

"Spotty" recovery with bright spots on the horizon



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The strength of this spring's "recovery" varies by region. Chart 1 provides the most recently available (in mid-April) 3-month average growth rates for electronic equipment shipments in four key geographic regions.

Region	Latest Month	3/12 Growth
USA	Feb	- 2.1 %
Europe	Feb	+1.2 %
Japan	Jan	-22.4 %
Taiwan*	Mar	+12.7 %

*often with China manufacturing

The USA is gradually improving, Japan continues to struggle, SE Asia is experiencing both seasonal and real growth and Europe (which typically lags the global business cycle) is slowing.

Taiwan OEMs began their normal seasonal upturn coupled with real growth in March with their 1Q'12 sales up 12.7 percent compared to 1Q'11 (Chart 2). However the recent softening in mainland China's PMI leading indicator suggests that SE Asia's 2Q'12's real growth may not accelerate this quarter.

Bright spots in our current "spotty" recovery include.

- U.S. electronic equipment orders and shipments are gradually increasing (Chart 3).
- Personal computer sales are growing again (Chart 4) and of course media tablet and smart phone demand is very strong.
- Chip foundry sales have rebounded suggesting that global semiconductor shipments will soon follow (Chart 5).
- Taiwan based solar/photovoltaic companies reported their first significant sales increase since late 2010 (Chart 6).
- Large ODM companies had a +17 percent growth in 1Q'12 vs. 1Q'11 (Chart 7).
- N American PCB order and shipment growth is increasing significantly (Chart 8).

2012 still looks like a year of a modest first half global expansion (with significant regional growth variances), and then accelerating world demand in the second half.

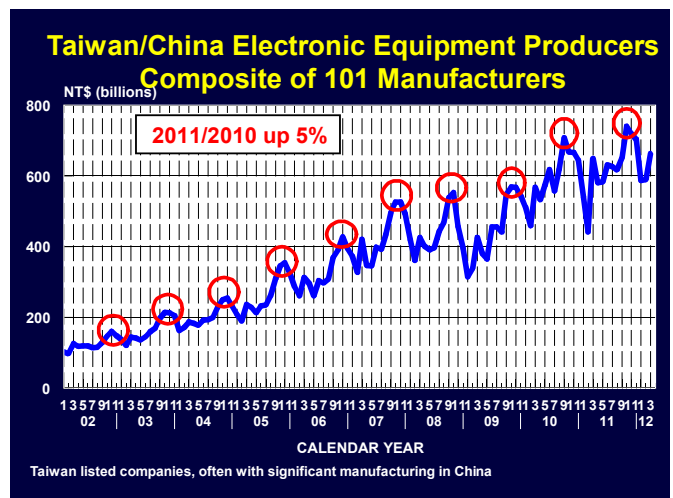
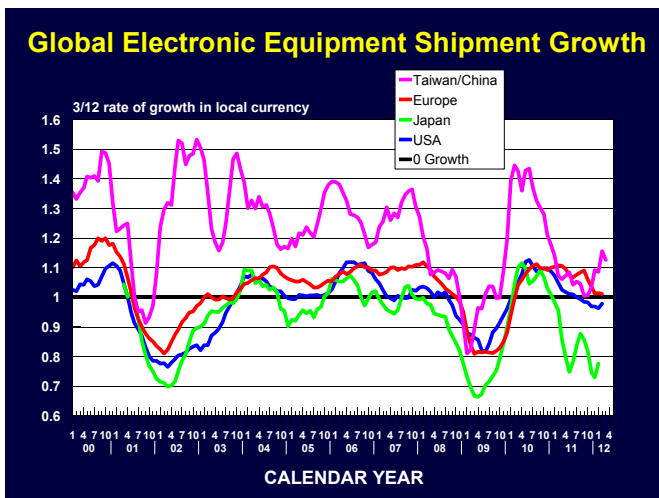
End Markets

General

- Worldwide IT spending is forecast to increase 2.5 percent y/y to \$3.7 trillion in 2012. Emerging markets will generate \$1.22 trillion of this spending, over 31 percent of the world total. —Gartner
- China's middle class (with income between \$16,000 and \$34,000) will reach 51 percent of its population by 2020. —McKinsey report

Computers & Peripherals

- World PC shipments are expected to grow from 1.8 percent y/y in 2011 to 5.0 percent in 2012; 1H'12 to have modest growth and 2H'12 will be strong on ultrabooks, ultra-thin notebooks and the launch of Windows 8. —IDC
- Global PC shipments grew 1.9 percent y/y to 89 million units in 1Q'12. —Gartner
- Worldwide notebook shipments from top-tier Taiwanese ODMs are forecast to grow 8 percent in 2Q'12 to 39.8 million units. —Barclays Capital
- Worldwide factory revenue for high performance computing technical servers increased 8.4 percent y/y in 2011



- to \$10.3 billion. —*IDC*
- Worldwide media tablet sales are projected to increase 98 percent y/y to 118.9 million units in 2012. —*Gartner*
- Worldwide media tablet shipments rose 56.1 percent q/q to 28.2 million units in 4Q11. —*IDC*
- Worldwide HDD unit shipments declined 4.5 percent y/y in 2011 but are expected to grow 7.7 percent y/y in 2012. —*IDC*

Mobile Communications

- Mobile phone shipments will grow 8.2 percent y/y to 1.7 billion units in 2012. —*IDC*
- Smart connected devices shipments will grow from 916 million units in 2011 to over 1.1 billion in 2012. —*IDC*

Consumer Electronics

- Global TV shipments fell 0.3 percent to 247.7 million units in 2011 after 6 consecutive years of growth. —*DisplaySearch*
- Smart home system hardware will grow from \$3 billion in 2011 to \$4.8 billion in 2012. —*Strategy Analytics*

EMS, ODM & Related Assembly Activity

EMS total available market penetration is expected to grow at 8.2 percent CAGR from 22.6 percent in 2011 to 26.9 percent by 2016. —*New Venture Research*

Bob Willis’ PiHR technology handbook for the circuit board assembly process is available for free download at <http://pihrtechnology.com/>

3CEMS expanded its clean room facility to 8,000 m2 in Southern China.

BGM Engineering added Europlacer iineo II pick & place equipment.

Bittele Electronics partnered with CEM Xptronics to provide quick turn prototype services in N America.

Computrol installed a KISS 103 selective solder system and a PVA650 robotic dispenser in Meridian, Idaho.

Creation Technologies moved to a 79,085 SF building in Santa Clara, California.

CTS restarted its previously flooded EMS operations near Bangkok, Thailand.

Digicom Electronics moved to a larger facility in Oakland, California.

EI Microcircuits is building a second manufacturing facility in Mankato, Minnesota.

Elcoteq Tallinn named Kalle Kuusik as GM.

Electronic Manufacturing Solutions installed a second Panasonic MV2F at their plant in Thatcham, Berkshire.

Enics Slovakia named Jan Kotkam as GM.

Escatec consolidated two existing SMT lines into a new single line based on an ASM-Siplace system in Heerbrugg, Switzerland.

Firstronic named Maria del Pilar Acosta Rice Operations Manager.

Flextronics

- acquired Stellar Microelectronics.
- appointed Lay Koon Tan, president and CEO of STATS ChipPAC to its Board of Directors.

Foxconn/ Hon Hai

- acquired a 10.95 percent stake in Sharp.
- began ODM production of second-generation smartphones for Xiaomi.
- is the world’s 10th biggest employer with 1.2 million on payroll.
- raised wages in China for third time.
- is building high-tech manufacturing base in South China’s island province of Hainan.

HEI added an Orbotech Paragon 9800 LDI system, Ultra Discovery AOI system and InPlanFlex and GenFlex CAM/ Engineering software in Tempe, Arizona.

Jabil cut 600 jobs in Kwidzyn, Poland.

Kitron is investing Eur 4.9 million to double the size of its Lithuania facility.

Libra Industries named Phil Jones Director of Manufacturing.

Nam Tai Electronics appointed Wang Lu Ping CEO and Wang Shi Ping Vice CEO.

OPSOL spent £100,000 for an additional assembly line in Cramlington, UK.

Plexus is constructing 280,000 SF manufacturing facility in Oradea, Romania.

Raven Industries repositioned its Electronic Systems Division’s assets and team members into its Aerostar and Applied Technology divisions.

Richardson Electronics named Daniel Nickolai VP of Manufacturing.

S2S Electronics acquired a 45,000 SF warehouse in Rotherham, UK.

Sanmina-SCI received a contract to produce and assemble optical control systems for Catch the Wind Ltd.

SigmaTron installed Agilent Technologies’ i1000D DTS and TS-8900 test equipment.

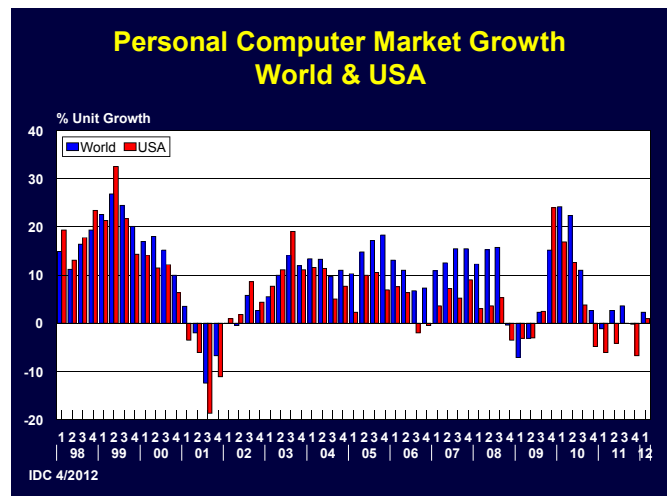
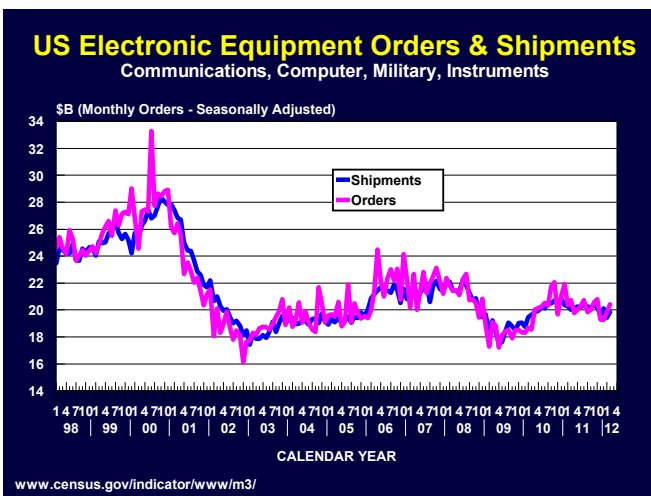
Sigura added Mydata MY100LXe14 and MY100LXe10 pick & place machines.

SMT Hautes purchased a Universal Instruments’ Advantis AC-90T platform for Montreal, Canada facility.

Suntron Phoenix’s facility became cGMP compliant and FDA registered.

TechniSat Digital added a DEK’s Horizon 02iX printing platform.

Venture Corporation’s Malaysia facility acquired Oclaro’s Shenzhen, China final assembly & test operations.



PCB Fabrication

China's PCB output in 2011 was approximately \$24.5 billion. —*Dr. Hayao Nakahara*

Electronic Design Automation industry revenue increased 12.8 percent for Q4'11 to \$1700.1 million; PCB & MCM revenue of \$139.7 million decreased 15.6 percent y/y. —*EDA Consortium*

Taiwan's PCB industry is expected to outgrow the world's predicted 6.5 percent PCB growth in 2012. —*Taiwan Printed Circuit Association*

Advanced Circuits achieved MIL-PRF-31032 certification.

Apex Circuit broke ground on new PCB factory in Thailand.

Bay Area Circuits began offering PCB layout services.

BBG hired David Duross as Engineering Director.

Chemitalic Suzhou completed restructuring and changed ownership to group of investors.

Circuit Technology began representing AIM in North and South Carolina.

element14 partnered with PCB Assembly Express to provide quick design and assembly prototyping services to N American customers.

Elna improved its PCB manufacturing customization ability in order to respond quickly to its customers' needs.

Endicott Interconnect Technologies appointed David Van Rossum CFO. IPC named John Mitchell President and CEO.

Liaoyuan Joyson Electronic acquired 74.9 percent of Preh Holding and 5.1 percent of Preh GmbH.

MicroConnex added a Chemcut 547 XL 20" developer, Chemcut 547 XL dry film stripper and an Encon thermal evaporation and distillation system in its Seattle, Washington facility.

P. D. Circuits named Dennis Perry Product Engineering Technician.

PNC added Ventec's VT-901 250Tg polyimide to their internal approval and UL listing.

Prototron Circuits added a Schmall Maschinen drilling machine MX 2-24 in Tucson, Arizona.

Spirit Circuits appointed Peter Dobromylski Southern Area Sales Manager.

Sumitomo Electric Industries acquired all the shares of its FPC manufacturing subsidiary Sumitomo Bakelite Vietnam.

Teknoflex and **JAS Interconnect Solutions** entered alliance to develop exports to US.

Transline passed AS-9100 C documentation review.

Universal Science introduced formable metal-backed, thermally conductive PCBs.

Ventec Holdings Europe acquired Option Technologies Europe.

Viasystems entered into definitive merger agreement to acquire DDI.

Vulcan Electric named Normand Sirois President.

Vulcan Flex Circuit

- acquired JETI Testing.
- received a \$2.7 million flexible circuit contract from L-3 Communications, Fuzing and Ordnance Systems.

Materials & Process Equipment

ESD protection products in electronics applications will grow at a 13 percent CAGR from USD 1.4 billion in 2012 to USD 3.4 billion by 2019. —*NanoMarkets*

U.S. conductive polymers market will reach US\$1.6 billion by 2017. —*GIA AIM* appointed Circuit Technology as its North and South Carolina sales representative.

Air Products acquired DuPont's stake in DuPont Air Products NanoMaterials LLC JV.

Asahi Glass developed a micro hole drilling process for ultrathin (0.1 mm) glass sheet for glass interposers.

BTU International appointed James Yu as Director of Operations China.

Corning named David Morse CTO.

Count On Tools appointed AdoptSMT Europe as its distributor for all of Europe.

Datest was selected as a demonstration site for GOEP's OptiCon X-Line 3-D In-Line X-ray inspection system.

Dima Group added Estanflux as its exclusive distributor in Spain and Portugal.

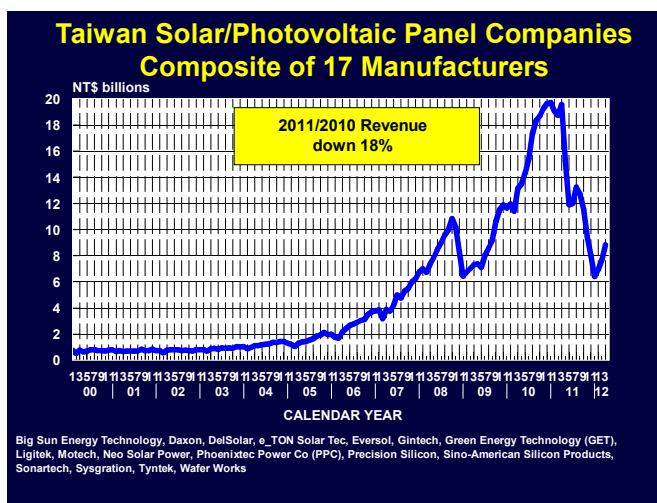
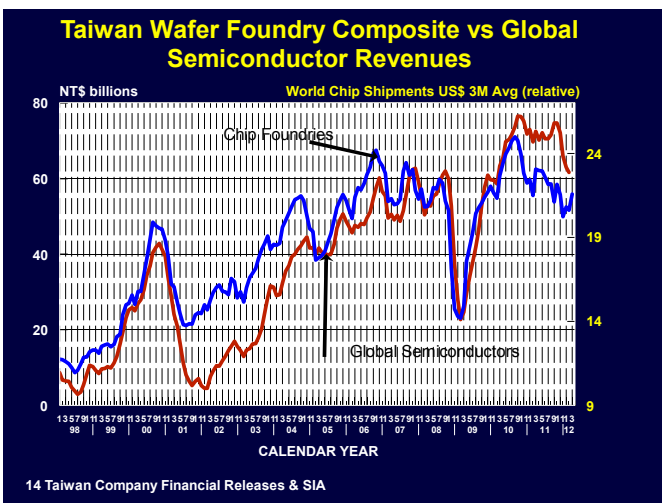
Dow Chemical opened a global R&D center for electronic materials in Hwaseong, Gyeonggi-do, Korea.

Easy Braid introduced its PARMi in-line solder paste inspection system.

Enthone appointed Joe Renda, Director-Global Market Management, PWB Final Finishes and Sean Mirshafiei VP, Global PWB Marketing.

Essemtec Brazil moved to Campinas and named Helio Queiroz, Sales Manager.

Everett Charles Technologies appointed Hidenori Onodera Business Development Manager for Japan.



Hitachi Chemical is building a copper clad laminate manufacturing facility in Hong Kong.

Hover-Davis appointed Sinerji Grup as its distributor in Turkey.

IDEX acquired Precision Photonics.

JK Lasers named Michael Haase as German Sales Manager.

Juki named W.J. Murphy Associates as its representative for New York City and New Jersey.

LPKF Laser & Electronics expanded its Shenzhen, China branch office.

Milara launched a vision system alignment and 2-D post-print inspection powered by Coherix.

Novagard Solutions introduced three NOVAGARD UV staking compounds for printed circuit board applications.

Park Electrochemical named Matthew Farabaugh VP and CFO and Stephen Gilhuley Executive VP – Administration.

PROMATION appointed Integration Alliance to market and sell its line of circuit board process equipment in Canada.

Quik-tool appointed Methods Automation as its representative for Delaware, Maryland, Virginia and West Virginia.

Rainbow Technology Systems introduced its Panda Coater for sheet and reel-to-reel materials.

Rogers realigned product development, marketing and sales resources with its printed circuit materials, high performance foams and power electronics solutions.

SEHO Systems named Elmar Schebler Director of Finance and Controls and Rainer Bogen Director of Sales and Key Account Management.

Specialty Coating Systems achieved AS9100 Revision C certification for its Parylene coating service centers in California, Indiana, New Hampshire and Wisconsin.

Taiwan

Takisawa

- inaugurated its 216,000 SF plant in Yangmei, Taiwan.
- celebrated its 40-year founding anniversary.

TRI Innovation launched a JV with Ultramex to recover tin and other metals from waste circuit boards.

Universal Instruments expanded Cope Assembly Products' customer coverage to Eastern U.S.

ZESTRON South Asia promoted James Yeoh to GM.

Semiconductors & Other Components

Worldwide semiconductor revenues grew 0.9 percent y/y to US\$302 billion in 2011 and are projected to grow an additional 4 percent in 2012. —Gartner

Worldwide semiconductor foundry market increased 5.1 percent y/y to US\$29.8 billion in 2011. —Gartner

Analog ICs, microprocessors, memory ICs, programmable logic devices and transistors represent \$169 billion in potential counterfeit risk per year for the global electronics supply chain. —IHS iSuppli

GaN power semiconductor market is forecast to grow from almost zero in 2011 to over \$1 billion in 2021. —IMS Research

Global electronic connectors market will reach US\$89.6 billion by 2018. —GIA

Global printed electronics market is expected to grow at 29.4 percent CAGR over next five years from \$3.5 billion in 2011 to \$12.6 billion in 2016.

—BCC Research

Global MEMS device market will reach US\$11.3 billion by 2017. —GIA

Global SoC market will reach US\$48.8 billion by 2017. —GIA

Top 15 semiconductor equipment suppliers grew 13 percent in 2011; ASML was No. 1 in tool sales in 2011. —VLSI

Top 25 fabless chip companies supplied 80 percent of the \$64.9 billion of global fabless IC sales in 2011, up 4 percent from 2010. —IC Insights

Worldwide PC microprocessor revenues rose 13.2 percent to more than \$41 billion in 2011. —IDC

Global organic electronics market is expected to grow at 32.6 percent CAGR from USD 8.2 billion in 2012 to USD 44.8 billion in 2018. —Transparency Market Research

Touch screen market will reach \$14 billion in 2012. —IDTechEx

Worldwide semiconductor manufacturing equipment sales grew 9 percent y/y to \$43.5 billion in 2011 and global semiconductor materials market grew 7 percent in 2011 to \$47.9 billion. —SEMI

Worldwide semiconductor manufacturing equipment spending is expected to decline 11.6 percent y/y to \$38.9 billion in 2012. —Gartner

