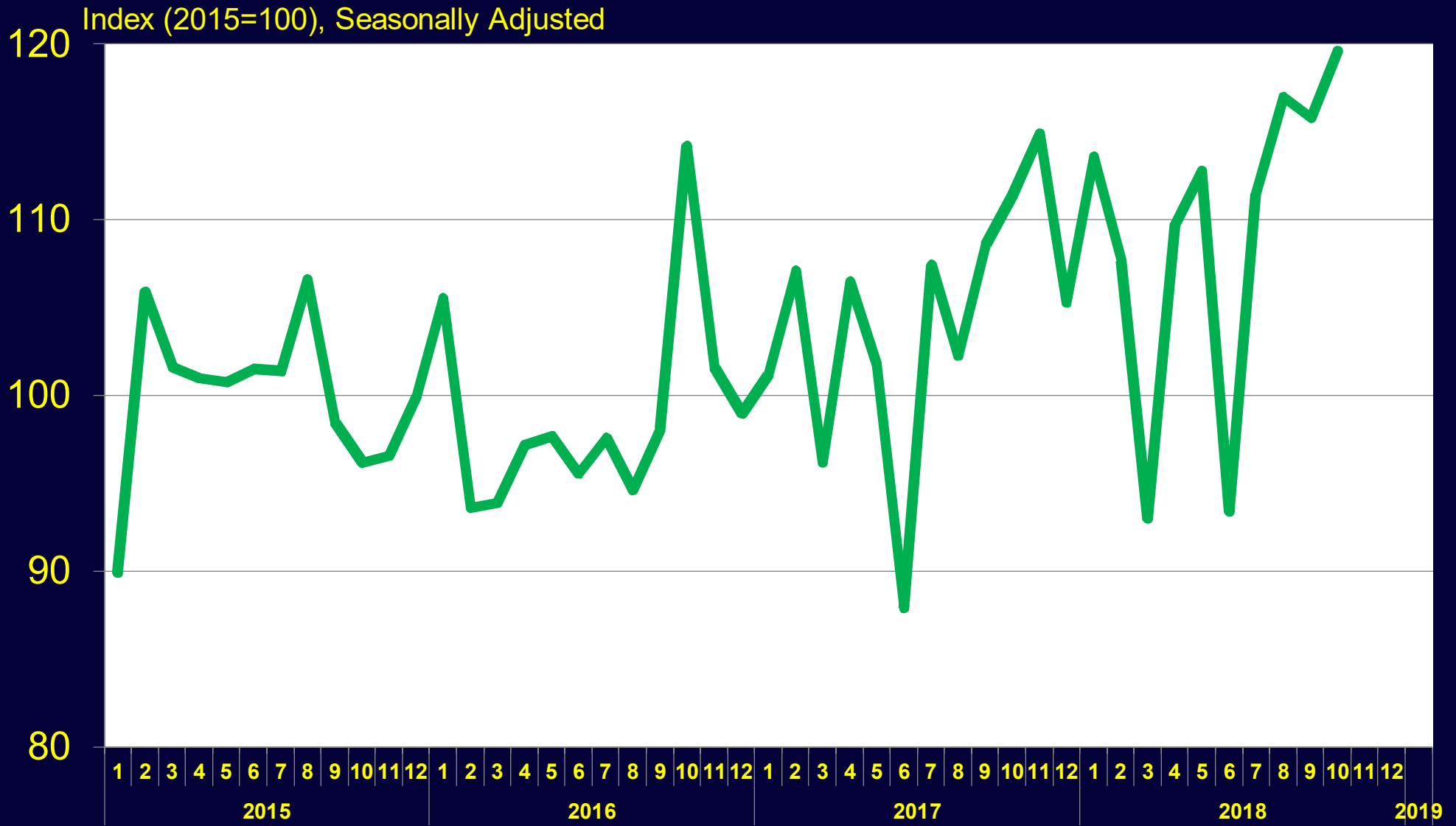


Chart 22

# European Production - Instruments & Appliances for Measuring, Testing & Navigation

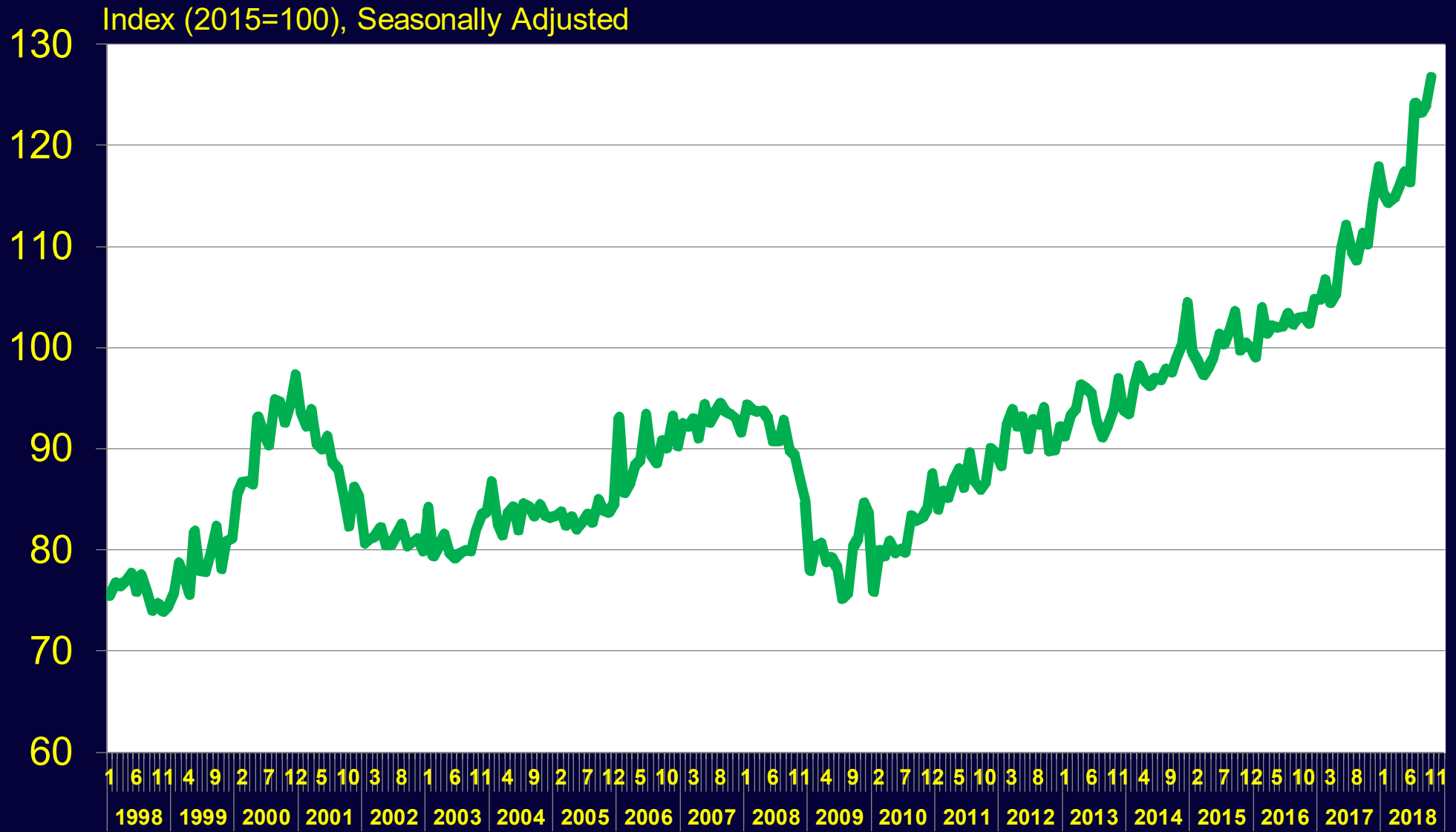


Chart 23

# European Production - Irradiation, Electromedical & Electrotherapeutic Equipment

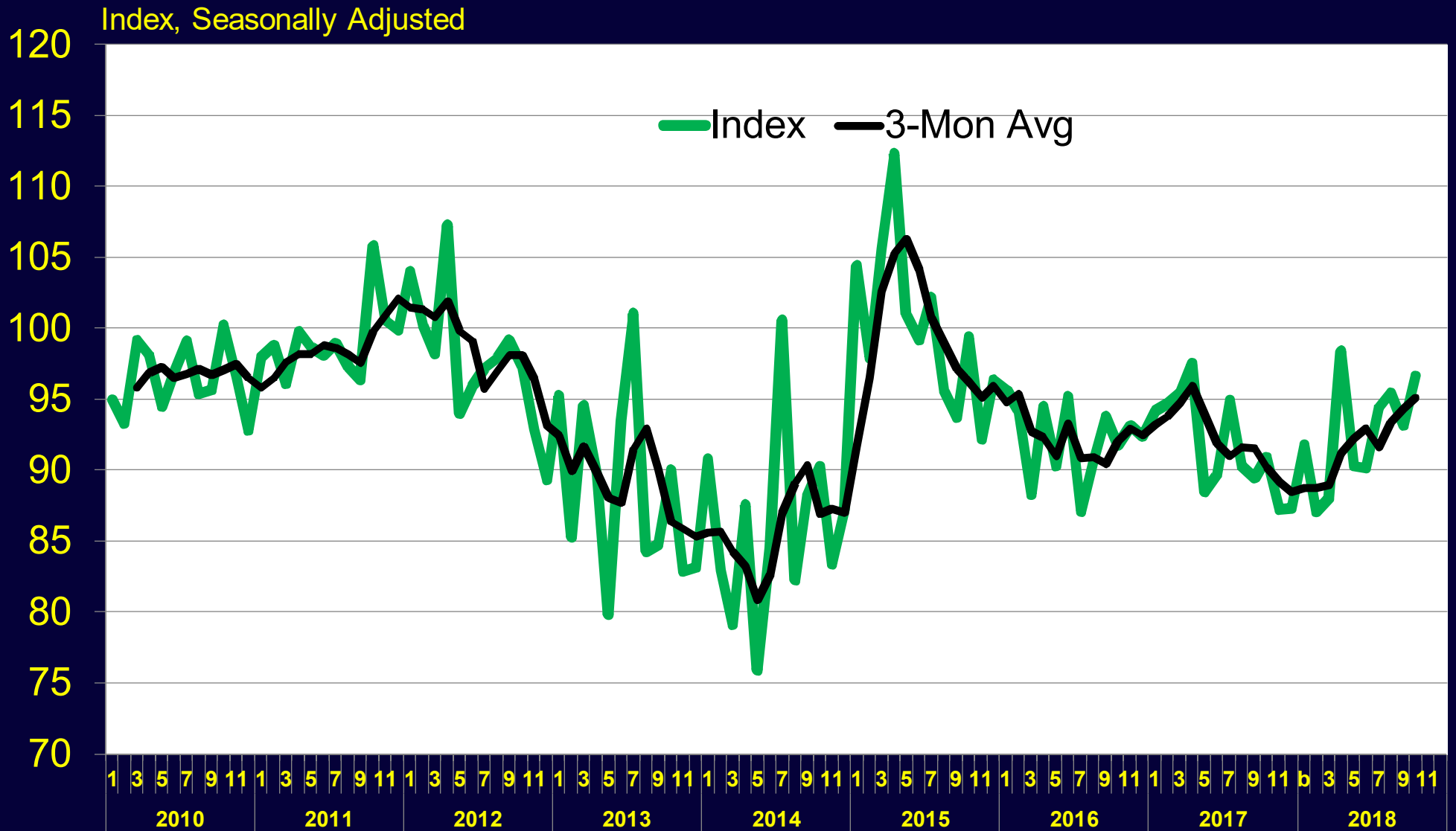
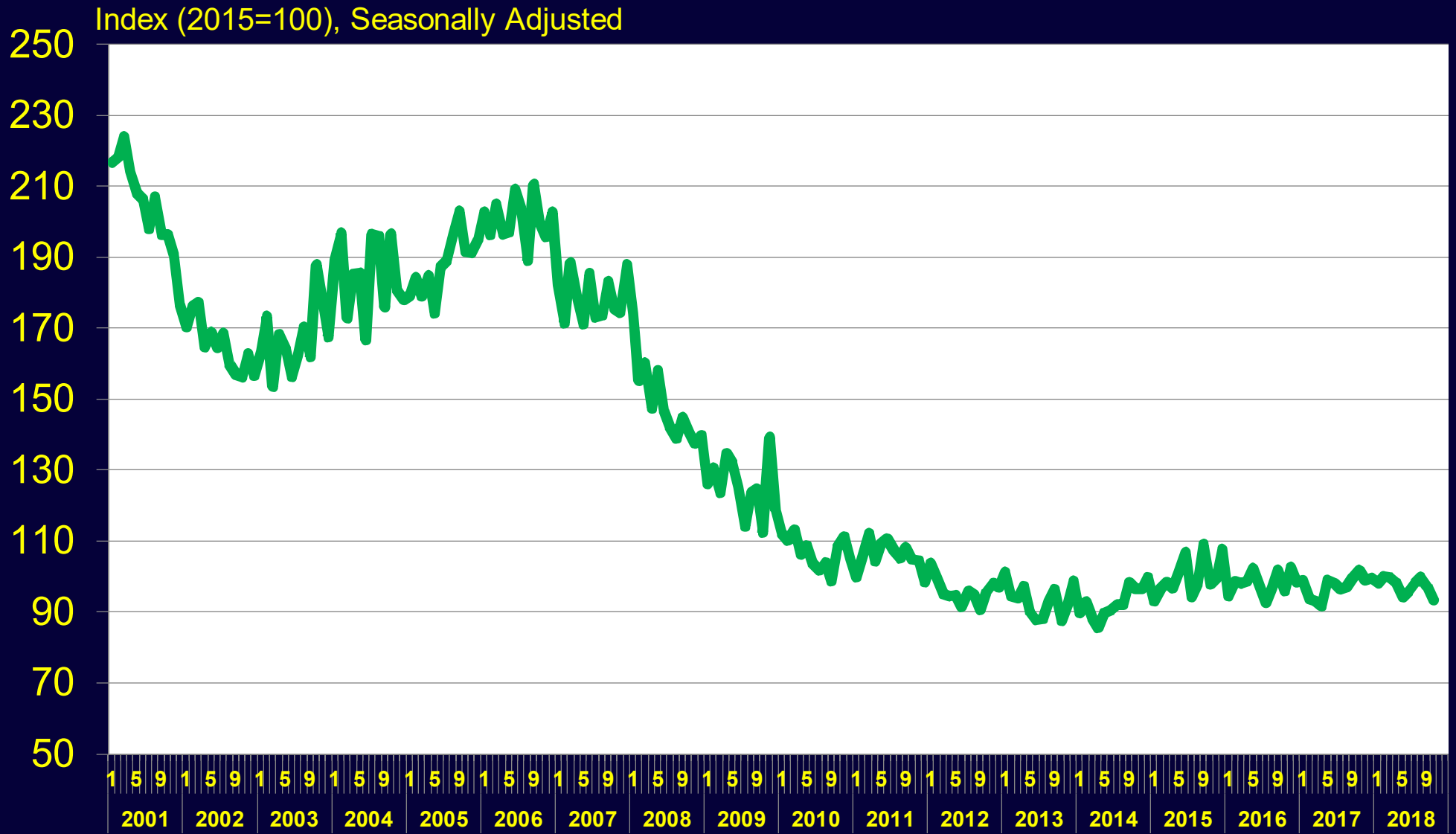


Chart 24

# European Production – Communication Equipment



# European Motor Vehicle Production

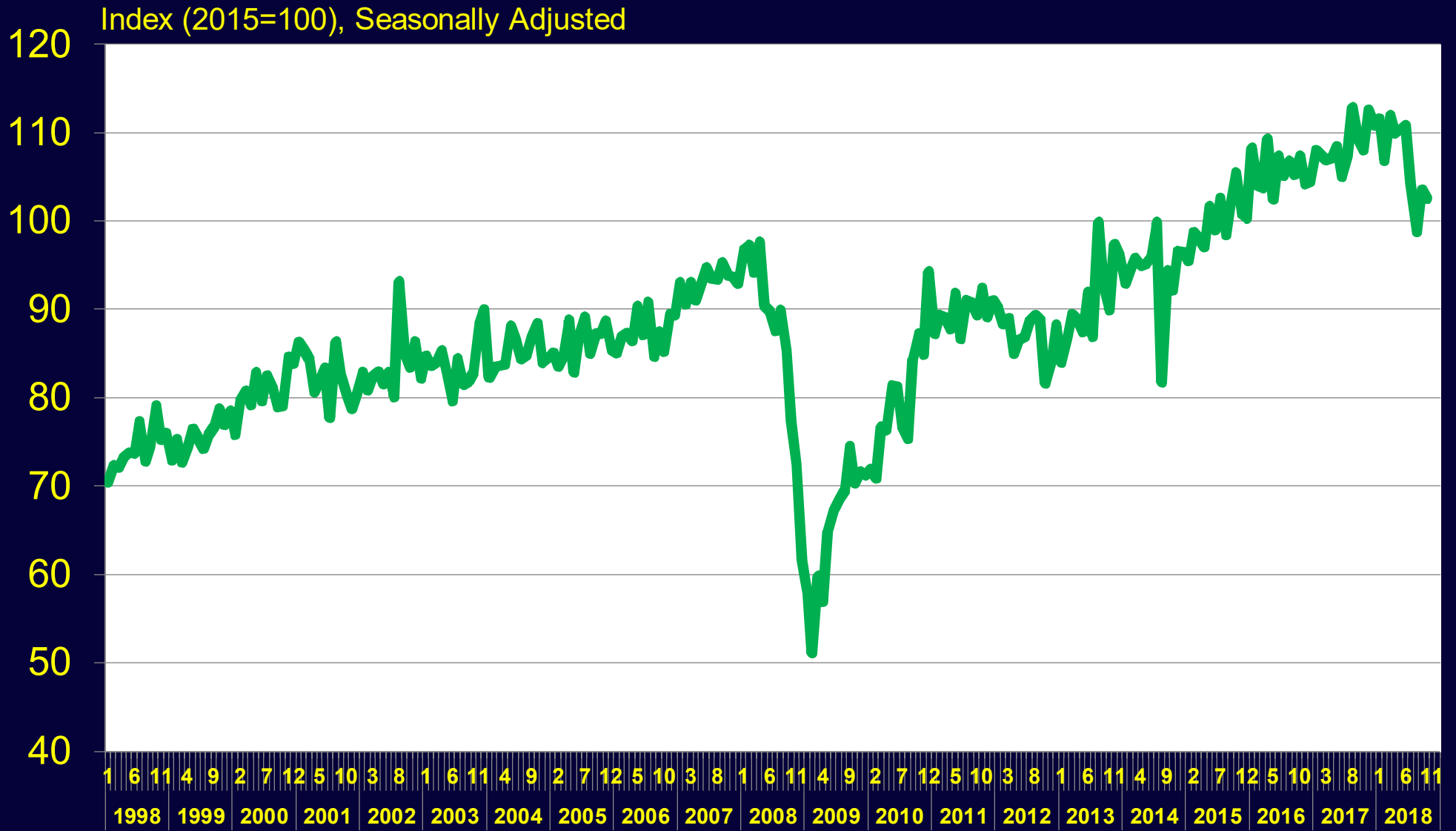
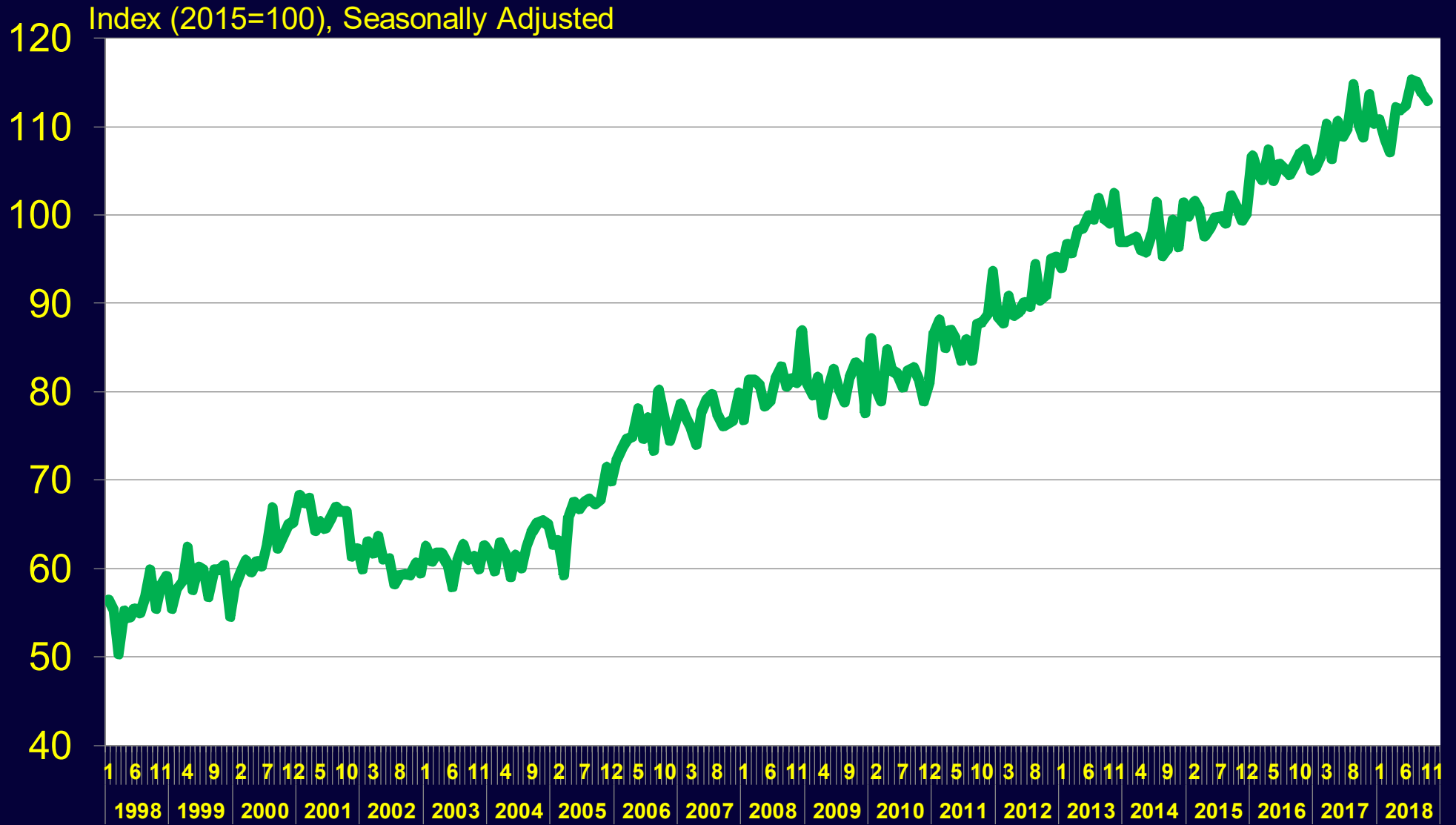
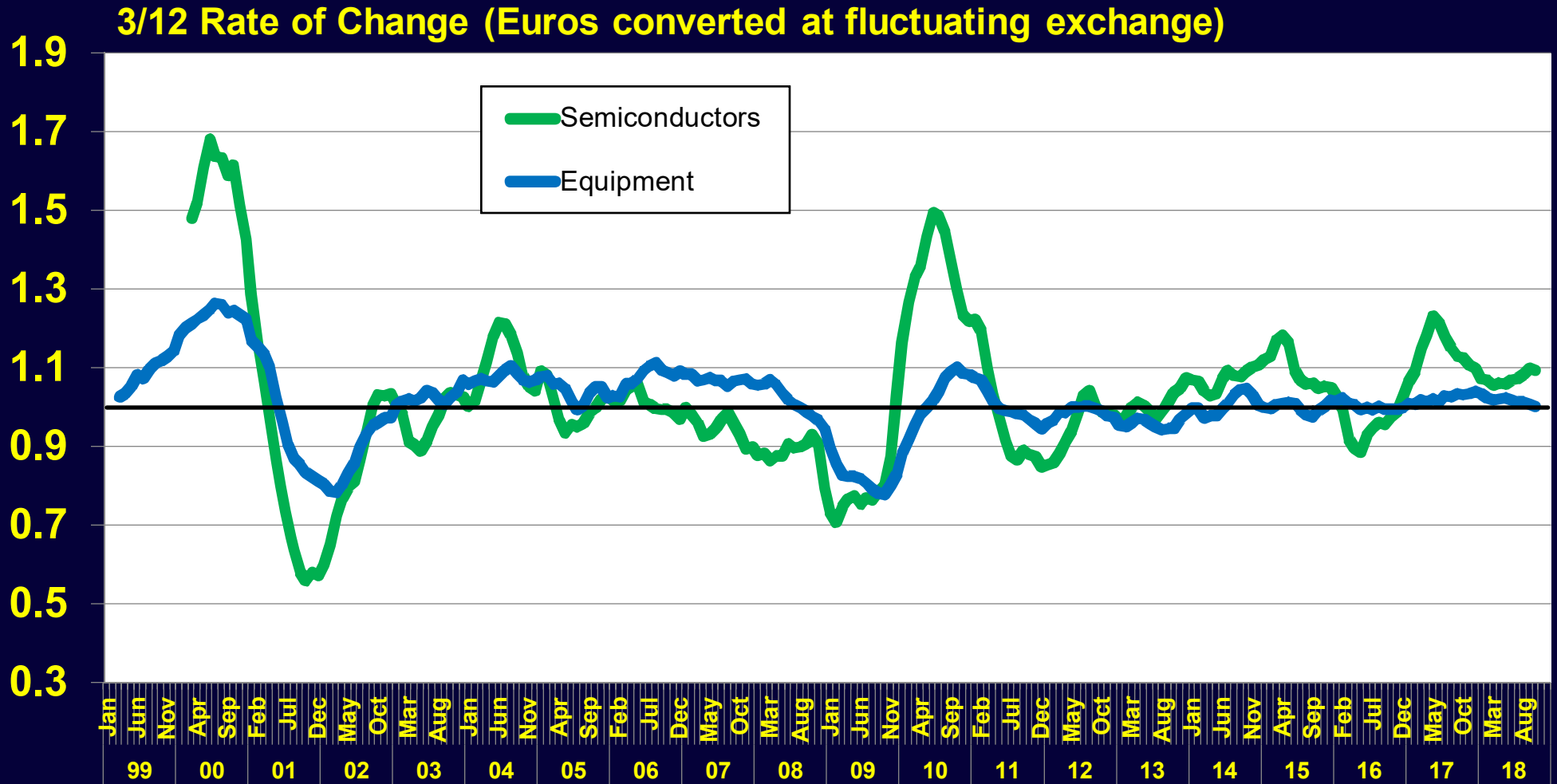


Chart 26

# European Production - Aircraft, Spacecraft & Related Equipment

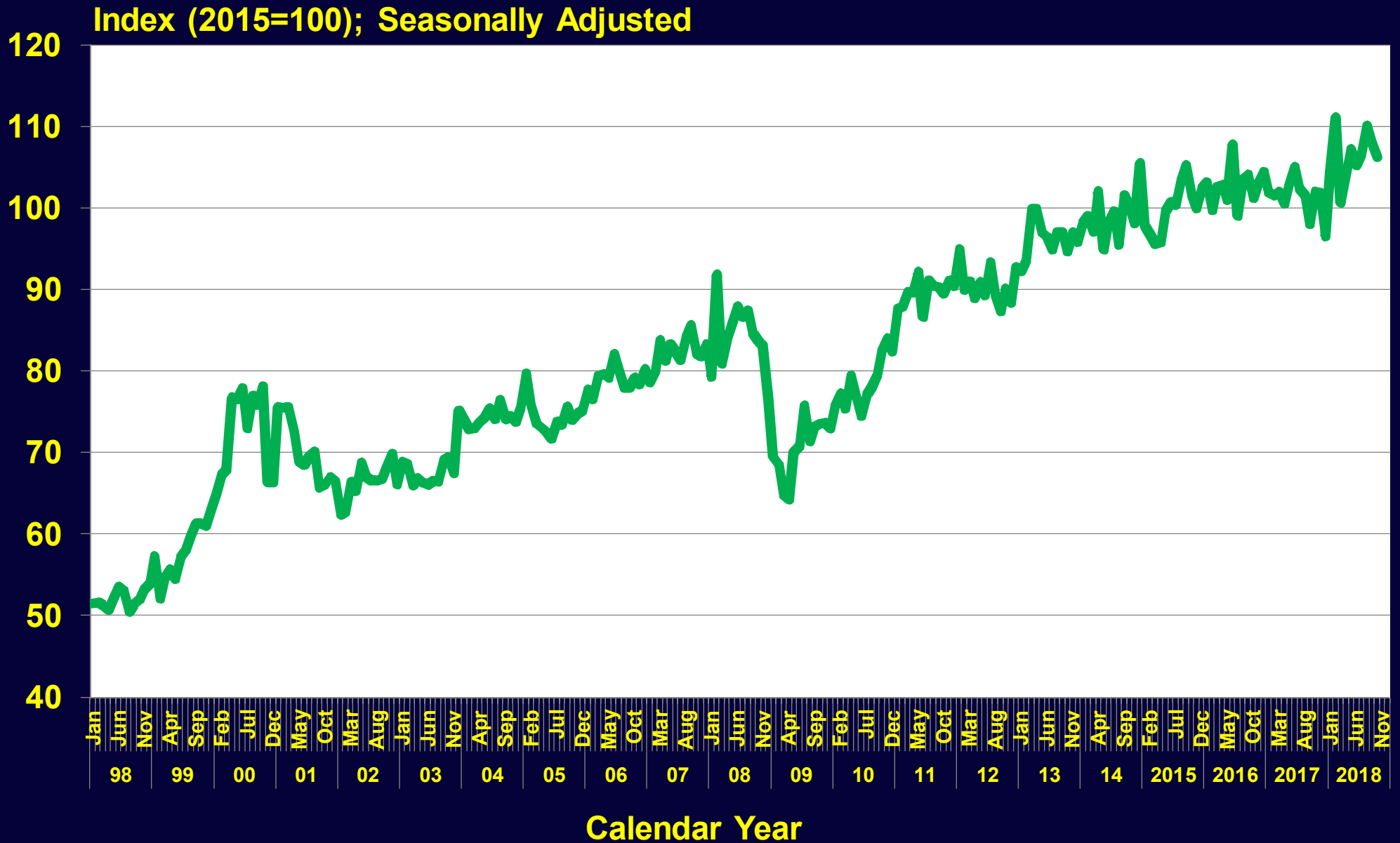


# Semiconductor Shipments to Europe vs. European Electronic Equipment Production

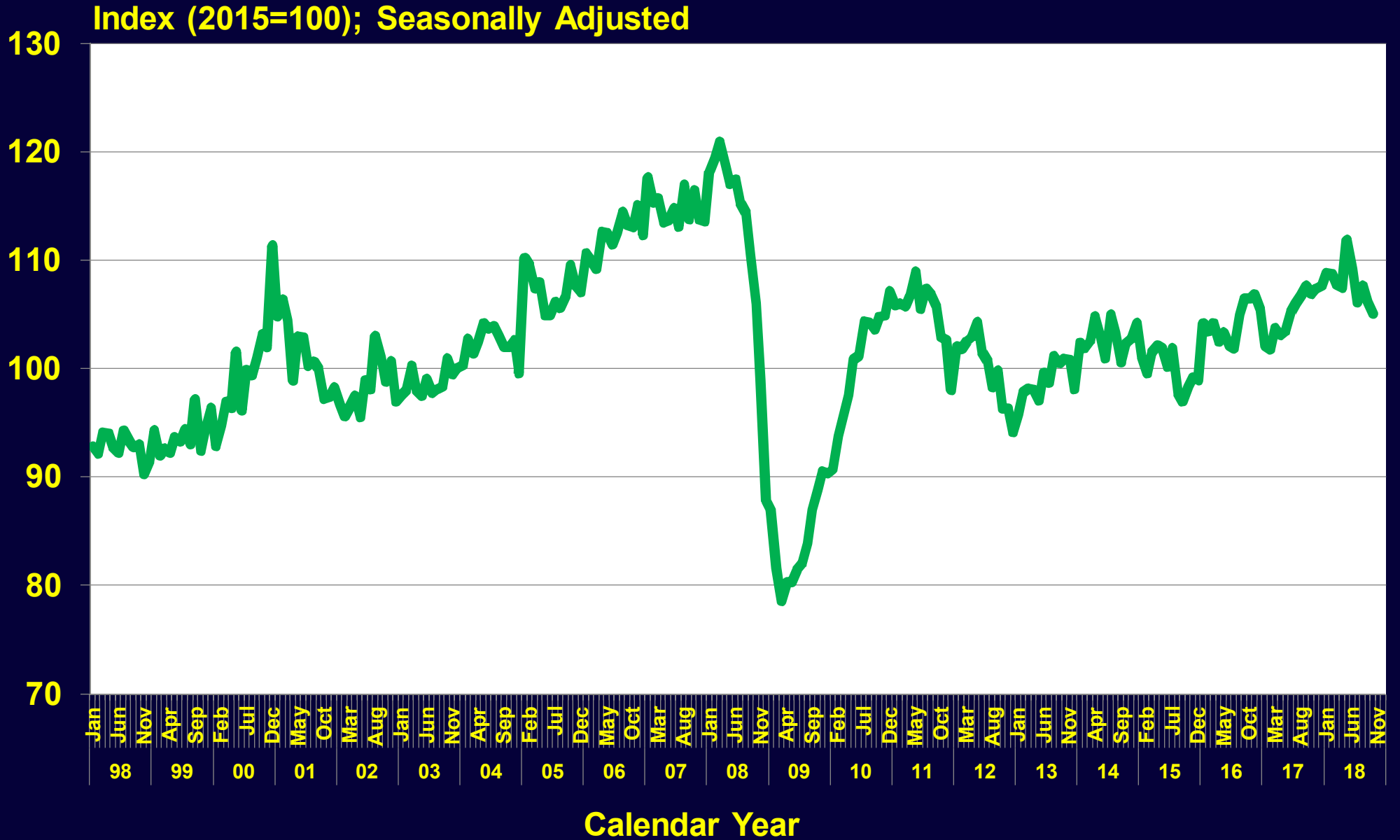


Total \$ Semiconductor Shipments from All Countries to Europe [www.sia-online.org/](http://www.sia-online.org/), Eurostat class C26, EU27, European Computer, Electronic & Optical products Production

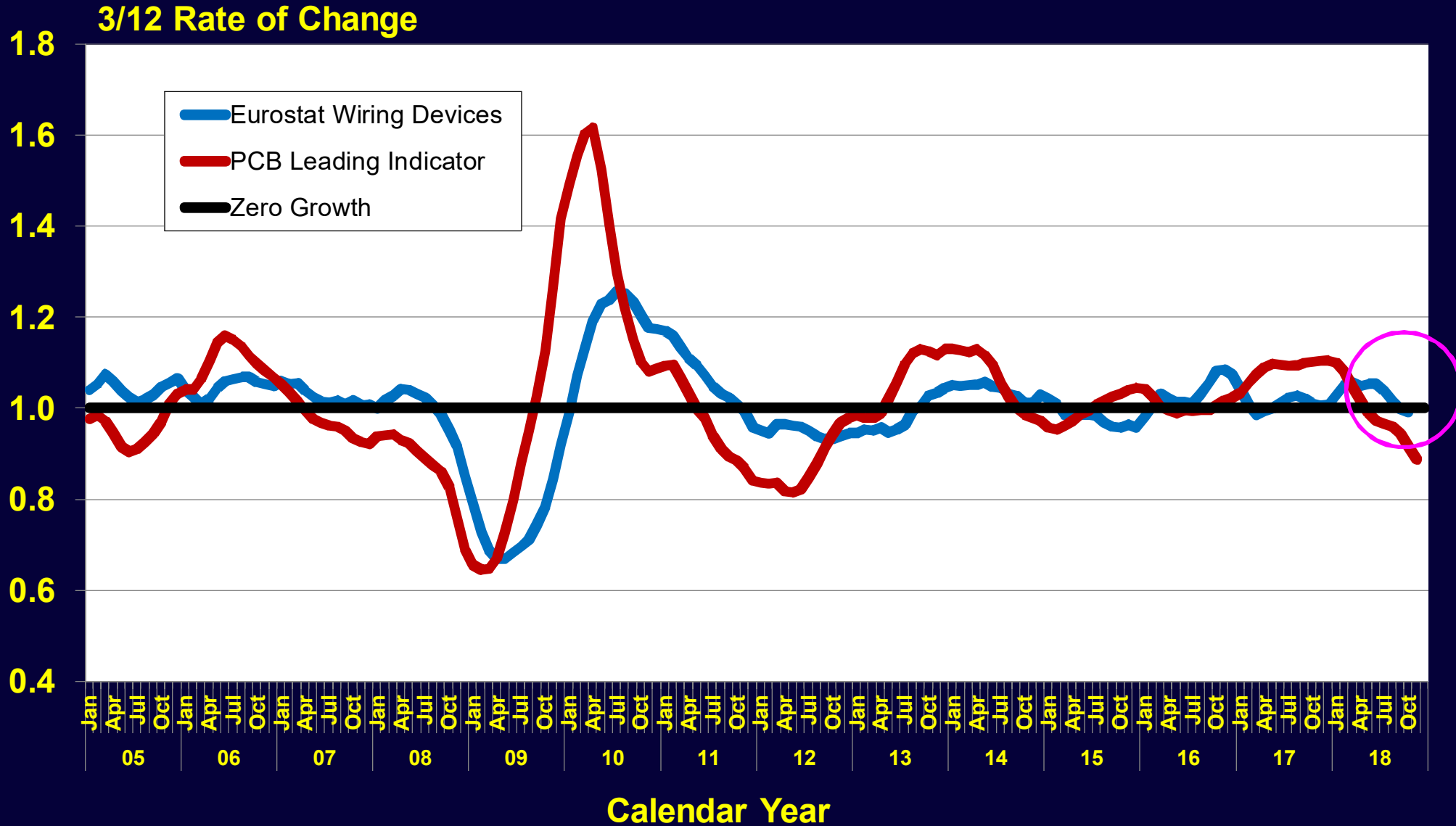
# European Loaded Electronic Board Production



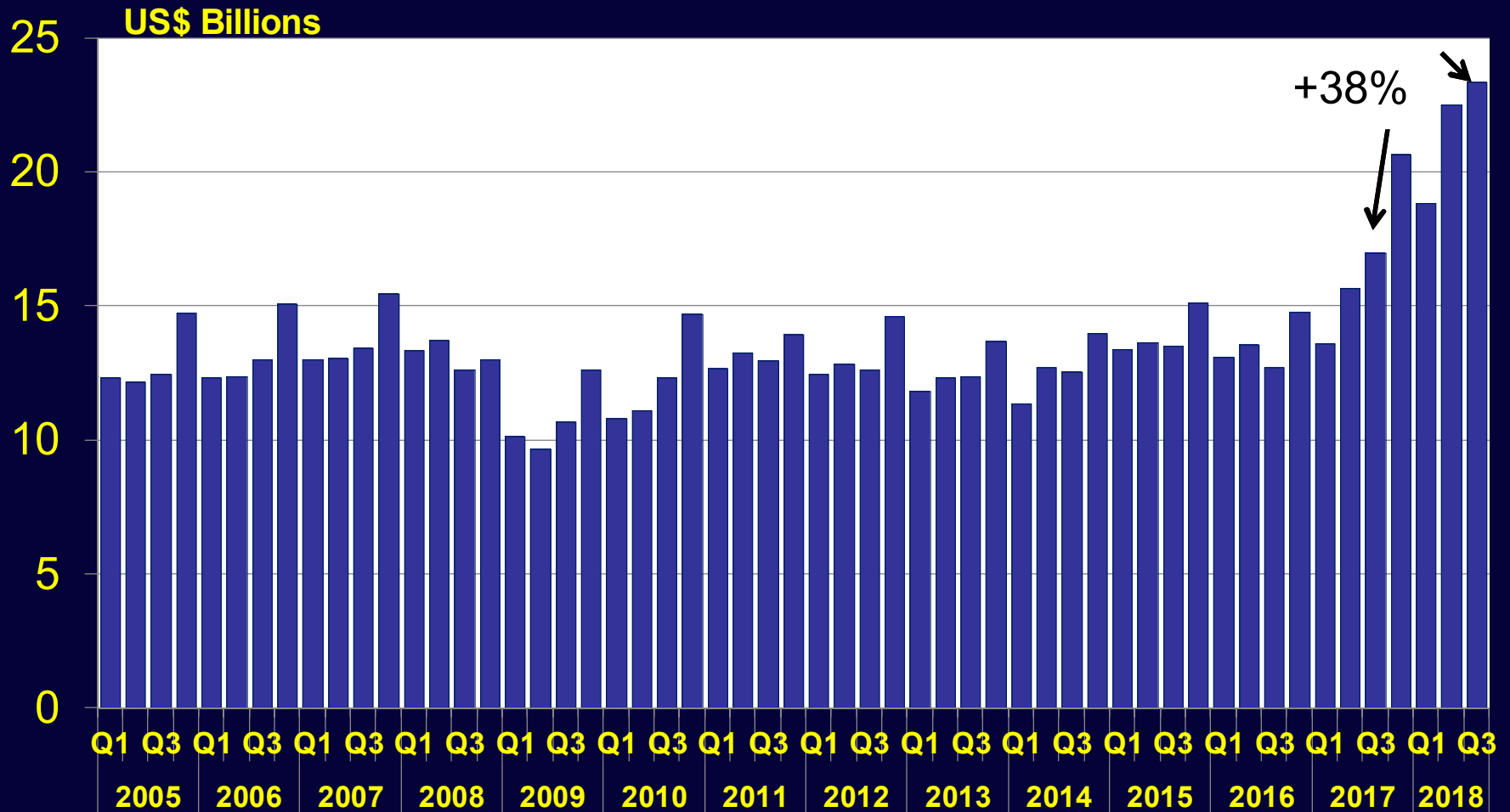
# European Electronic Wiring Devices



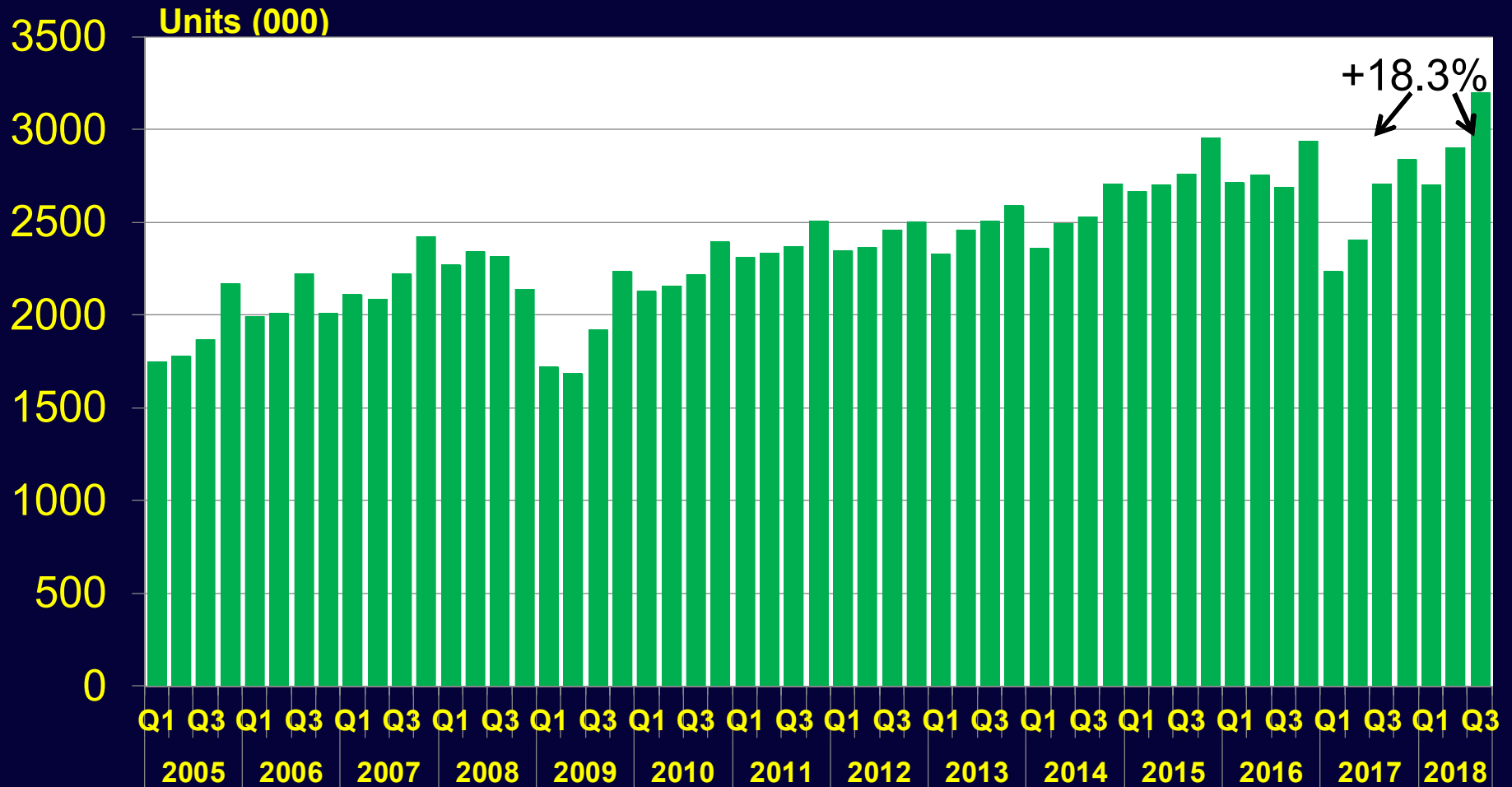
# Europe PMI Leading Indicator vs. Europe Wiring Devices



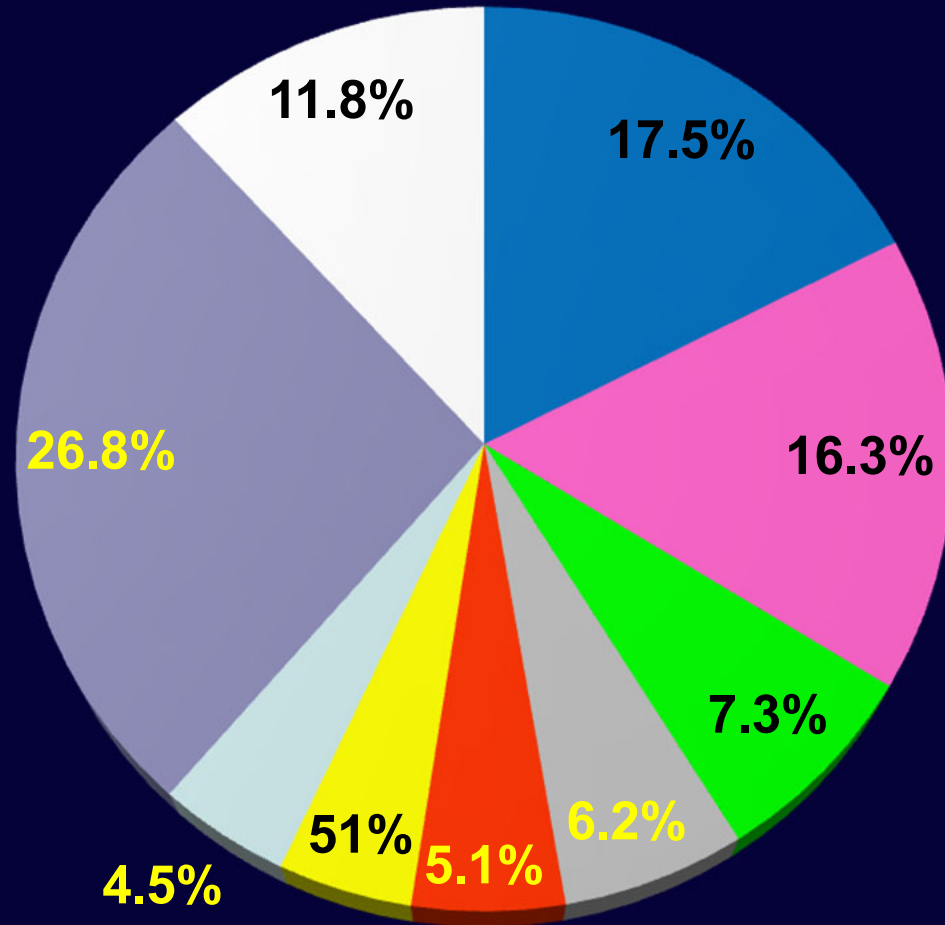
# World Server Shipment Revenue



# World Server Shipment Units



# World Server Shipments 3Q'18



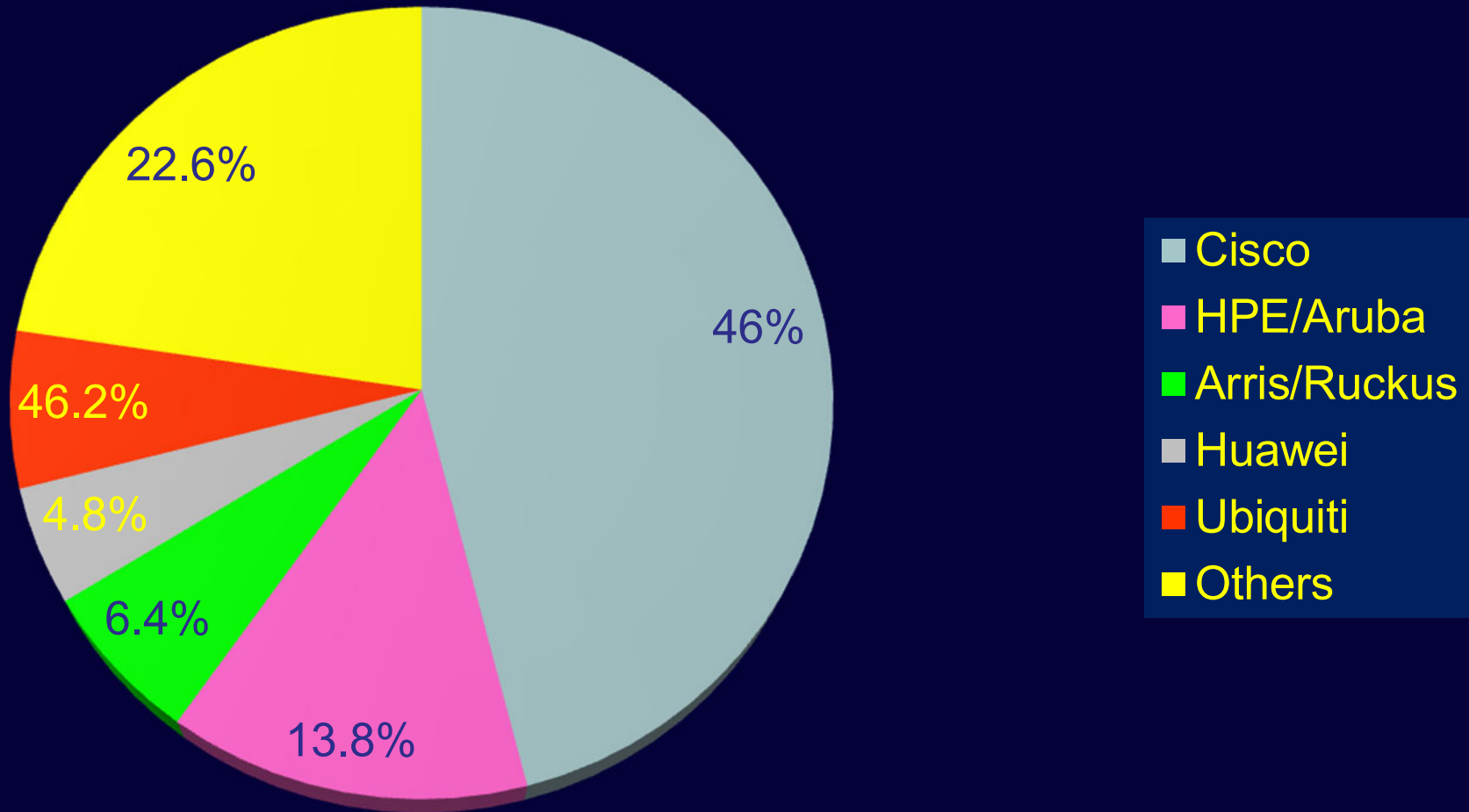
- Dell Inc
- HPE
- Inspur
- Lenovo
- IBM
- Huawei
- Cisco
- ODM Direct
- Others

**TOTAL: \$23.4 Billion**

# Enterprise WLAN Vendors

## 3Q'18

\$



**3Q'18 World Total US\$ 1.6 Billion**

# Worldwide Enterprise WLAN Revenue Companies

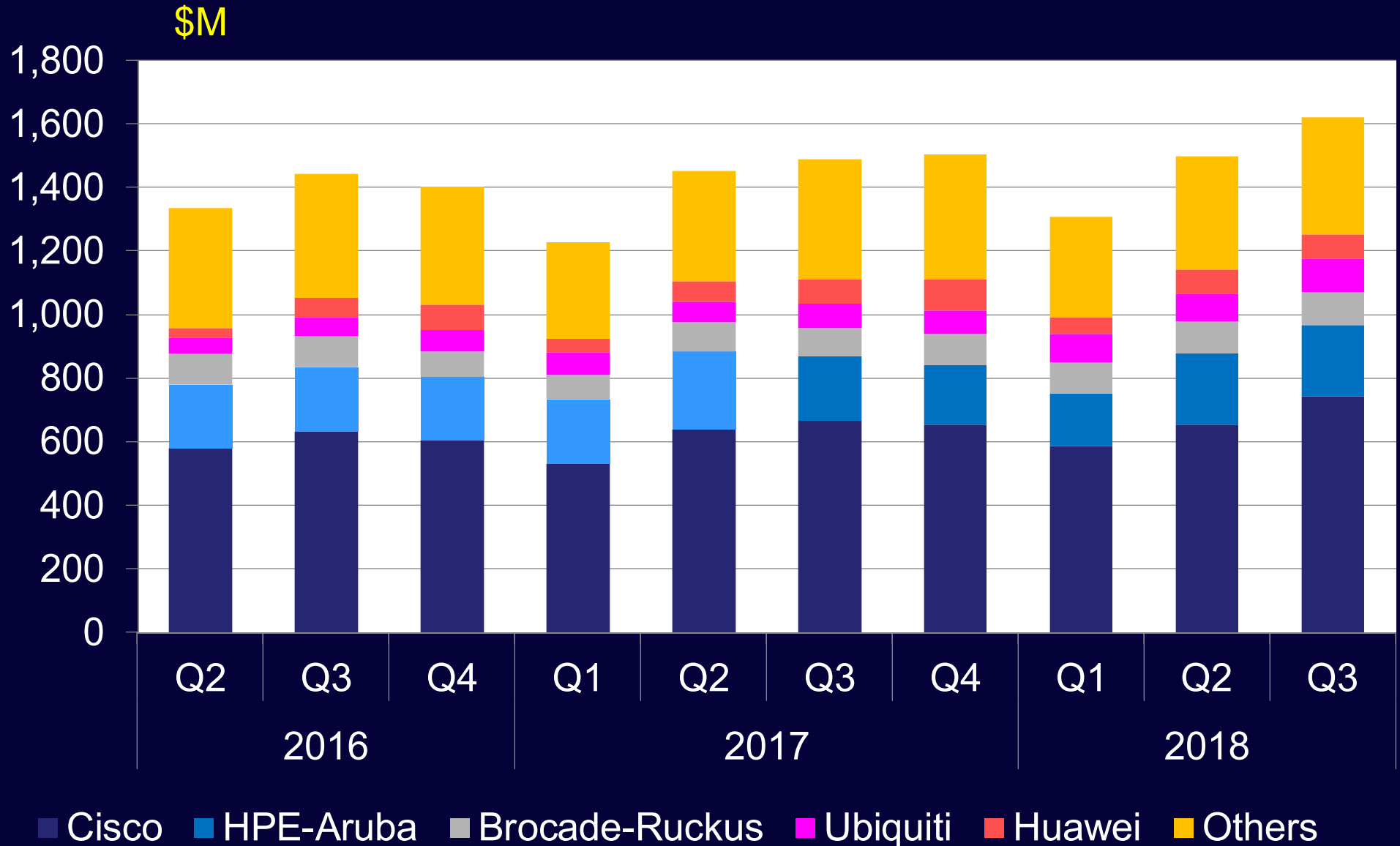
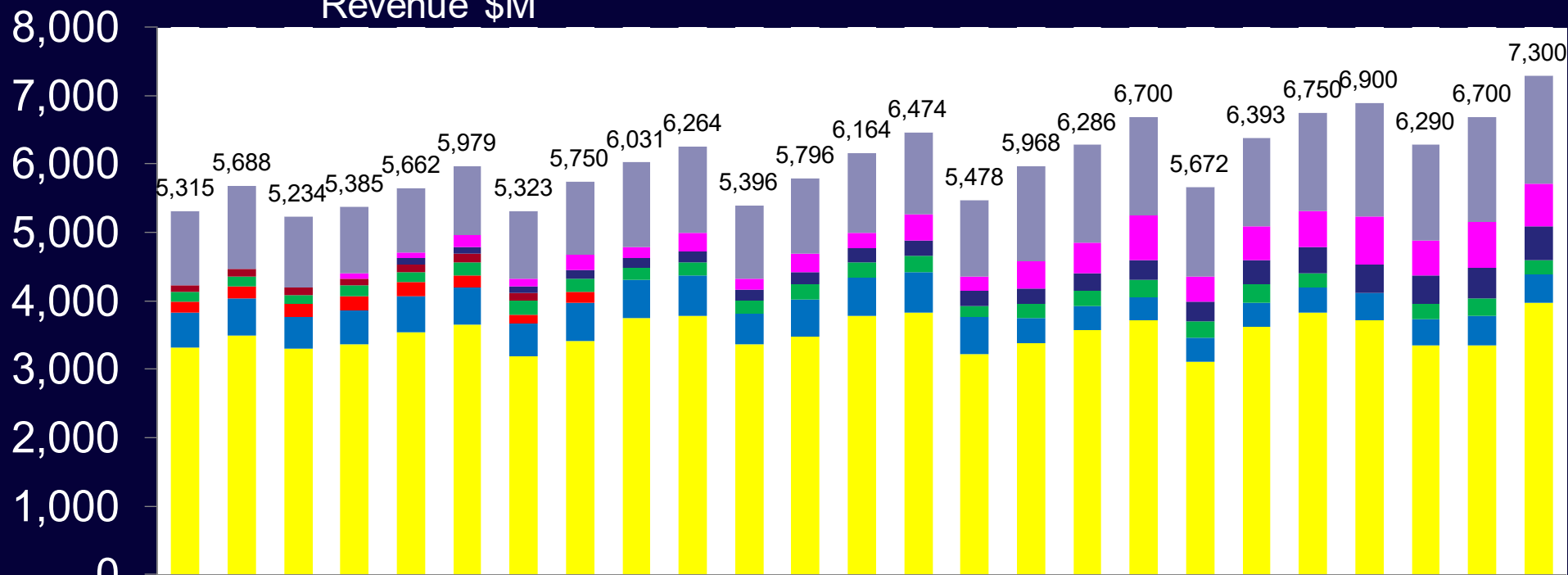


Chart 36

# Ethernet Switch (Layer 2/3) Revenues by Vendor

Revenue \$M



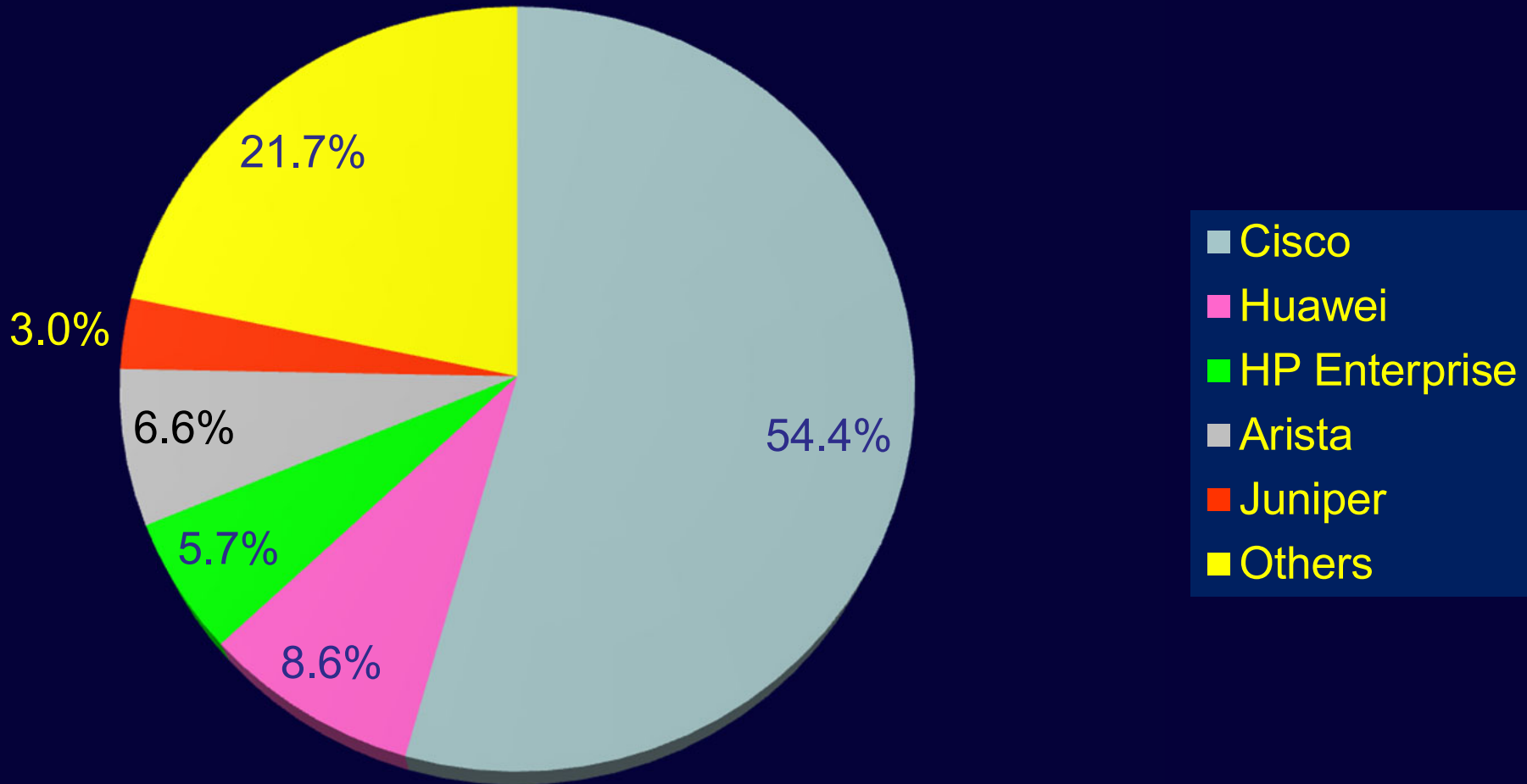
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		
	2012				2013				2014				2015				2016				2017				2018		
■ Total	5315	5688	5234	5385	5662	5979	5323	5750	6031	6264	5396	5796	6164	6474	5478	5968	6286	6700	5672	6393	6750	6900	6290	6700	7300		
■ Others	1081	1210	1024	983	954	1015	993	1072	1231	1260	1073	1101	1156	1198	1117	1385	1426	1440	1322	1297	1438	1656	1403	1541	1584		
■ Huawei				73	79	172	108	223	173	283	159	271	237	394	212	390	453	661	357	500	520	711	509	670	628		
■ Arista					87	99	101	122	140	159	160	174	193	217	212	236	254	289	289	345	378	407	409	442	482		
■ Dell	97	122	124	96	111	121	113																				
■ Juniper	143	144	130	161	151	201	200	203	165	185	187	216	231	244	174	207	222	251	250	274	216		233	255	219		
■ Alcatel-Lucent	167	173	185	199	204	163	137	147																			
■ HP Enterprise	498	533	460	508	532	552	481	569	559	587	450	553	555	593	532	360	345	337	340	352	371	407	377	436	416		
■ Cisco	3329	3507	3310	3365	3544	3655	3191	3415	3762	3791	3366	3481	3792	3828	3231	3390	3586	3722	3120	3625	3827	3719	3359	3357	3971		

IDC 1214/18 & prior 9 some values estimated from graph

# Layer 2/3 Ethernet Switch Vendors

## 3Q'18

\$



**3Q'18 World Total US\$ 7.3 Billion**

# Smartphone Platform Shipments

Units (millions)



	2018	2022
Others	0.6	0.1
iOS	210.4	217.3
Android	1209.5	1357.0

# World Smartphone Market

