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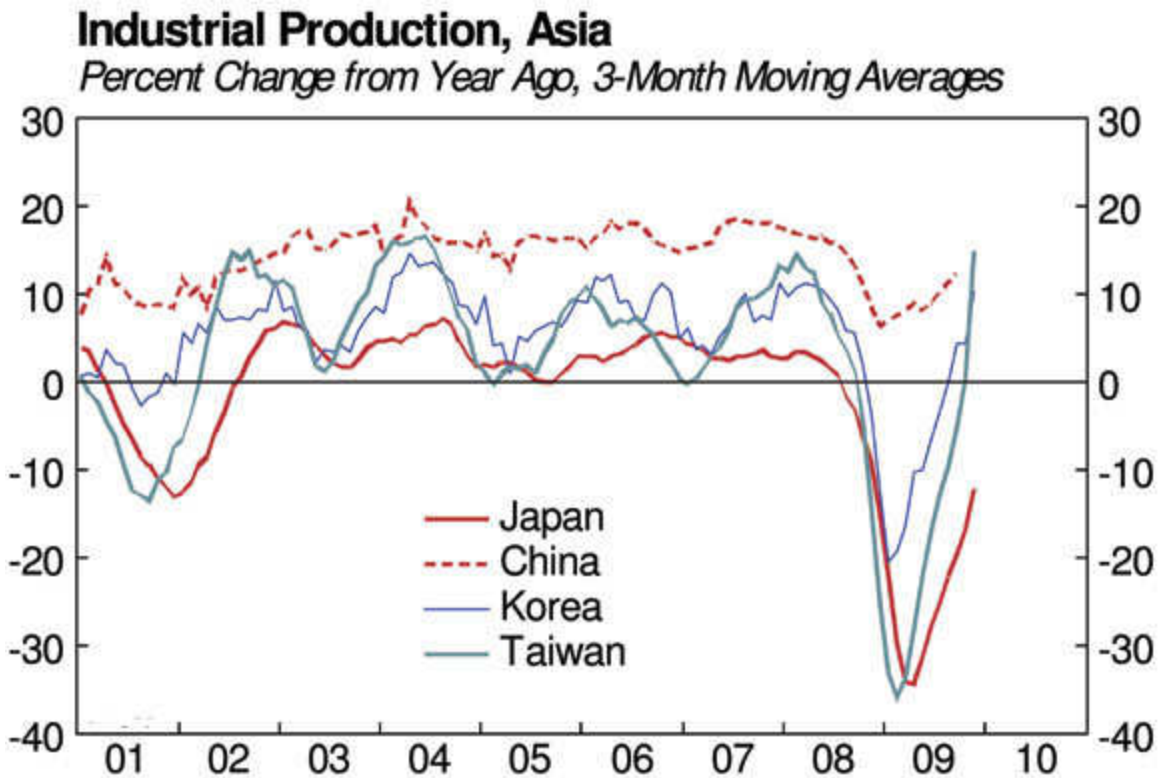
China Leads World Out of Recession, Through Recovery

Dominating much of the discussion this week at the Industry Strategy Symposium (ISS) in Half Moon Bay, Calif., China has been repeatedly pointed to as a major driver in recovery -- for the semiconductor industry, PV and flat panel displays. It was the first country to recover, and its government has built initiatives that will drive considerable demand.

By Aaron Hand, Editor-in-Chief -- Semiconductor International, January 14, 2010

Perhaps the most talked about topic this year at SEMI's Industry Strategy Symposium (ISS) was China, and its tremendously growing impact on the world's semiconductor industry. As industry analysts turned their eyes toward a market recovering from one its worst economic downturns, they repeatedly pointed to the Asian behemoth as a growing factor in a global picture.

Several analysts noted that it was in fact China that led the world and the semiconductor industry out of recession and into recovery. China's economy began turning up in December 2008, according to Robert Fry, senior associate economist at DuPont, and it (along with India and Korea) has since surpassed its pre-recession peak.



China led the world's upturn beginning in December 2008, followed by Korea, Taiwan and Japan.

(Source: DuPont)

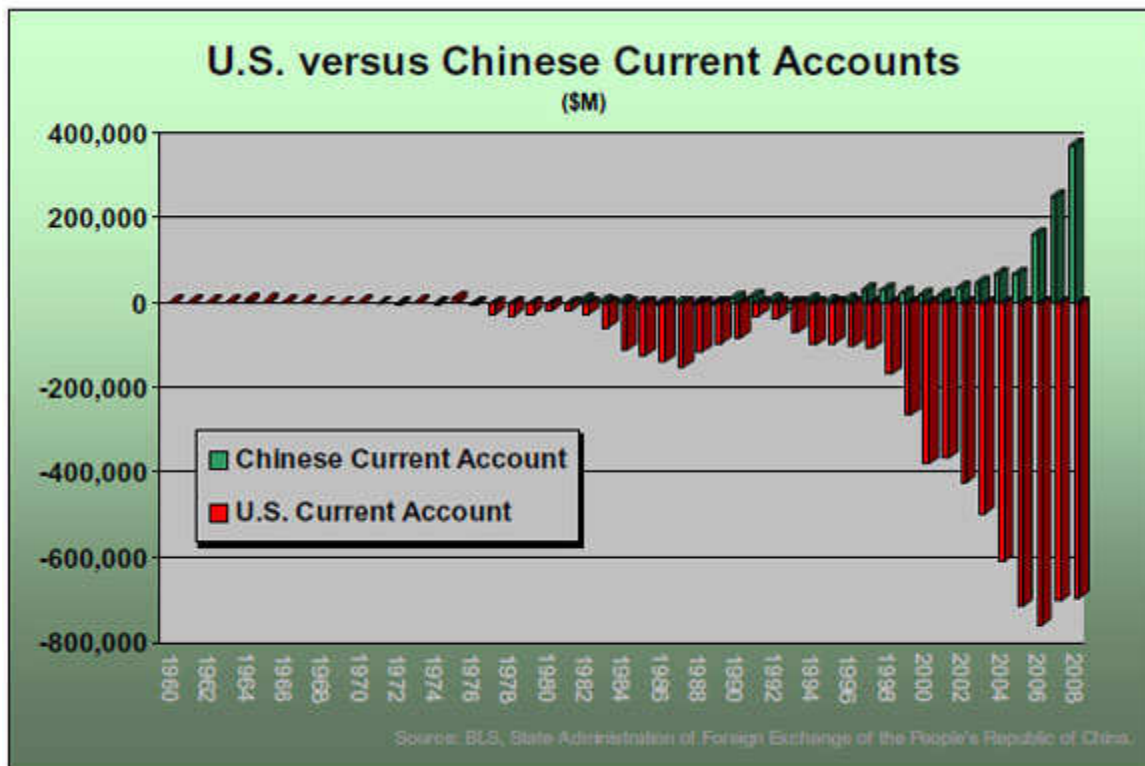
China was fast with its stimulus program, noted Bill McClean, president of IC Insights, and, even though the country has been climbing nicely out of recession, the government still plans to spend the full \$600B of stimulus money.

McClean noted in a separate interview that China was a major factor helping the world semiconductor industry out of its downturn this time around. "Something we didn't have in 2001 was China," he said. China's cell phone and automotive sales are surpassing the United States for first time, he said, and China has become the second largest consumer of PCs.

"China and India are huge drivers for the world economy," agreed Jim Feldhan, president of Semico Research, also noting that 2009 marked the first time China's automotive sales exceeded those in the United States. Although Semico predicts that

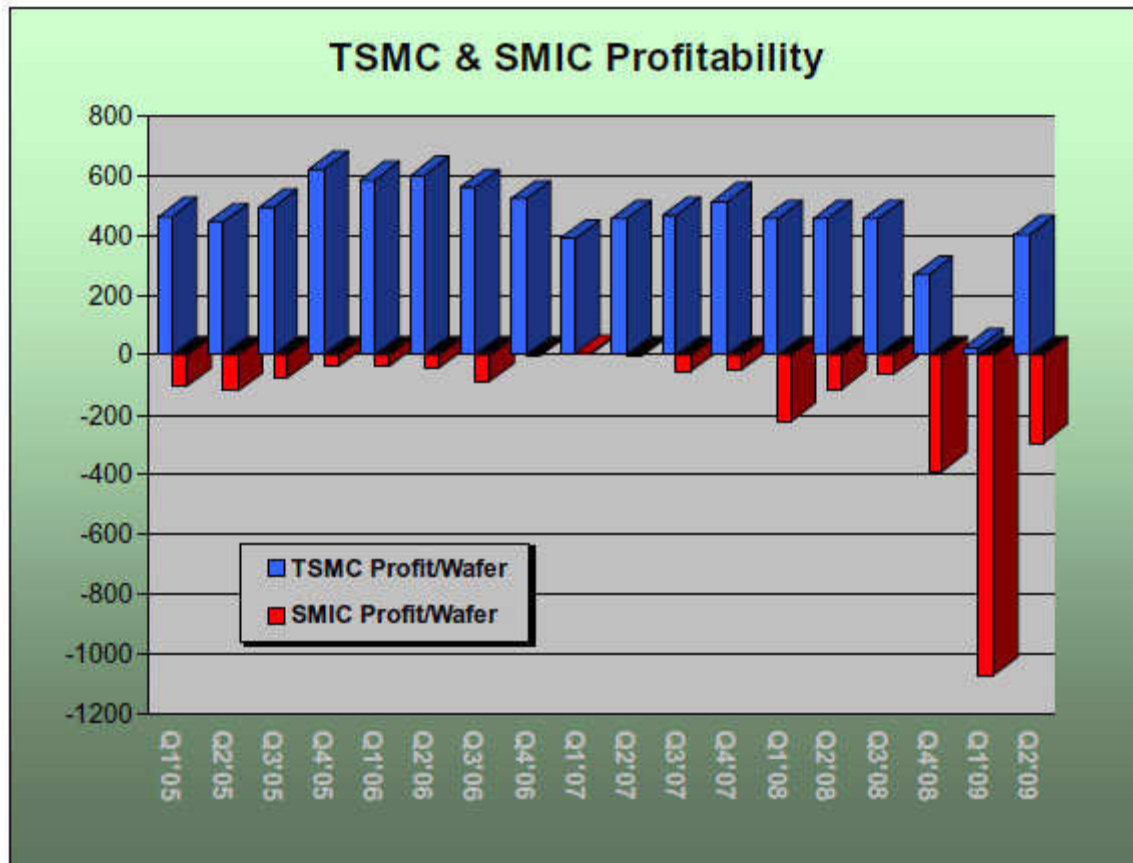
the world GDP will be up 5% in 2010, China's GDP is expected to rise by 10.2% this year, after a rise of 8.3% in 2009, Feldhan said.

According to Dan Hutcheson, chairman and CEO of VLSI Research, China has surpassed the EU and is well on its way to surpassing the United States in purchasing power. "China's surplus is driving enormous amounts of wealth," he said. "That's driving their economy in a big way."



China's surplus is driving enormous amounts of wealth in the country. (Source: VLSI Research)

However, the situation isn't perfect for China, which has had trouble monetizing its success in the tech sectors, Hutcheson said. He showed a chart (below) noting the stark difference in profitability at leading semiconductor foundry TSMC in Taiwan vs. SMIC, China's leading foundry. And the comparison is similar in the solar space between two of the world's leading players, First Solar in the United States and Suntech in China.



Although China has become a dominant world player, it has had trouble monetizing its growth.
(Source: VLSI Research)

China faces other key dilemmas, Hutcheson said: The country holds 22% of the world's population, yet only 8% of its arable land, and only 7% of its water. Therefore, China must continue to buy from the rest of the world.

China's solar play

China not only relies heavily on the rest of the world for its buying needs, but also its selling, particularly in the photovoltaic space. But the government has been introducing incentive plans to help grow the domestic solar market, and has been making a strong showing in the solar market, according to Charlie Gay, president of Applied Solar at Applied Materials. Chinese PV manufacturers are expanding their influence both domestically and abroad, he said.

"A lot of the changes are coming from China," Gay said, adding that 10 major utilities were already getting actively engaged in solar there. It's a very different situation than the industry sees in the United States, he noted. In China, "those utilities are able to bring the market along with the manufacturing."

Several PV manufacturers in China have already taken big steps to get to large-scale manufacturing, Gay said. "None are on [analyst Paula Mints'] charts, but many of them are becoming significant players in bringing down the cost of manufacturing."

Gay visited recently with China's BYD Co., in which Warren Buffett has made a huge investment (and profit) because of its green automotive business. But the company also has a very large-scale solar, LED and battery business, Gay said.

Challenges are looming on the horizon in Germany in particular, where the government is lowering solar incentives. "The corollary to that is that we see huge demand building in China," which is creating its own domestic market to fuel growth, Gay said.

Gay also noted that some of the world's leading academic institutions in energy are in China, which has more than 20,000 students whose careers are built on understanding the grid.

Again, however, China is not without its challenges. For solar, a key drawback is that the population lives in the eastern part of the country, but all the solar resources are in the west. So the challenge is trying to match up the sun's energy with the energy need, Gay said.

Flat panel push

The flat panel display (FPD) industry is seeing a similar trend toward China, according to Ken Sato, vice chairman of Tokyo Electron Ltd., a Japanese semiconductor equipment manufacturer also active in the FPD space. The Chinese government has as a key objective to swap out the country's CRTs with LCDs by 2011, and to have even more LCDs in place by 2013. With the Chinese government subsidizing the plan, Sato said, it is having a major effect on the FPD market.

The industry is dominated by manufacturers in Japan, Korea and Taiwan, but they are increasingly looking to China not only as a growing market, but a good place to make panels domestically, with five to six factories expected to be built in China in 2011, Sato said.

During ISS's Blue Chip CEO Panel Tuesday afternoon, panelists expressed concern about a brain drain from the United States, as graduating students find more compelling reasons to return home. Rick Hill, chairman and CEO of Novellus Systems, expressed particular concern that China and India are doing more these days to entice its engineers and scientists back home.

Hill pointed to China as a fertile domestic market, key for a good startup environment. "China not emerging, it's emerged," he said, noting that the sheer size of the country's domestic market is a key benefit. "The government is like a machine committed to put in place the infrastructure and things to support themselves," he added.

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