

Mixed results but some signs of better times ahead



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We *might* be on the verge of the much-sought-after “global recovery.”

Current world economic performance varies significantly with geography. Based upon the August PMI (*Purchasing Managers’ Indices, Chart 1*), the total world showed very modest manufacturing growth with China, Taiwan, S Korea and Japan declining and the USA and Europe improving (PMI).

World electronic equipment production growth is paralleling the world PMI. In 2Q’13 vs. 2Q’12 electronic equipment sales grew a meager 0.7% (preliminary estimate per *Chart 2*).

Second quarter pro ct growth varied significantly by sector and position on the electronic supply chain (*Chart 3*). For electronic equipment the military and data storage sectors were down while communication, Internet and SEMI equipment rose. Most component and material sectors were still in the “red” but PCB process equipment and component distributor sales expanded.

Global semiconductor sales tell a slightly different story (*Chart 4*). June chip shipments rose significantly to SE Asia and the USA and less so to Europe and Japan. Reportedly most of the Asian semiconductor shipment increase was to China. So in a time when the SE Asian PMIs were declining, their chip shipments were up. Why? Was this inventory building in preparation for the fall “busy season” or just over zealous ordering? We’ll watch the regional semiconductor and PMI data over the next few months to see if growth continues or there is a late summer downward “correction” in chip sales.

In a time when semiconductor sales are growing, SEMI equipment revenues appear to be increasing nicely (*Chart 5*). And, as shown in *Chart 2*, PCB process equipment sales are also improving. Good news for the capital equipment makers. We hope it continues.

Chart 6 summarizes the 3/12 growth of the world electronics supply chain. Electronic equipment, semiconductors and

the PMI are all barely in positive territory with PCBs lagging. However all series may be headed for improvement.

Our current recovery varies both by geography and product type but there are signs of potentially better times ahead. Keep watching the numbers!

End markets

World

- Global government IT spending is projected to fall 0.1% y/y to US\$449.5 billion in 2013.—Gartner
- Worldwide IT outsourcing market to increase 2.8% y/y in to U.S. \$288 billion in 2013.—Gartner

Country

- Brazil consumer electronics spending will grow by about 11% in US dollar terms to US\$40 billion in 2013.—BMI
- China telecom Industry IT solution market to increase 10.4% CAGR from CNY13.87 billion (US\$2.26 billion) in 2012 to CNY22.76 billion in 2017.—IDC
- Latin America, emerging Asia Pacific and Greater China IT outsourcing markets will all grow by more than 13% in 2013 and 2014.—Gartner

Mobile communications

- Mobile phone shipments grew 6.0% y/y to 432.1 million in 2Q’13.—IDC
- Smartphone shipments reached 238.1 million units in 2Q’13; Top five vendors in China accounted for 20% of global smartphone shipments. – Canalys
- Mobile wireless accessory shipments are forecast to grow from 18 million in 2013 to 170 million by 2018.—Juniper Research

Computers

- Western Europe PC market shipments fell 19.8% in 2Q’13 to 10.9 million units.—Gartner
- Notebook shipments increased 0.4% q/q to 39.4 million in 2Q’13.—WitsView
- PC and tablet combined shipments will grow 7% y/y to 493.1 million units in 2013.—Canalys
- Branded tablet shipments grew 47% y/y to 36.2 million units in 2Q’13 with Android holding 67% market share.—

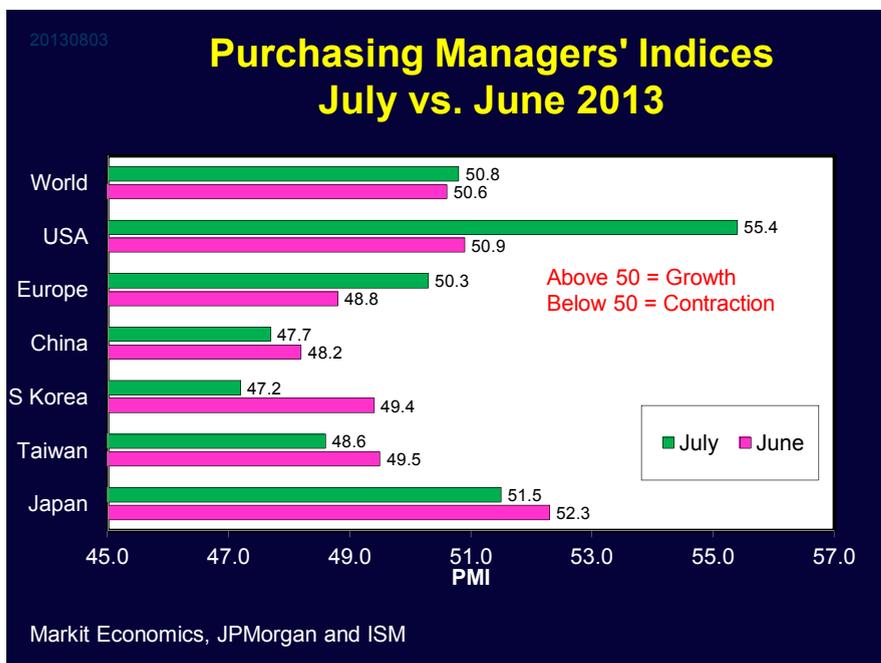


Chart 1.

Strategy Analytics

- Tablet shipments are expected to rise 69% y/y to 260 million units in 2013.—NPD DisplaySearch

Peripherals

- Computer graphics hardware market is expected to grow from more than \$107 billion in 2013 to over \$142 billion by 2016.—Jon Peddie Research
- Embedded system market is forecast to grow at a 6.8% CAGR from USD 121 billion in 2011 to USD 194.27 billion in 2018.—Transparency Market Research
- Mobile PC thin (5mm and 7mm) combined HDD shipments are expected to increase from 5 million units in 2012 to 133 million units by 2017.—IHS
- Power supply market to grow by 2.4% in 2013 after disappointing 2012.—HIS
- SSD shipments increased 92% y/y from 6 million units to 11.5 million units in 1Q'13.—HIS

Consumer electronics

- Digital camera shipments are expected to contract 28% to 71 million units in 2013; Taiwan's shipments will fall 39.4% to 24 million units in 2013.—Digitimes Research
- Set-top box shipments used for cable, satellite, terrestrial and IPTV digital TV services are forecast to grow 8% y/y to 269 million units in 2013.—HIS

Other

- Automotive wireless market is expected to grow from \$1.1 billion in 2012 to \$1.6 billion in 2018.—IHS
- Consumer Wi-Fi customer premises equipment shipments increased 16.8% y/y to 43.3 million units in 1Q'13.—ABI Research

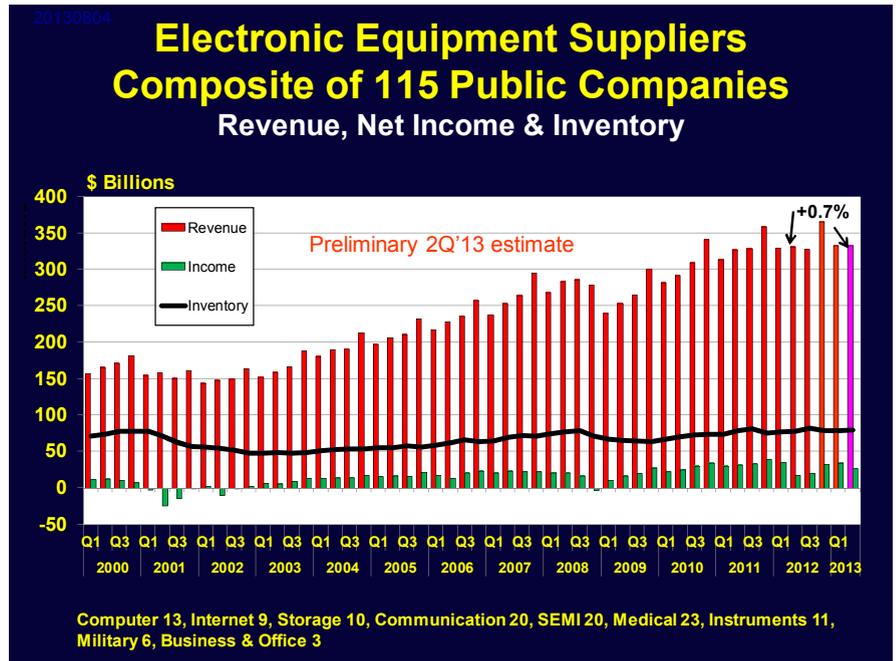


Chart 2.

- Enterprise and consumer femtocell market will increase from 3.8 million units in 2013 to 5.7 million units in 2014.—ABI Research

EMS, ODM & related assembly activity

AlphaEMS completed the process for ISO 14001 environmental management certification.

API Technologies received ISO 13485:2003 medical certification and AS9100 Rev C

aerospace certification for its EMS business.

Calsonic Kansei Mexicana purchased two ULTIMA STR2 selective solder systems and an ULTIMA SSP selective fluxer from Manncorp.

Conelec Electronics Manufacturing appointed Michael Sobolewski, President and COO.

Creation Technologies Design Services opened a 10,000 SF Milwaukee design center.

Exception EMS upgraded its training facility and began offering IPC training courses externally to its customers.

Flextronics established its Lab IX accelerator program in Milpitas, California to support early-stage disruptive technology companies

Foxconn/Hon Hai

- is building a high-tech production base in Guizhou, China.
- raised age requirement for recruitments from 18-40 to 23-40.
- workers at its Zhengzhou factory in China went on strike over hours and quality control training.
- plans to finish developing high-precision LCD monitor for use in surgical robots by March 2014.

recurring 90,000 workers in Shenzhen, China.

Inission acquired 28,500,000 shares (26% of the total share capital) in Incap.

Kimball Electronics' Nanjing, China facility achieved ISO 13485 certification for medical device manufacturing.

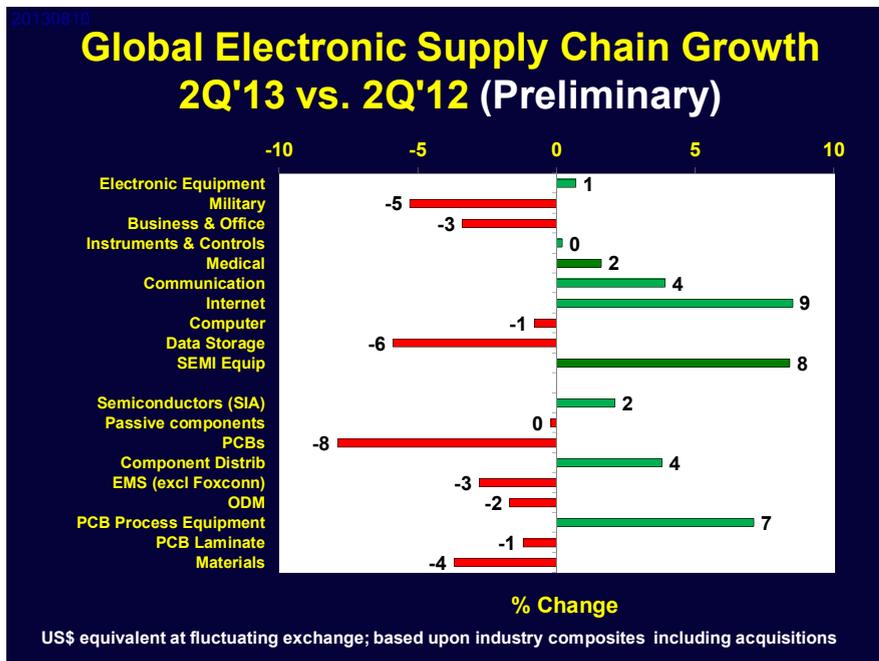


Chart 3.

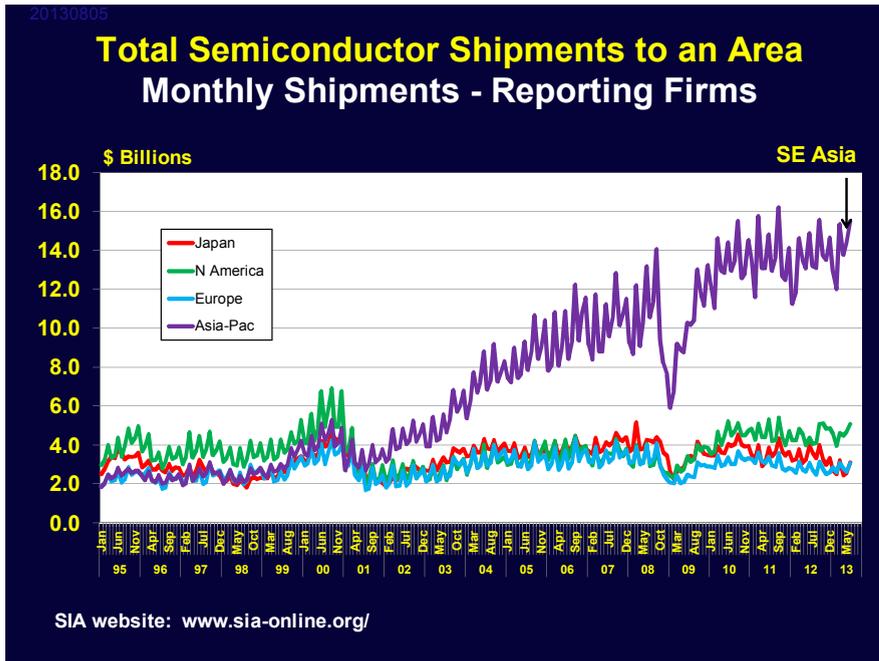


Chart 4.

Kyrel added two Universal Instruments FuzionXC2-60 and FuzionXC2-37 production lines.

Microtech added an iineo system from Europlacer.

NBS moved its manufacturing HQ to 60,000 SF facility in Milpitas, California. Premier Manufacturing added a ProfitKey International ERP Management System.

RBB Systems celebrated its 40th anniversary.

Ryder Industries expanded its Coastal I factory by 10,000 m2 in Shenzhen, China.

Sanmina Board of Director Jean Manas retired.

SMS Electronics

- appointed Chris Johns to Head of Technology.
- received AS9100 Quality Management certification.

SMTC appointed Frederick Wasserman to its Board of Directors.

TeligentEMS achieved ISO 13485 certification.

Toshiba completely shifted its notebook production from its ODM partners' plants in coastal cities to China's western inland areas.

Union Precision Industry upgraded its SMT and DIP line production capabilities in Arcadia, CA to 5,500,000 components per day and the DIP line production capability to 384,000 components per day.

PCB fabrication

Brazil has less than 30 PCB makers with a total production value of \$40-50 million

per year.—Dr. Hayao Nakahara
PCB & MCM EDA revenue increased 6.7% y/y to \$157.2 million in 1Q'13.—EDAC

North American cumulative rigid PCB sales to the military market from January through May 2013 were up 3.4% y/y.—IPC
Worldwide PCB manufacturing will grow 3% annually from US\$59 billion in 2012 to US\$60.4 billion in 2013 and US\$66.6 billion in 2016.—Dr. Hayao Nakahara.

Note: Custer Consulting Group believes that 3% PCB growth in 2013 may be optimistic.

Apex began commercial operations at its second plant (with production capacity of 300,000 SF of PCBs/ month) in Thailand.

Asian Circuits expanded Shenzhen, China to over 35,000 SF and added new state-of-the-art assembly and testing equipment.

Cambridge Circuit installed a Pentagal HASL unit in Milton, UK.

Chin-Poon is investing NT\$3.26 billion (US\$109.2 million) to expand capacity over next four years.

Daeduck is building a rigid-flex board plant in Korea.

Endicott Interconnect completed and passed several critical re-certifications including AS/EN/JISQ9100:2009—Revision C, ISO 9001:2008, and ISO 13485:2003.

Hi-Tech changed their processes from screen printing to spraying with addition of an all4-PCB spraying machine and ELPIMER® Solder Resist AS 2467 SM-DG. Interflex built a one million SF FPC plant in Korea and a 300,000 SF plant in China.

Invotec Group developed PCBs for Alphasat, Europe's most sophisticated communications satellite.

IPC and **JPCA** released electronics manufacturing industry's first design guidelines for printed electronics.

Kyocera acquired Toppan-NEC Circuit Solution.

National Research Council installed a SPEA Flying Probe 4060 tester.

Omni Circuit Boards developed an aluminum trace circuit board for quantum computing applications.

Screaming Circuits celebrated its 10th Anniversary.

SMG-Global Circuits plans to expand its Chartiers Township plant and doubled the size of its staff from 21 to 47 as a result of the acquisition of Global Circuits in Oakmont.

Somacis

- spending Euro 7 million to expand and update its USA and Italy plants.
- received Nadcap merit status for electronics at its Italian facilities.

Stevenage Circuits added Taiyo's IJR-4000 FW100 for use with its Orbotech Sprint 120 inkjet printer.

Varioprint purchased an InPlan Flex engineering system developed by Frontline PCB Solutions.

Viasystems Anaheim and Milpitas were certified to produce PCBs using Integral's Zeta® glass-free laminate and film solutions.

Materials & process equipment

ACD appointed Kurt Orr and Ralph Peterson as Senior Account Managers

ACE Production Technologies opened a Midwest demo facility in Indianapolis, Indiana.

Ames Goldsmith appointed Frank Barber, President & CEO and Randy Klein, Global Sales and Marketing Director.

Atotech celebrated its 20th anniversary.

Cambridge Nanotherm named Keith McDonald, Sales and Marketing Director.

Chime Ball Technology acquired 12.1% stake in Maskless Lithography.

Data I/O named Rajeev Gulati, CTO.

DKN Research developed a series of screen-printing technologies to generate fine line silver conductors down to 30 microns on thin plastic films.

DNP

- began operations at DNP Fine Chemical Utsunomiya.
- developed electrode film by chemical etching thin copper layer on PET film for touch screen applications.

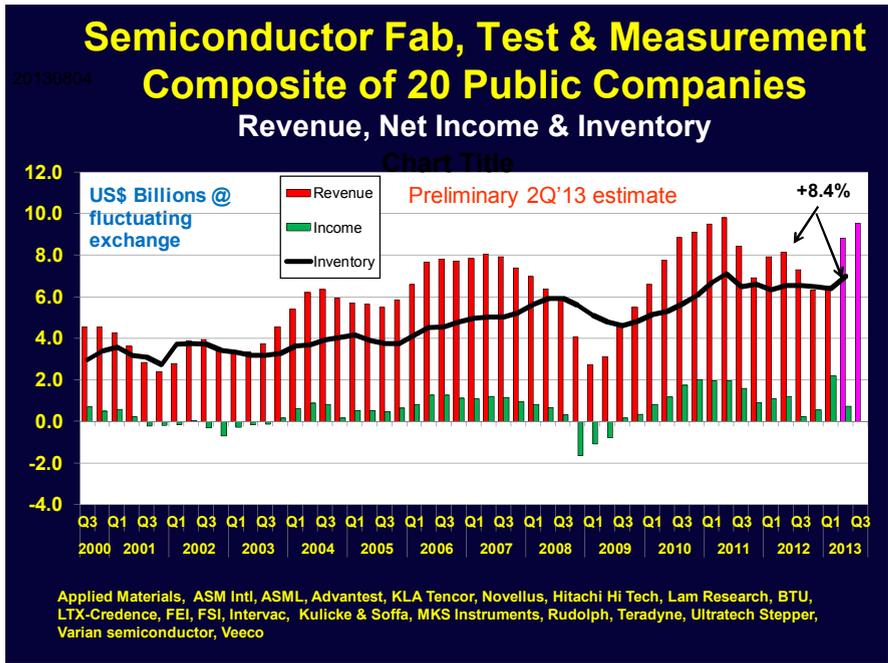


Chart 5.

Dow Chemical CTO and Executive VP, Bill Banholzer retired.

DuPont and **IQLP** entered collaboration to develop and refine liquid crystal polymer thin-film technology for use in high-speed circuit applications.

Enthone introduced ENPLATE® Onyx™ black, mid-phos electroless nickel process. **GVD** received a \$300,000 Massachusetts Small Business Innovation Research contract to develop environmentally-friendly, ultra-thin mold release coatings for PCBs.

Henkel and **Cavist** began offering local prototyping for low-pressure injection molding in Madison Heights, Michigan.

Indium and **Duksan Hi-Metal** formed strategic alliance for SACM solder ball manufacturing and distribution.

Integral Technology verified the durability and resilience of its Zeta® ultra-thin dielectric films in PCBs.

Isola

- added two additional hot oil presses, semi-automatic layup lines and an additional cleanroom in Suzhou, China.
- joined the Electronic Industry Citizenship Coalition.

Lackwerke Peters was certified as Authorized Economic Operator Full—Customs Simplifications/Security and Safety.

MIRTEC appointed Brian D’Amico, President of MIRTEC’s Industrial Camera Division, ISVI Corporation.

Murray Percival Company appointed Matthew Percival, Personal Account

Executive for the Eastern Michigan territory.

Nordson acquired Kreyenborg’s polymer processing companies.

Panasonic Factory Solutions appointed Bill Marca, North East Regional Sales Manager and Brent Fischthal, Senior Manager of Product and Solutions Marketing.

Park Electrochemical Board of Director Lloyd Frank retired.

Rogers

- appointed Ganesh Moorthy to its Board of Directors.
- and Northeastern University launched joint innovation center to co-develop innovative materials solutions.

Rudolph Technologies appointed Klaus Ruhmer, Lithography Sales Director.

SCHMID Zhuhai received ISO14001:2004 certification for its environmental management system.

Schneider Electric acquired Invensys. SMTA launched online re-certification program for engineers whose 10-year SMT Processes Certification is expiring.

Tektronix opened new calibration laboratory in Chengdu, China.

Veeco Instruments was granted request for continued listing on The NASDAQ Stock Market until November 4, 2013.

Vitronics Soltec shipped first XPM3m reflow oven made in Suzhou China.

Semiconductors & other components

Global semiconductor sales in 2Q’13 rose 2.1% y/y to \$74.65 billion.—WSTS

Worldwide semiconductor revenue is expected to grow 6.9% y/y to \$320 billion in 2013.—IDC

Top 20 semiconductor companies’ sales increased by 4% y/y to a total of 110.45 billion in 1H13.—IC Insights

Semiconductor manufacturing equipment market will fall 1.7% y/y to \$36.29 billion in 2013, but will bounce 21% to \$43.98 billion in 2014.—SEMI

North America-based manufacturers of semiconductor equipment posted \$1.33 billion in orders worldwide in June 2013 (3-month average basis) and a book-to-bill ratio of 1.10.—SEMI

Automotive

- IC market will grow 11% annually from \$18.2 billion in 2012 to \$27.7 billion in 2016.—IC Insights
- MEMS revenues are forecast to increase 9.2% y/y to US\$2.8 billion in 2014.—IHS

Bluetooth-enabled devices are expected to grow from 3.5 billion in 2012 to almost 10 billion by 2018.—ABI

DRAM market capital expenditures are forecast to reach US\$4 billion in 2013.

DRAM prices rose 42% y/y in 2Q’13.—IC Insights

German component distribution market grew 2.3% y/y to EUR 712 million in 2Q’13.—FBDi eV

Global LED precursor demand will increase 114% from 32 tons in 2012 to 69 tons in 2016.—Displaybank

LED

- driver ICs in LED lighting is expected to grow from US\$214 million in 2012 to US\$323 million in 2013.—IMS Research
- wafer fab equipment spending will rise 17% y/y to nearly \$1.2 billion in 2014, following a 30% decline in 2013.—SEMI

MEMS sensor market for mobile phones and tablet computers will grow from \$2.2 billion in 2012 to \$2.7 billion in 2013.—Yole Développement

OEM chip spending will rise 4.2 y/y to \$265.2 billion in 2013.—IHS

World’s top 100 connector manufacturers recorded shipments of USD 47.610 billion in 2012.—Bishop & Associates

Walt Custer is an independent consultant who monitors and offers a daily news service and market reports on the PCB and assembly automation and semiconductor industries. Jon Custer-Topai is vice president of Custer Consulting Group and responsible for the corporation’s market research and news analysis activities.