

# FUTURE HORIZONS

Presents

## The Semiconductor Monthly Update Report

September 2007

**Here Comes The Cavalry ...  
July's Results Were Outstanding**

---

### In This Issue:

Executive Overview .....	1
Market Summary .....	8
Cowan LRA Report (New Feature For 2007) .....	13
Industry Capacity .....	17
World Economic Round Up .....	19
Russia/CIS – Car Industry Revs Up .....	23
Economic Case Study – A Family Tradition .....	25
Market Trends – SC Business Models .....	27
Semiconductor Spotlight – European IP Firms .....	37

*plus ...* Euro Exchange Rates & FH Upcoming Events

**Sign Up Now For IFF2007 International System & SoC Forum  
Oct 10-12, 2007, Prague, Czech Republic**

(Visit Our Website [www.futurehorizons.com](http://www.futurehorizons.com) For Further Details & Registration)

# The Semiconductor Monthly Update Report

## September 2007

A **CEO favourite**, the **Semiconductor Monthly Update Report** provides **analysis and commentary** on the **global semiconductor industry** and its **impact** on Future Horizons' **semiconductor market forecast**, as published in the **Annual Semiconductor / Semiconductor Application Markets** (previously called Key Market Drivers) **Reports**. These three reports provide a comprehensive in-depth analysis of the worldwide semiconductor, electronics equipment and economic environment. Together they provide the latest information on developments in the semiconductor industry, the companies involved, the changes in the markets, and the impact of the global economic and political situation.

*If you like this Report, by all means share it with your colleagues or post it on your company Intranet ... but please respect international copyright laws. Site licence available for only £2,200 (€3,3700 / US\$4,600) p/a. Please email Future Horizons on "subscriptions@futurehorizons.com".*

**Copyright ©2007 by Future Horizons, Republication Prohibited**

All rights reserved. No part of this publication may be reproduced, stored in retrieval systems, or transmitted in any form or by any means (mechanical, electronic, photocopying, duplicating, microfilming, video-tape or otherwise) without the prior written permission of Future Horizons. This information is not furnished in connection with a sale offer to sell securities, or in connection with the solicitation of an offer to buy securities. This firm and/or its officers, stockholders, or members of their families may, from time to time, have a position or may sell or buy such. The information contained in this report has been derived from statistical and other sources deemed to be reliable but its completeness and accuracy cannot be guaranteed. Opinions expressed are based on our studies and interpretations of available information. They reflect our judgement at that time and are subject to future change. Whilst the report has been prepared in good faith, Future Horizons bears no responsibility for any consequences whatsoever aroused to the buyer through the reading of, or acting upon, any data or information, etc. contained in the report.

# Future Horizons

**www.futurehorizons.com** ♦ **mail@futurehorizons.com**

In Russia Tel/Fax: East-West Electronics +7 (495) 151 1639; e-mail: sorlov@futurehorizons.com  
(East-West Electronics is a Wholly-Owned Subsidiary of Future Horizons)

## The Semiconductor Monthly Update Report

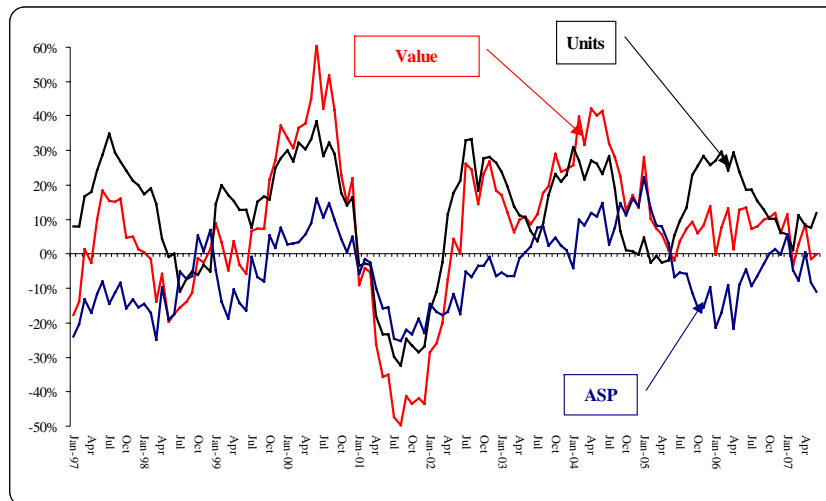
### September 2007

#### Executive Overview

Figure E1 shows the 12/12 worldwide monthly growth rates for IC sales in dollars, units and ASP for January 1997 to July 2007 inclusive. They need to be looked at in conjunction with the other 12/12 and rolling 12-month charts provided in the **Market Summary** section of this report.

Right on cue, July's results were a welcome relief following the disastrous first-half year performance, with month-on-month IC revenue growth up 12.0 in value, 11.0 percent in units. Year-on-year, July's sales were up 14.4 percent on the same period last year. Even the monthly ASP decline was only 0.8 percent, remarkably low for the first month of a new quarter (the making the quarterly number phenomenon). We always said the market would rebound strongly in Q3, although the first half-year sales tested our nerves to the limit. The big question now is; "how strong will the third quarter recovery be?" With the quarter off to a flying start, we believe a double-digit quarter-on-quarter growth is quite probable, followed by a seasonal slowdown in Q4-07, exactly in line with our recent forecast adjustment. 2007 growth in the range of 5-6 percent is still a probability.

**Figure E1 - 12/12 Worldwide IC Monthly Growth Rates**



Total IC	Units	ASP	Value
<b>Jul 2007 vs Jul 2006</b>	<b>10.2%</b>	<b>3.8%</b>	<b>14.4%</b>
<b>Jul 2007 vs Jun 2007</b>	<b>12.0%</b>	<b>-0.8%</b>	<b>11.0%</b>

Source: WSTS/Future Horizons (Growth rates adjusted for 5-week months)

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

Except ... just as July's chip industry seasonal rebound hit the headlines, the news of a potential implosion in the global financial markets also broke.

**The Most Basic Of Instincts?**

The dark side of capitalism – greed versus fear – it seems once again has reared its ugly head. In an era of easy money, the professionals forgot that the party could not last forever. Just like in the 2000 dot-com bubble boom, the conventional wisdom “this time it's different ... the old rules no longer apply” imploded in August with a resounding economic crash.

Clearly too much cheap credit had been swilling around the markets, fuelled by the era of cheap interest rates in the wake of the 2001 crash, underpinned by an elongated period of stable global markets. This perception of ‘easy money’ helped fostered a sense of complacency, with the dangers of unrestrained borrowing and the lessons of the wild highs and lows of the seventies and eighties either dismissed or ignored.

At the core of the crisis were the so-called Collateralised Debt Obligations (CDO) – a method of parcelling up loans and selling them on. A variation on CDOs called Structured Investment Vehicles (SIV) was even more creative, using cheap short-term borrowing as the source of its collateralised debt. Whilst the CDO concept has obvious theoretical merit, it was supposed to spread the burden of risk (and return) across the financial community, with investors invited to buy a stake in a CDO vehicle, with different stakes offering different levels of risk and return.

In reality the outcome was exactly the opposite, as the financial rocker scientists devised ever more elaborate and exotic debt packages – from loans that were super secure to those with white-knuckle risk levels – that overnight became virtually worthless. As feared by critics, such as investment guru Warren Buffett, no one really knew who owned the risk, or even what the real risk actually was. The SIV concept was even worse; little short of reckless uncontrolled gambling.

Had investors been asked if they would like to buy portfolios of loans made to low-income Americans with bad credit histories and houses in neighbourhoods somewhat less desirable than Beverly Hills, there answer in any language would have been a resounding NO! But that was not how the loans were dressed up and sold. Instead investors were offered clever-sounding products that promised big returns and appealed irresistibly to investor's old-fashioned sense of greed.

**Structural Risks**

Put simply, the job of the traders and brokers is to make millions for big companies. They compete ferociously to maximise profits for themselves and

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

their masters, but increasingly are tempted to do so in new and untried ways, or by sidelining the caution and restraint of previous generations.

Working alongside them are the grey men of the back office; they do the paperwork behind the trader's deals and run the regulatory systems. It is their job to monitor the markets and ensure checks and balances are properly applied. In reality, the regulators, auditors and compliance officials are invariably playing catch up; their understanding and knowledge of the markets and instruments being traded simply cannot keep pace with the hugely competitive front office.

Apart from this structural problem, in the wake of the crisis it also seems that many of the back office and regulatory bankers were unfortunately not up to the task. The front end of the business is far more profitable, attracting the brightest and best by the seduction and lure of big bonuses, leaving the less ambitious – or less bright perhaps – to take the safe desks in the back end processes.

One of the key other problems associated with the current financial crisis was the use of predictive modelling by the financial community; complex computer programmes designed to anticipate what markets will do. In other words, the models attempted to use historical trends to make predictions. Where once someone with years of expertise would gauge the best opportunities for high-profit trades, a computer was now doing this. The algorithms, they claimed, just could not fail.

Yet fail they did, and with the absolute efficiency only computers can achieve. It subsequently transpired that some of the complex mathematical formulae used by the quantitative equity funds just did not add up.

Unfortunately computers cannot easily take into account one-off catastrophes, such as the collapse in the US housing market and the pressure that interest rates had put on international currencies. Programmed to respond in essentially similar ways, when things started to go wrong, everyone's computer started to adopt a 'sell now' strategy, leaving no one on the buying side and a melt down in prices.

In the wake of the melt down, mistrust and panic set in. No matter how attractively they had been previously dressed up, the financial community could no longer disguise the underlying risks associated with their past over-aggressive lending, flawed business models and hard-line market strategies. The sheer complexity of some of the financial instruments devised by the world's financial rocket scientists also meant that, not only were the instruments beyond the comprehension of most of the people involved, no one actually now knew who owed what and to whom and thus what the real trading value of their once-prized, highly liquid assets were.

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

Clearly the current liquidity problem is basically down to greed, incompetence and a naïve reliance on the power of computers to predict the future. Gluttonous lenders had been too ready to extend loans to unfortunates who could not afford them and bankers, greedy for quick bucks, asked too few questions about the debt packages they traded.

Whilst the financial crisis appeared to have come out of nowhere, it had in fact been brewing for a considerably long time, triggered by a period of cheap money that opened the door for slackness and over-risky lending. After a while these apparent money-spinners eventually turned sour, instigating a general revulsion of risk and an essential closing of the money markets as banks – concerned about the creditworthiness of the other financial institutions – rather than lending held onto and hoarded their cash instead.

Clearly the US is the worst victim in the so-called sub-prime housing market but the underlying concern is whether Asia and Europe will be able to pick up the world's growth baton as the American economy stumbles. Often overlooked, however, is Japan, still the world's second largest economy and a major global creditor with some US\$3,000 billion in net foreign assets. Output here had already contracted – at an annual rate of 1.2 percent in the second quarter of 2007 – before the debt crisis had hit the financial community and there is a real danger that its stalled recovery will tumble into an outright recession. In addition, access to cheap money which has vanished in the wake of the credit crisis, has left private equity firms reeling from a lack of equity that has already scuppered several high-profile deals.

The precise impact of the financial crisis on the economy may well still be hard to estimate, but it seems highly likely that growth will be reduced. The big fear is that what started as a US-property slump – where dodgy loans were made to unsound borrowers – will spread beyond the debt markets and onto the factory floor. If that does happen, you can kiss the 2008 chip market goodbye.

With the Q3 reporting results now on the horizon, as the banking giants unveil the inevitable multi-billion dollar scars suffered by traders who went for glory, buying 'attractive' fancy debt packages rather than questioning the underlying assets, at least some light will be thrown on the scale of the problem. Horrendous as it may well turn out to be, at least we might be able to see how many zeros that need to be counted.

**Lessons To Be Learnt?**

Caveat Emptor ... the old adage 'If it seems too good to be true it probably is too good to be true' still holds, with greed for quick profit is at the centre of these

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

problems, yet management and governments seem unable to resist the lure and temptation of the 'easy option' strategy. The shift from manufacturing from services is another example in point, although this reality has yet to implode.

Dependence on the financial versus manufacturing industry has clearly left some country's economies vulnerable in the current global credit crisis. In the chip industry, we have often cautioned on the dangers of shifting strategy from manufacturing to design. Likewise, we have always been sceptical of the temptation to simply up stick and move manufacturing operations offshore to 'low cost' global centres such as India and China, without at the same time addressing the underlying problems.

As has been already shown in Eastern Europe – a 'low cost' manufacturing area until the first swathe of countries joined the EU in 2004 – 'low cost' over time has an uncanny knack of turning 'high' and we have always been gravely critical of decisions that see manufacturing geographically separated from design. To our mind the writing is clearly on the wall by the recent decisions in another manufacturing-based industry.

Manchester-based SSI International, the manufacturer of Durex condoms, is to shift some of its operations from the UK to Asia in a move designed to place product development and manufacturing in closer proximity. According to a spokesperson "If you put the technical people alongside manufacturing, you can get a much quicker turnaround of new products."

It would seem the first global multi-nationals are now turning to Asia as the new frontier for R&D capability; in short, off shoring – once a trend restricted to a narrow band of communications-focused jobs such as call centres – is steadily and inexorably moving up the economic value chain.

Time to remind ourselves of the seven deadly sins and perhaps, more importantly, their contrary virtues, shown below in brackets?

Lust (chastity)

Gluttony (abstinence)

Greed (temperance)

Sloth (diligence)

Wrath (patience)

Envy (kindness)

Pride (humility)

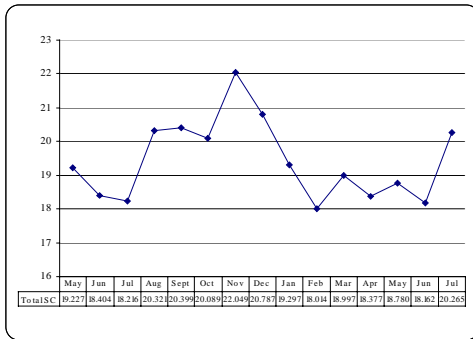


**The Semiconductor Monthly Update Report**

**September 2007**

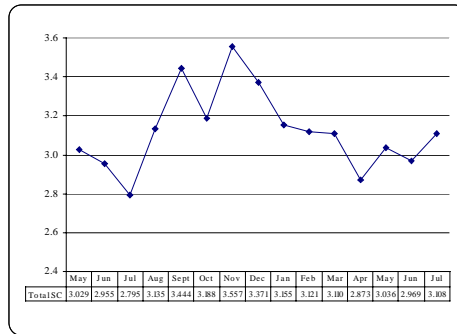
**Figure M3 - 12 Month Rolling Worldwide & Europe Sales By Product**  
(Billions Of US\$)

**M3a - Total WW Semiconductor**



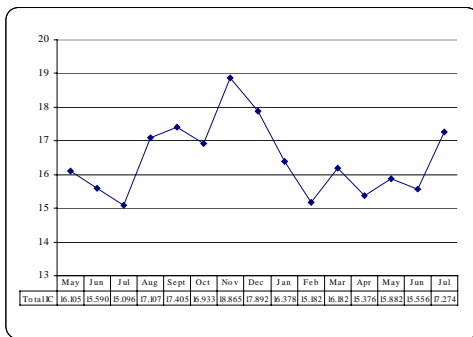
**Jul 2007 vs Jun 2006**      **11.3%**  
**Jul 2007 vs Jun 2007**      **11.6%**

**M3b - Total Europe Semiconductor**



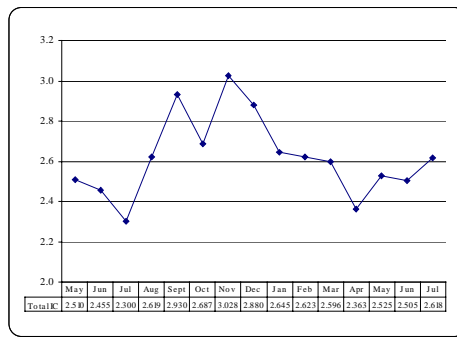
**Jul 2007 vs Jul 2006**      **11.2%**  
**Jul 2007 vs Jun 2007**      **4.7%**

**M3c - Total WW IC**



**Jul 2007 vs Jul 2006**      **14.4%**  
**Jul 2007 vs Jun 2007**      **11.0%**

**M3d - Total Europe IC**



**Jul 2007 vs Jul 2006**      **13.8%**  
**Jul 2007 vs Jun 2007**      **4.5%**

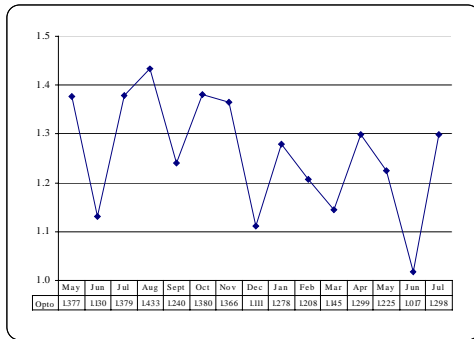
Source: WSTS/Future Horizons (Growth rates adjusted for 5-week months)

The Semiconductor Monthly Update Report

September 2007

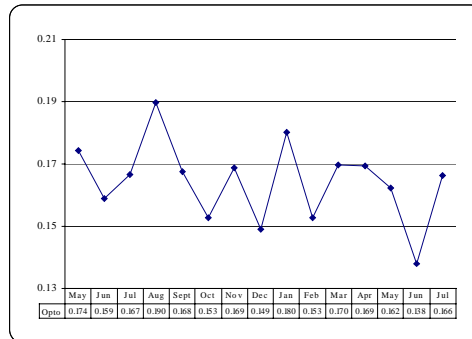
Figure M3 - 12 Month Rolling Worldwide & Europe Sales By Product (Cont)  
(Billions Of US\$)

M3e – Total WW Optoelectronics



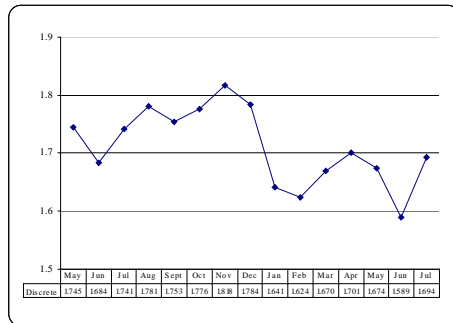
Jul 2007 vs Jul 2006 **-5.9%**  
Jul 2007 vs Jun 2007 **27.7%**

M3f – Total Europe Optoelectronics



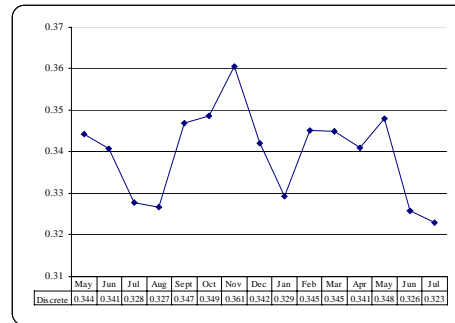
Jul 2007 vs Jul 2006 **-0.2%**  
Jul 2007 vs Jun 2007 **20.6%**

M3g – Total WW Discretes



Jul 2007 vs Jul 2006 **-2.7%**  
Jul 2007 vs Jun 2007 **6.5%**

M3h – Total Europe Discretes



Jul 2007 vs Jul 2006 **-1.5%**  
Jul 2007 vs Jun 2007 **-0.9%**

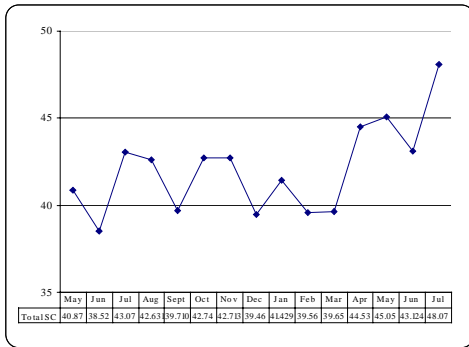
Source: WSTS/Future Horizons (Growth rates adjusted for 5-week months)

**The Semiconductor Monthly Update Report**

**September 2007**

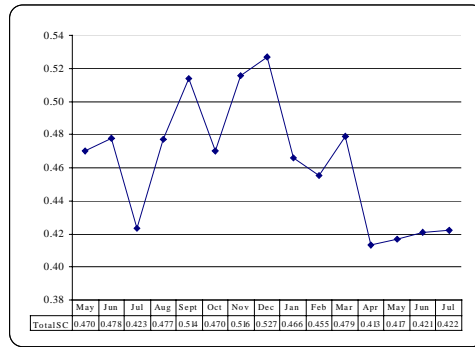
**Figure M4 - 12 Month Rolling Worldwide Unit Sales & ASPs By Product**  
(Units In Billions & ASP In US\$ Dollars)

**M4a – Total Semiconductor Units**



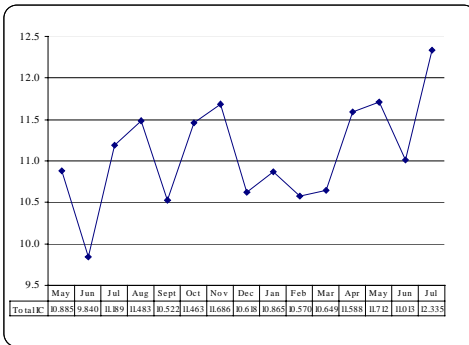
**Jul 2007 vs Jul 2006 11.6%**  
**Jul 2007 vs Jun 2007 11.5%**

**M4b – Total Semiconductor ASP**



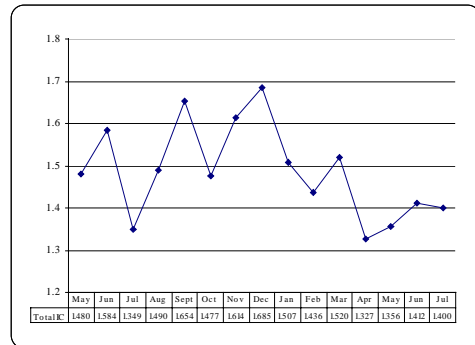
**Jul 2007 vs Jul 2006 -0.2%**  
**Jul 2007 vs Jun 2007 0.2%**

**M4c – Total IC Units**



**Jul 2007 vs Jul 2006 10.2%**  
**Jul 2007 vs Jun 2007 12.0%**

**M4d – Total IC ASP**



**Jul 2007 vs Jul 2006 3.8%**  
**Jul 2007 vs Jun 2007 -0.8%**

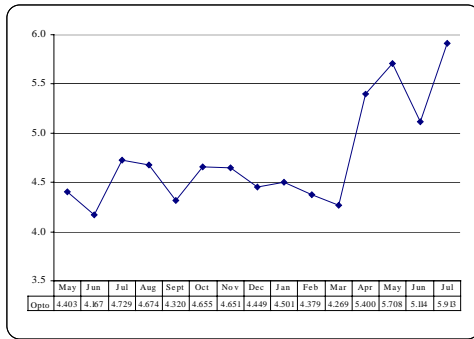
Source: WSTS/Future Horizons (Growth rates adjusted for 5-week months)

The Semiconductor Monthly Update Report

September 2007

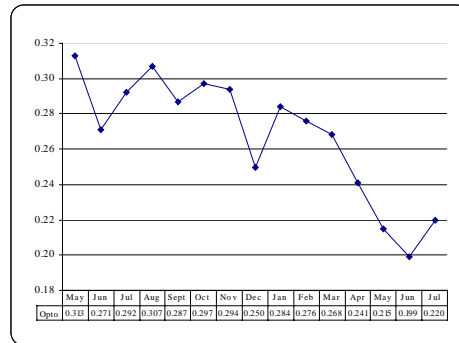
Figure M4 - 12 Month Rolling Worldwide Unit Sales & ASPs By Product (Cont)  
(Units In Billions & ASP In US\$ Dollars)

M4e - Total Optoelectronics Units



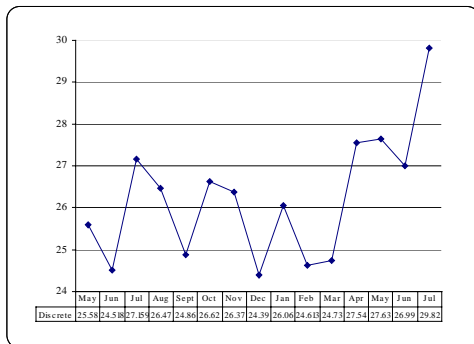
Jul 2007 vs Jul 2006 **25.0%**  
Jul 2007 vs Jun 2007 **15.6%**

M4f - Total Optoelectronics ASP



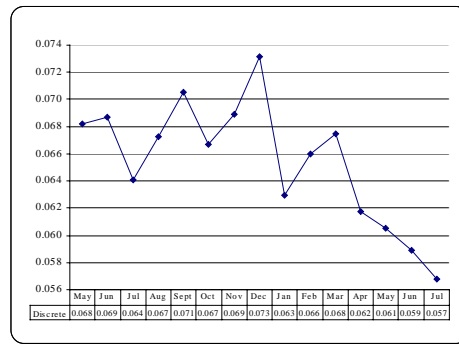
Jul 2007 vs Jul 2006 **-24.7%**  
Jul 2007 vs Jun 2007 **10.6%**

M4g - Total Discretes Units



Jul 2007 vs Jul 2006 **9.8%**  
Jul 2007 vs Jun 2007 **10.5%**

M4h - Total Discretes ASP



Jul 2007 vs Jul 2006 **-11.4%**  
Jul 2007 vs Jun 2007 **-3.6%**

Source: WSTS/Future Horizons (Growth rates adjusted for 5-week months)

## The Semiconductor Monthly Update Report

### September 2007

#### Cowan LRA Report (New Feature For 2007)

Created by Mike Cowan, the Cowan Linear Regression Analysis (LRA) model naturally compliments Future Horizons' more interpretive methodology, and the two forecast approaches provide readers with a unique and balanced perspective. The latest run, based on the July 2007 WSTS global semiconductor sales of \$22.265 billion, has produced global sales forecast estimates for 3Q07 through 3Q08 plus a forecast for July 2007, Table L1. Newly calculated revenue forecasts for 3Q-4Q07 (and 2007), plus 1Q1-3Q08 are shown in Table L2. Also included in this table is an actual and 3-month moving average (3MMA).

**Table L1 – Global Semiconductor Sales Forecast Estimates**

<b>Time Period</b>	<b>Prev Month's Estimate (\$b)</b>	<b>This Month's Estimate (\$b)</b>	<b>% Change</b>
Jul07 (Act)	18.737	20.265	8.2%
Jul07 3MMA Act.	20.073	20.582	2.5%
Aug07 Est.	NA	20.806	NA
Aug07 3MMA Est.	NA	21.258	NA
3Q07 Est.	65.016	66.975	3.0%
4Q07 Est.	67.111	67.716	0.9%
<b>2H07 Est.</b>	<b>132.127</b>	<b>134.691</b>	<b>1.9%</b>
<b>2007 Est.</b>	<b>253.042</b>	<b>255.606</b>	<b>1.0%</b>
1Q08 Est.	64.435	65.042	0.9%
2Q08 Est.	64.387	65.011	1.0%
<b>1H08 Est.</b>	<b>128.822</b>	<b>130.053</b>	<b>1.0%</b>
3Q08 Est.	72.154	72.654	0.7%
Jul07 (Act)	18.737	20.265	8.2%
Jul07 3MMA Act.	20.073	20.582	2.5%

**Table L2 - Sequential & Annual Revenue Growth Rates**

<b>Qtr - To - Qtr Period</b>	<b>Jul Est SRG (%)</b>	<b>Jun Est SRG (%)</b>	<b>Yr - To - Yr Period</b>	<b>Jul Est YoY (%)</b>	<b>Jun Est YoY (%)</b>
2Q07 Est => 3Q07 Est	11.9%	8.6%	Aug06 Act => Aug07 Est.	2.4%	NA
3Q07 Est => 4Q07 Est	1.1%	3.2%	Aug06 3MMA => Aug07 3MMA Est.	3.6%	NA
4Q07 Est => 1Q08 Est	-3.9%	-4.0%	3Q06 Act => 3Q07 Est	4.6%	1.5%
1Q08 Est => 2Q08 Est	0.0%	-0.1%	4Q06 Act => 4Q07 Est	3.8%	2.9%
3Q08 Est => 2Q08 Est	11.8%	12.1%	<b>2006 Act =&gt; 2007 Est</b>	<b>3.2%</b>	<b>2.2%</b>
			YTD 2006=>YTD 2007 (Through Jun)	3.3%	2.1%
			1Q07 Est => 1Q08 Est	6.5%	5.5%
			2Q07 Est => 2Q08 Est	8.6%	7.6%
			3Q07 Est => 3Q08 Est	8.5%	11.0%

Source: WSTS/Cowan LRA

The Semiconductor Monthly Update Report

September 2007

Figure L1 – Market Momentum Indicator

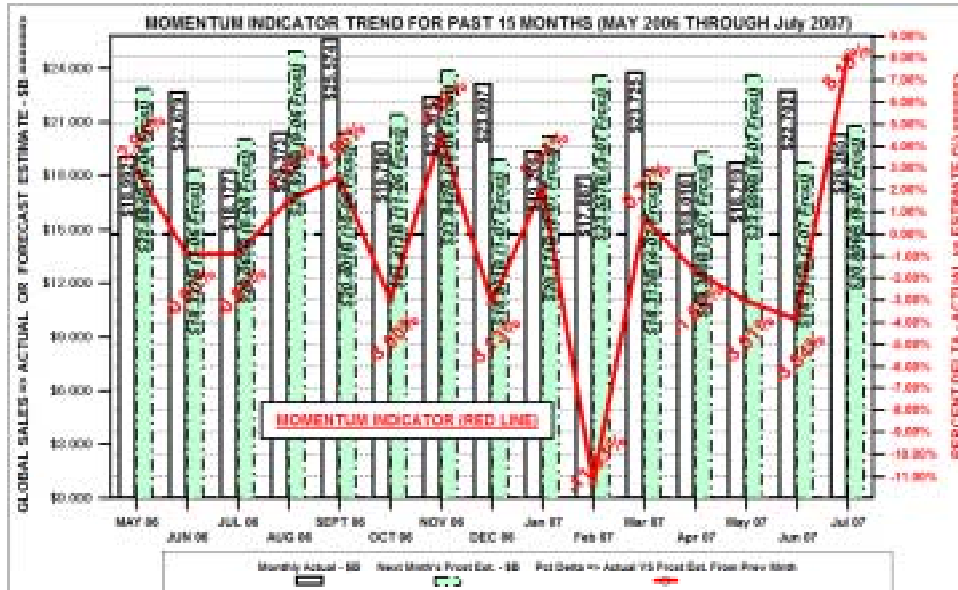
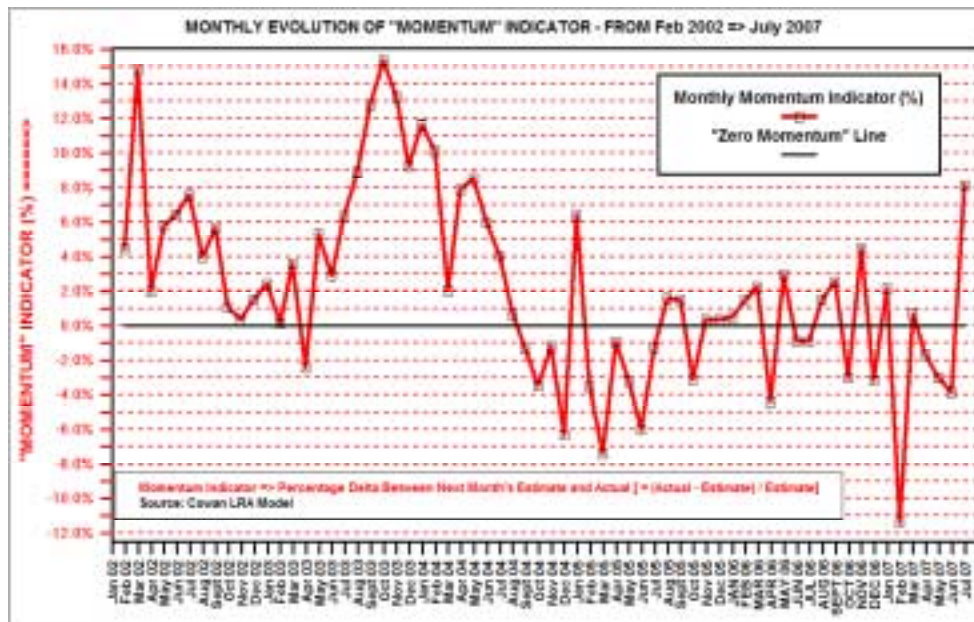


Figure L2 - Monthly Momentum Indicator, 2002-2007 YTD



Source: WSTS/Cowan LRA

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

As can be seen from Figure L1, above, the momentum indicator increased dramatically from the previous month's momentum of minus 3.84 percent to plus 8.15 percent thereby reversing the previous negative trend. This significant jump portends a projected rise in the sales growth rate over the rest of 2007 and is related to the relatively strong sales result for July. The actual July sales number (preliminary with possible revisions next month) came in at \$20.582 billion, 9.8 percent higher than last month's forecast estimate of \$18.737 billion. As a result, all six of the updated sales forecast estimates, namely 3Q07, 4Q07, 2007, 1Q08 and 2Q08 improved by varying degrees compared to last month's calculated forecast estimates as summarized in the Percent Change column, Table L1.

Relative to next month's global sales estimate, August's 2007's global semiconductor sales are forecast to be \$20.806 billion. This yields a 3MMA (three Month Moving Average) sales forecast estimate for August of \$21.258 billion which is normally reported by the SIA in its monthly press release.

Table L2 shows the associated quarterly and year-on-year growth rate forecasts for June as compared with last month's estimates. The updated forecast of year-over-year sales growth for 2007 compared to 2006's final global semiconductor sales of \$247.716 billion is now predicted to be plus 3.2 percent, as compared with last month's 2.2 percent estimate and the previous month's 3.0 percent figure, with monthly re-iterations of the model still expected over the course of the year.

Figure L1 shows the rolling 15-month momentum indicator trend, whereas Figure L2 shows the year-to-date monthly indicator trend since February 2002. The momentum indicator is defined as the percent difference between the actual sales number for a given month and the forecasted sales estimate calculated the previous month.

This indicator can be either positive or negative and is a measure of the deviation of the actual monthly sales number from the model's prediction based upon 23 years of past historical results. When the momentum indicator is positive, it indicates that the growth vector is increasing.

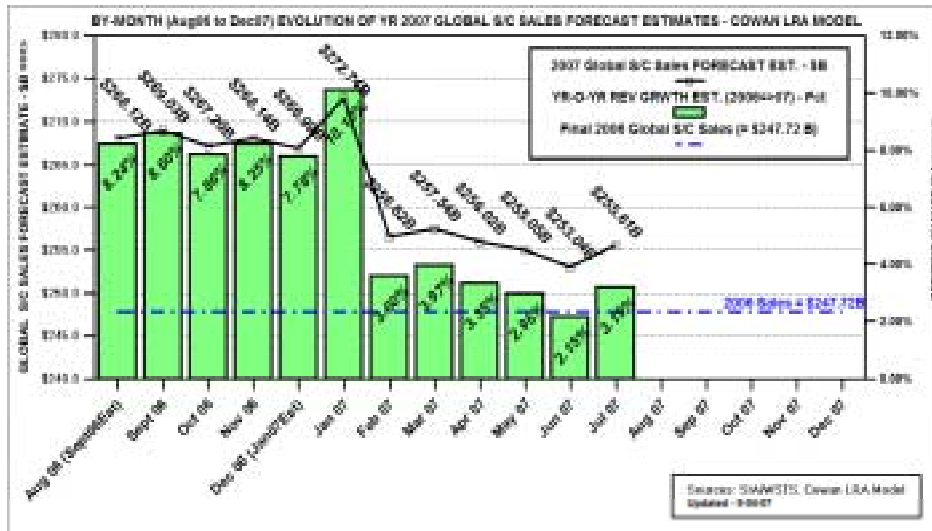
Finally, Figure L3 shows the evolution of the past sales forecast estimates for 2007 over the previous eight months starting from the model's first prediction for 2007, namely with the August 2006 sales number which was released back in the beginning of October 2006.

Typically, July through September's forecast results are reasonably good proxies for the entire year's sales number, with the predictions improving with each subsequent month's forecast estimate.

## The Semiconductor Monthly Update Report

# September 2007

Figure L3 - 2007 Forecast Evolution



Source: WSTS/Cowan LRA

Whilst the monthly global sales number published by the WSTS is a "lagging indicator", since it is published a full month after the fact, each month the Cowan LRA Model "turns" this lagging sales number into a "leading indicator" since its forecast horizon covers the next five quarters. It is this unique feature that makes the model dynamic, since it is updated each month with the latest sales data, allowing forecast revisions over the course of the year, Table L3.

*The Cowan LRA Model for forecasting global semiconductor sales is a statistically based model exploiting linear regression analysis of the past 23 years of historical monthly revenue results as published by the SIA. It is a mathematically-pure view of forecasted worldwide semiconductor sales looking out over the next five quarters. Linear regression techniques are utilized on the "appropriately transformed" monthly sales numbers thereby rendering the sales data highly linear and, therefore, very amenable to linear regression analysis. The numerical transformation (of the 23 years of monthly sales data -- from 1984 to 2006) that is invoked is not a complicated numerical manipulation but is quite straight forward and "makes sense physically" thereby yielding extremely high correlation coefficients approaching 0.98 and higher. In exercising the model each month a total of 6 distinct sets of linear regression parameters ( $y = mx + b$ ) are employed in order to determine the sales forecast predictions for each of the next five quarters as well as a sales forecast estimate for the following month. Mike Cowan, the LRA inventor, is a 40-year semiconductor industry veteran, most recently retired (Jan 2002) from IBM Microelectronics where he was engaged in both technical and management assignments including strategy development and competitor/competitive analysis. For more details, please contact Mike at: [mikedco@attglobal.net](mailto:mikedco@attglobal.net).*

## The Semiconductor Monthly Update Report

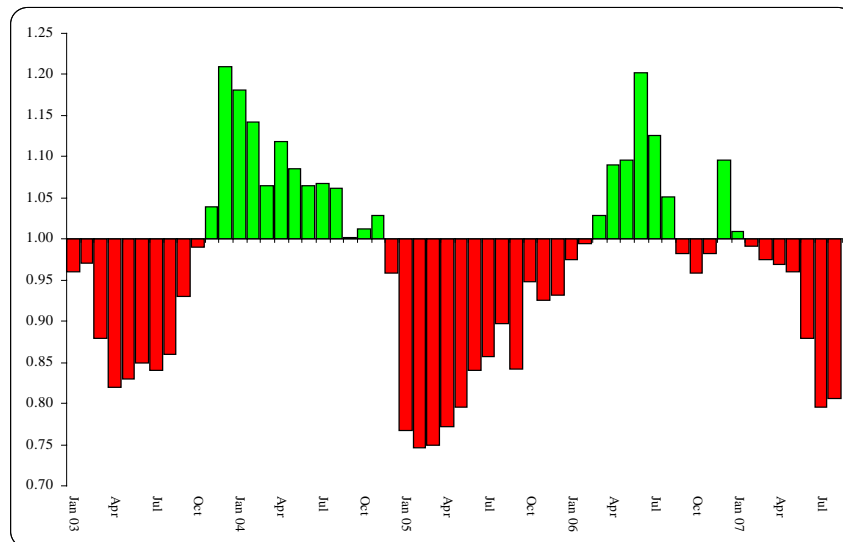
### September 2007

#### Industry Capacity

With the inventory burn now over and capacity utilisation rates on the rise, the underlying question is: could the industry finally be entering a period of strong growth, just as it did in 2003-04? The answer to that question depends on two factors; new capacity additions and on-going unit demand. The former has already been determined by the past four quarters of investment trends and the latter now mostly depends the state of the world economy and how fast inventory again rebuilds in the supply chain.

Figure C1 shows the monthly book to bill trends for the all important wafer fab equipment sales.

**Figure C12 – Wafer Fab Investment Trends, 2003-To Date**  
(Book-To-Bill Ratio)



Source: SEMI/Future Horizons

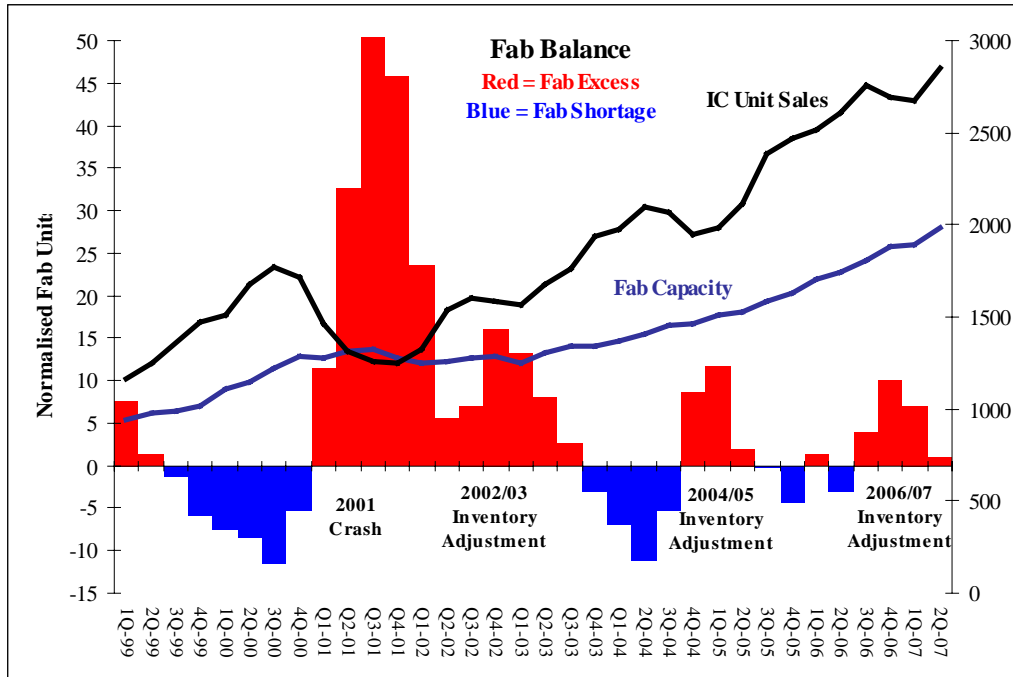
With the level of new orders sizeably lower than current sales since January 2007, the rate of new net capacity additions must inevitably slow down, albeit delayed by one year. Today's cap ex orders thus equals new IC sales four quarters later. The net result is that capacity increases will be much lower in 2008. Provided IC unit demand holds up, the only net outcome is a further increase in today's 90 percent utilisation rates.

**The Semiconductor Monthly Update Report**

**September 2007**

The danger signs will come when investment starts to accelerate, which is unlikely to happen before Q2-08 at the earliest. The current new capacity investment trends are decidedly good, Figure 9.

**Figure 9 – Supply-Demand Balance**  
(Equivalent 200mm Fabs)



Source: SEMI/WSTS/Future Horizons

That leaves unit demand as the real key to the question, which in turn now depends on the 2008 economic outlook and the inevitable new inventory build.

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

**World Economic Round Up****World Economy**

In a month of financial market turmoil, caused initially by the subprime mortgage problems in the US, investors have become risk averse. Investors globally reduced or dropped completely their riskier investments such as the yen carry trade, in favour of safer havens like government bonds. It is normal for central banks to control economic growth and prices by increasing or decreasing the supply of funds to keep market rates steady. However, August saw several central banks injecting huge amounts into the financial market in an effort to calm the upheaval. Some analysts are predicting that continued unrest will lead to global productivity problems and slowing economies.

The discussion about oil continues with the Organisation of the Petroleum Exporting Countries (OPEC) unlikely to raise its production quota. The recent turbulence in financial markets has increased demand for more crude oil to ease the upward price rise, which is above US\$70 a barrel and considered too high.

The middle of August saw the dollar recovering against the Euro and GB pound. Additionally, the unravelling of the carry trade in yen increased its value during the month.

**North America**

The cutback in new home construction has directly affected US economic growth by about 0.75 percent over the past 18 months. Investors have become very cautious about investing in the subprime market and many major lenders have announced the cancellation of some subprime lending programmes. Other lenders that use asset-backed commercial paper have been forced to draw on back-up liquidity or extend the maturity of their paper. As a result, rules for lending are tightening considerably.

The Federal Bank (Fed) injected US\$62 billion into the US financial markets over two days. Following that, on 17<sup>th</sup> August, the Fed announced a rate cut from 6.25 percent to 5.75 percent for lending to banks and made adjustments in the Bank's usual discount window practices. There is an historic stigma attached to borrowing from the discount window but several of the biggest US lenders each borrowed US\$500 million as a symbolic gesture to encourage others.

The Federal Bank has stated that it will take additional action to promote the orderly functioning of markets but that it is not their responsibility to protect lenders and investors from the consequences of their financial decisions. Whilst

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

key interest rates remained unchanged, one indication that investors have become extremely risk averse was the scramble to buy US Treasury bills.

**Europe**

At the height of the recent financial markets debacle, the European Central Bank (ECB) injected US\$213.62 billion in just two days. The ECB continued to support the financial markets throughout the month but banks remained cautious about lending to each other. The beginning of August saw the ECB hinting strongly of a rise in rates in September but following the market turbulence they kept their key lending rate at 4 percent.

In Germany, the two-headed banking supervision system came under fire as Bafin, the German financial services regulator, did not act soon enough to prevent crises at two banks that then had to be bailed out.

Other reports show that the eurozone's economic recovery is slowing with GDP for the three months to June falling by 0.6 percent to 0.3 percent on the previous quarter. House price growth, also falling, is threatening to act as a brake on the region's economies. Higher ECB interest rates and weaker US demand for European goods and services will hit the Eurozone. Construction activity, which was strong at the beginning of the year, is also weakening. GDP growth in France, Germany and Italy fell by 0.2 percent in the second quarter from the first quarter of 2007.

**UK**

Unlike its central bank global partners, the Bank of England (BoE) did not offer discounted borrowing rates or inject funds into the financial markets even though overnight lending rates in market rates rose a full percentage above the bank's target. The BoE governor has warned repeatedly that investors were being too risky in their investments and stated that 'interest rates are not a tool to protect unwise investors from the consequences of their unwise actions.' Expectations of a further rate rise did not occur and the BoE left its rates at 5.75 percent at their September meeting.

Inflation unexpectedly dropped from 2.4 percent in June to 1.9 percent in July, falling below the bank's 2 percent target for the first time since March 2006. A combination of sharp declines in monthly figures for food and furniture prices contributed to the inflation drop.

House prices are rising at a slower rate and mortgage lending is falling slowly indicating that the recent rate rises are beginning to take effect. The credit crunch,

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

distress in the credit markets, higher interest rates and the strength of the pound are likely to hamper development of UK companies. Concerns are growing that UK companies are not likely to invest as much in development and that they will be unwilling to take on more staff if the current financial climate continues.

**Japan**

The upper house election defeat of the ruling Liberal Democratic Party by the Democratic Party of Japan is likely to have an affect on the Bank of Japan (BoJ) in the next twelve months. The DPJ is likely to reject moves by the LDP relating to bank issues. At the end of August, the BoJ kept the interest rate at its present level. Early in August the BoJ injected Y1600 billion (almost US\$13.9 billion) in the money market to ease pressure on the overnight money market interest rates, draining Y600 billion (US\$5.08 billion) just two days later.

The current quarter saw consumer spending drop by a further 0.4 percent from 0.8 percent. As carry trades start to unravel, the yen has risen in value, which will erode profits for Japanese exporters. Already in August, Japan's largest exporters saw a plunge in the value of their shares, which have only partly recovered.

It is reported however that Japanese companies are still fundamentally solid as in the case of Toyota, who is about to overtake General Motors as the world's largest auto manufacturer in terms of sales volume. Despite the economy growing at a slower pace than expected in the second quarter, economists feel that the Japanese economy is still on the road to recovery.

**China**

The end of August saw yet another rate rise by the Chinese central bank to 7.02 percent in an effort to control inflation. The consumer price index in July was up by 5.6 percent from the previous year, the highest rate of increase since 1997. Economic inequality is higher in China than in any other Asian country, with food prices rising all the time.

The strict controls on the flow of capital in and out of the country have insulated China from global financial markets and the current difficulties. However, with large foreign investment and a growing trade surplus of around US\$112 billion there is too much liquidity in the Chinese financial system. To offset the possibility of an asset bubble, the government is allowing individuals to invest into Hong Kong securities. This remit will eventually include investment in other markets in the future.

China's drive to become a global force in science and technology faces several obstacles states the OECD in a recent report. Although the investment and work

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

done to date was impressive, it focussed on the high technology sector rather than on basic research. More investment is needed in sectors such as services, energy and environmental technology. Also, less government involvement and more talented scientists and managers were required.

**India**

In an effort to reduce surplus liquidity and control the rise of the rupee's value, the government have tightened restrictions on external commercial borrowing. The higher rupee has contributed to a fall in India's export growth, which is now almost at its lowest level since 2003.

There are also fears that relaxed lending to riskier borrowers by the country's banks could affect India's growth if capital inflows reduce over a sustained period. In the past four years, only 18 percent of the US\$98 billion invested in India has been in the form of long-term foreign direct investment. India is relying on short-term portfolio investment to fund its current account deficit. Two World Bank institutions have reported that India is their largest borrower and accounts for 15 percent of their total lending.

Future foreign investment could also be affected by the increasing amount of opposition to new industrial projects from environmentalists and the local population. Part of the problem is that the economic gap is widening and leaving the most vulnerable communities at risk from losing their homes and livelihoods.

**Asia Pacific**

The summit between North Korea and South Korea planned for the end of August has been postponed until early October in the wake of heavy flooding in the North. This will be only the second summit in the countries' history. North Korea's per capita gross national income was about 17 times less than in South Korea in 2006, raising hopes of an economic co-operation pact.

The Bank of Korea raised interest rates for the second consecutive month to 5 percent. The bank cited excess liquidity rather than the fear of inflation as the reason behind the rise.

Indonesia's government is planning to finance infrastructure projects for the first time since the Asian financial crisis in 1997-1998. The country's exports rose 4.3 percent to US\$9.81 billion in July and imports increased 5.55 percent to US\$5.93 billion compared with the previous month.

Taiwan has reiterated its intention to hold a referendum on whether to join the United Nations under its own name despite opposition from the US and China.

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

State linked investment funds in Singapore and Qatar are interested in buying almost one third of the London Stock Exchange from the US Nasdaq market.

**Russia/CIS – Car Industry Revs Up**

In 2000, the Russian car industry was at a crossroads. The previous year, Russian new car sales ranked only sixth in Europe, with sales less than 25 percent of that achieved by Germany, despite its long term growth potential and the largest population in Europe (149 million people). Since 2000, the industry has turned around and is currently one of the investment hotspots in the industry. At the current rate of growth, Russia's expected 2.3 million units for 2007 approaches Germany's 3 million plus cars per year.

The success is due to several factors including the growing numbers of middle class purchasers, an increase in the disposable income of consumers, and improved credit facilities. This has attracted foreign investment with production of foreign cars in the country forming the bulk of the industry's output. In 2006, the sales of foreign cars increased by 63 percent with an annual growth in the industry of almost 30 percent from 2005. Forecasts state that the volume of cars sold should increase by more than a third by 2011.

Whilst the car industry overall is booming, the domestic car manufacturers are seeing their slice of the action decrease with predictions of a market share of only 27 percent by 2014. Fewer plants producing domestic models, having retooled to assemble foreign cars, are only part of the problem. Although cheaper than foreign models, 'home grown' cars are outdated and considered inferior in comparison.

Despite the lowering market share, the Lada remains the best-selling brand in Russia, selling just over 740,000 in 2006. Unfortunately, the cheapest Lada models do not comply with any present industry standards in terms of emissions or safety and it is likely that their makers, AvtoVAZ, will need to cease making them in favour of better models in the future.

In April 2007, Russia's deputy Prime Minister, Sergei Ivanov, stated that there are no 'promising' Russian models at the moment and there is no 'viable future' for Russian car companies. The statement is a complete turn around from 2002 when Russian bureaucrats were told that Russian made cars would gradually replace the Kremlin fleet.

Initially foreign car manufacturers were present in Russia selling imported new and used cars, including BMW, Citroen, Ford, and at one time the now bankrupt

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

Daewoo. Ford, who entered the Russian market in 2000, was the first foreign company to assemble cars in Russia from imported parts when it launched its US\$150 million plant near St Petersburg in 2002.

An agreement reached with the federal authorities allowed Ford exemption from import duty on imported components, on the condition that, by 2007, 50 percent of those components would be locally produced. This 'special customs zone' was the second regulation to stimulate output of foreign cars in Russia, the first being to raise import tariffs on used cars. Most of the world's leading car manufacturers and local companies have now signed similar agreements to the Ford agreement and are either currently assembling popular foreign cars with Russian partners or planning to open new plants.

In 2006, the market for new imported cars was 71 percent of the market. At the same time, sales of foreign brand cars assembled in Russia grew by a massive 87 percent and doubled in value to US\$4.4 billion. This was shared between ten global car manufacturers assembling cars in Russia. One of them, Renault, plans to double its current output of cars to 160,000 Dacia Logans a year by 2009. Ford is expecting to exceed the 118,000 vehicles it sold in 2006 and will be helped by their recent acquisition of a 72 percent stake in an automobile plant set in the south of Romania. The plant originally belonged to South Korea's bankrupt Daewoo and was purchased by the Romanian government last year.

Other Western auto companies are rushing to increase their share of this rapidly expanding market, including Volkswagen AG, General Motors Corporation Renault SA, Suzuki Motor Corporation and General Motors Corporation. It is expected that global car manufacturers will invest around US\$1.8 billion in new assembly plants by 2010.

One of the main movers in the Russian auto industry this year has been Russian billionaire Oleg Deripaska, who owns the holding company, Basic Element, which is involved in firms as diverse as aircraft, car manufacturers and insurance companies. Basic Element already controls GAZ, Russia's second-largest auto company and late last year GAZ reported that they would be undertaking three new ventures with Magna International, the Canadian auto parts supplier. In May, Deripaska agreed to invest US\$1.54 billion in Magna, which was widely believed to be the leading contender to buy Chrysler.

In August, amid speculation that he might be interested in purchasing Land Rover and Jaguar, Deripaska purchased a 5 percent stake in General Motors. The share in GM, estimated at worth almost US\$900 million, really demonstrates that GAZ intends to alter the Russian home made car image by producing more competitive models.

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

The advantages for Russian made cars to date have been customer loyalty, low prices and easily accessible maintenance. As Russian cars begin to reach the standards of foreign competitors, the benefit of low prices will reduce as production costs increase. Likewise, spare part manufacturers for foreign cars will be attracted to Russia in the wake of the many foreign car manufacturers already vying for their share of the market. With two of their advantages now gone, the domestic car industry will only have customer loyalty, which will surely diminish if they cannot produce a worthwhile alternative to their competitors.

The survival of the domestic industry relies on their ability to produce cars, which are comparable with foreign competition in terms of comfort, style, emissions and safety. In 2006 the penetration rate was just 0.2 percent with only 31 million vehicles for 142 million people. Undoubtedly, the Russian auto market still has plenty of scope for development and will remain so for the foreseeable future.

**Economic Case Study – A Family Heritage**

The name of Tata is synonymous with high-powered business, philanthropy and good business practice. Credit for its recent growth must go to its present chairman Ratan Tata but the roots of the Tata group go back much further. The achievements of Ratan Tata's ancestors have been the building blocks that have made the Tata Group the largest conglomerate in India today.

The first person from a family of Parsi Zoroastrian priests to enter the business world was Nusserwanji Tata, who moved to Bombay. His son Jamsetji Tata was born in 1839 and joined his father's trading firm in 1858, one year after the Indian uprising, which was quelled by the British Government. Ten years later, Jamsetji started a trading company and, in 1877, launched a cotton mill, which he named The Empress Mill when Queen Victoria was proclaimed empress of India.

He was a man of vision and devoted a lot of his time to setting up an iron and steel company, travelling to Europe and the US for technical advice. The Tata Iron and Steel Corporation was set up just three years after his death in the newly built Jamshedpur which was named after him. It is reported that, having been refused entry to a British hotel, he decided to set up the world's finest hotel. The Taj Mahal Hotel in Mumbai opened in 1903 with views of the Arabian Sea and outstanding architectural features. Its 565 rooms and 45 suites have been used by Maharajas, Princes, Kings, Presidents, CEO's and celebrities from all over the world and was the foundation for the Taj Group of Hotels.

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

Apart from developing his business, he was well ahead of his time in his attitude towards his labour force, instituting a pension fund in 1886 and starting to pay accident compensation in 1895.

Following the death of Jamsetji in 1904, it fell to his elder son Dorabji Tata to bring to fruition the ideas initiated by his father. A hydroelectric scheme, with the objective of supplying cheap and clean electric power to Mumbai was achieved in 1910, followed a year later by the establishment of the Indian Institute of Science. Under Dorabji's leadership, the Tata Group was formed adding a further two hydroelectric power companies, a large edible oil and soap company, two cement companies and one of India's leading insurance companies.

In 1910 he was knighted for his contributions to industry in British India. During his period of tenure he made further improvements to the working conditions of the labour force such as pioneering the eight hour day in 1912, long before it was accepted in the US or Europe. Tata Steel introduced leave with pay in 1920, not made a legal requirement in India until 1945, and set up a provident fund in the same year, which was not legalised until 1952.

Well known for his philanthropy and generous donations to a variety of institutions during his life, shortly before his death he established the Sir Dorabji Tata Trust Fund to be used 'without any distinction of place nationality or creed' for the advancement of learning and research, the relief of distress and other charitable purposes.

A cousin by marriage to Jamsetji, Sir Nowroji Saklatvala, then took on the chairmanship of the Tata Group for six years until his death, which launched Jehangir Ratanji Dadabhoy Tata (better known as JRD Tata) into the chairman's position at the age of 34 years. JRD was also a member of the Parsi Zoroastrian community of India, born in the same year that Jamsetji Tata died and was Nusserwanji's great-nephew.

Even before he became chairman he is credited with being the driving force behind the historic merger of 11 cement companies into the Associated Cement Companies Limited. At that time the Tata Group was already India's biggest business conglomerate and under his leadership the Tata assets grew from Rs 620 million (over US\$15 million) to Rs 100 billion (almost US\$ 2.5 billion) by 1990. During his lifetime the business entered many new areas of business too numerous to mention here. The Tata labour force enjoyed subsidised housing, free medical and hospital treatment and free education and the Tata Group was way ahead of government legislation in terms of labour practices.

---

## The Semiconductor Monthly Update Report

---

### September 2007

---

Building up the strength of the many businesses was not always easy. Under colonial rule until 1947, India was hindered by foreign exchange difficulties for almost 40 years after independence. Then from 1964 to 1991 severe government controls on big business further slowed the growth of the Tata Group.

JRD was highly regarded for his management style (by consensus) and his commitment to professionalism in business. His leadership and nature inspired and encouraged others. Likewise, his patronage of the Arts in India, dedication to developing numerous active charities and treatment of the Tata labour force earned him global respect.

Jamsetji Tata, Dorabji Tata and JRD Tata plus others in the Tata family have all demonstrated the strength to carry out their visions, not only for the sake of business, but for the development of India, and to improve the lives of others. The Zoroastrian faith, to which all three of these men belonged, is one of the world's oldest religions and their beliefs can be summed up by the maxim: Good Thoughts, Good Words, Good Deeds. The faith is about action, with Zoroastrians working towards improving the local community and society in general. Followers giving generously to charities and supporting educational and social initiatives often demonstrate this. With this in mind, one can better understand why a multinational business conglomerate in today's world has 66 percent of its ownership based in charities and only 3 percent owned by the family of Tata.

Even today, the 2007 vision for the Tata Group states that they intend to 'seize the opportunities of tomorrow and create a future that will make us an EVA positive company' and 'continue to improve the quality of life of our employees and the communities we serve'. Therefore, the family traditions continue.

## Market Trends – SC Business Models

### Performance Depends On Your Business Model

The fabless semiconductor industry is showing not only a higher growth rate but also many firms are showing a higher profitability than the Integrated Device Manufacturing type companies. Foundry business can be even more profitable but this profitability found to be more erratic.

Chipless, fabless, IDMs and wafer foundries all play in the same sandpit - but some are more profitable than others. Where a company fits in terms of its basic business model has an impact in terms of growth and profitability. Future Horizons 'index of revenue' and 'Profit Before Tax (PBT) divided by revenue'

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

from the base Q3-2000 = 100 percent gives an indication of growth and profitability per quarter and by sector over the past seven years.

**Chipless Companies**

The quarterly results measured from Q3-2000 for the chipless companies reviewed have been analysed and look relatively good. They show that the group of companies together held their joint revenue index at 25-35 percent above the Q3-2000 initial value for the first 8 quarters up until Q4-2002, at which time this group of chipless companies made a loss. Immediately following this quarter revenues rose to above one hundred percent of the Q3-2000 start figure, with the largest growth period starting recently on Q4-2005 peaking at Q4-2006.

Despite this solid revenue performance, the profit ratio has been disappointing and has never recovered to the Q3-2000 figure. After falling, profits went negative in Q1-2003 and then rose to 88 percent of the original number before falling back to its current 50-60 percent level until Q3-2006. The last three quarters Q4-2006 to Q2-2007 have also seen good growth but profits fell to around 40 percent of the Q3-2000 number, partly explained by the weak dollar effecting European-based ARM the largest chipless company in the survey, Figure A1.

The dip and therefore the negative margin in Q4-2002 was partly due to lack of profitability and industry restructuring in MIPS and ParthusCeva. The rise in net margin in Q3-2004 was a general rise in profitability particularly at MoSys in that quarter. Since Q1-2005 and despite increased gross margins typically 85 percent, chipless net margins have halved to ten percent, Figure A2.

It should be noted that over this period the reliance of unit-based royalties has in the past dipped, but has now risen and now 45-50 percent of total revenues, Figure A3. During 2001 and 2002, revenues were heavily reliant on lump sum up-front and phased payment for licensed use of IP. Prior to this unit-based royalties in companies such as MIPS and Rambus kept the royalty-based number high. The lump-sum mode of business then fell and the chipless business changed by having less upfront cash. Rewards have now become more unit-based and more dependent on the success of end product in the market.

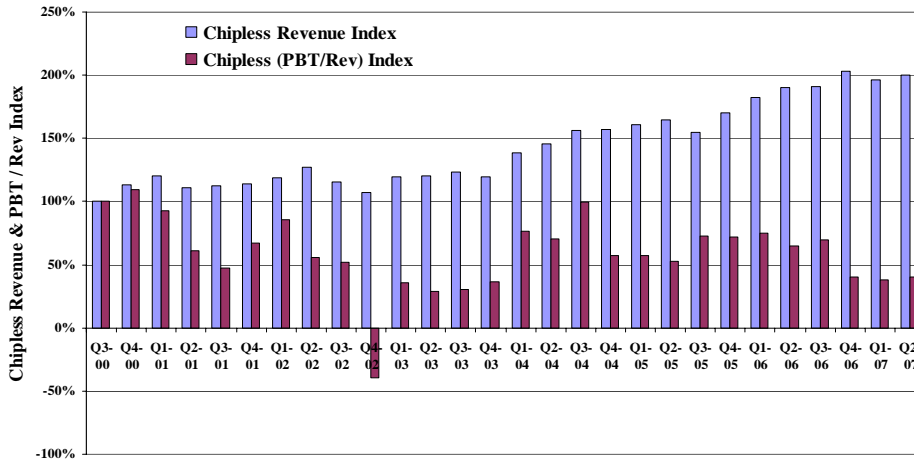
**Fabless Companies**

The fabless revenue index has held up fairly well for the companies reviewed, falling to 81 percent of the original figure in Q2 and Q3-2001 and then recovering by Q1-2002. After a flat revenue period during 2002 the index has steadily risen to over twice of the revenue at the start point, although this substantial growth is beginning to slow during 2007, Figure A4.

The Semiconductor Monthly Update Report

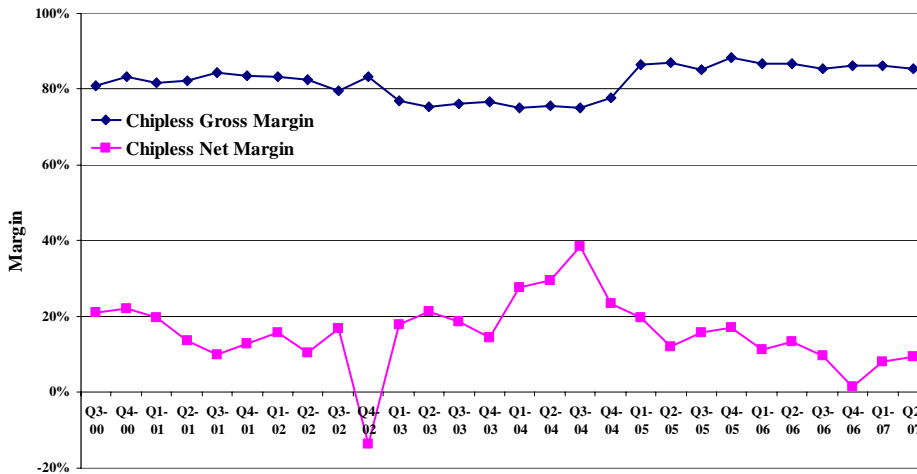
September 2007

Figure A1 - Chipless Revenue & Profit Indices



Source: Company Reports/Future Horizons

Figure A2 - Chipless Gross & Net Margins

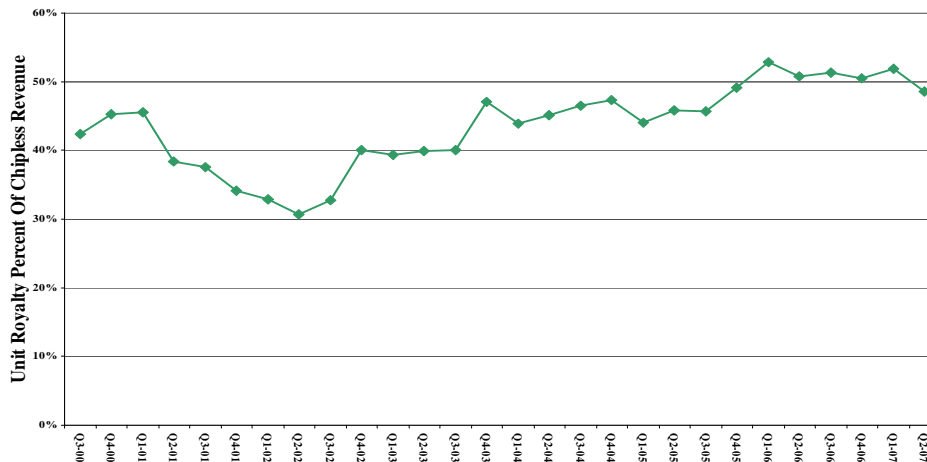


Source: Company Reports/Future Horizons

## The Semiconductor Monthly Update Report

# September 2007

**Figure A3 - Percent Of Chipless Revenue In Unit Royalties**



Source: Company Reports/Future Horizons

The story on profit is a different matter however, with losses in Q1 and Q2-2001 and a specific low performance in Q3-2002 and general poor and low profit performance over years 2001, 2002 and 2003 relative to the start period. Fabless companies seem to have experienced a 'double dip' of profitability during 2001 and 2002. The sector has only reached seventy percent of year Q3-2000 profits in Q4-2005 and fifty percent for the remainder of the period - despite good revenue growth. Fabless gross margin has been less stable than that of the chipless industry, having a rocky period between Q1-2000 to Q4-2003, but levelling out at 50-52 percent for the remainder of the period. Net margins are levelling out to 13-15 percent after a rocky period in 2001-2002 particularly caused by low profits at Altera and Broadcom, Figure A5.

### Integrated Device Manufacturers (IDMs)

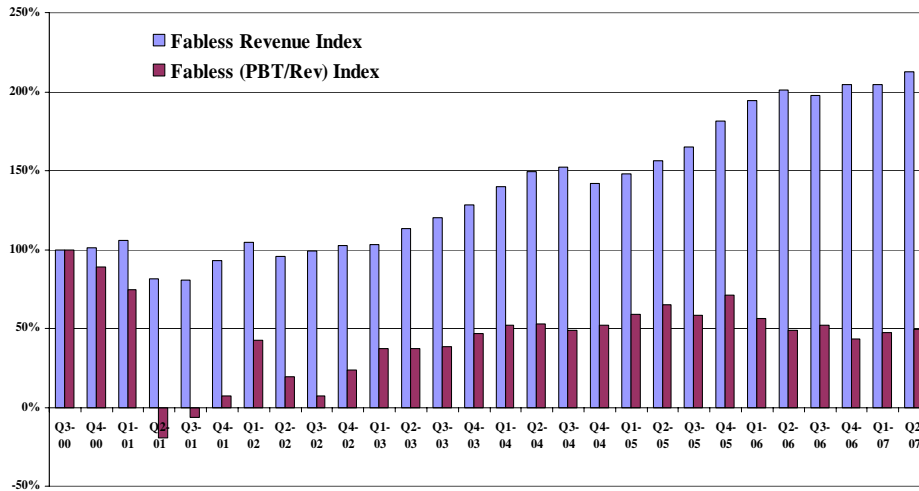
Alongside the chipless Intellectual Property (IP) vendor and fabless business models are the Integrated Device Manufacturers (IDMs) - The business model used by the largest part of the market.

An IDM has almost the original semiconductor business model of the early 1960s, with the exception of having hived off silicon blank wafer production, mainstream Electronic Design Automation (EDA) and production and test equipment development and manufacture.

The Semiconductor Monthly Update Report

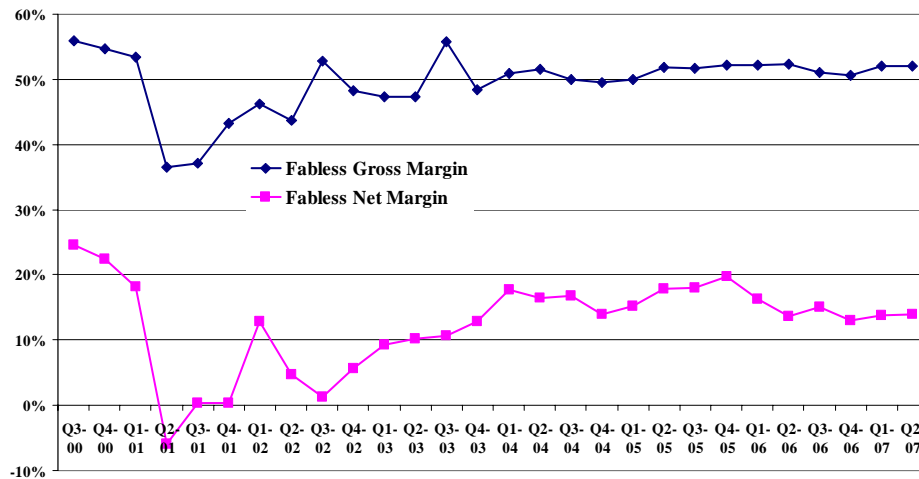
September 2007

Figure A4 - Fabless Revenue & Profit Indices



Source: Company Reports/Future Horizons

Figure A5 - Fabless Gross & Net Margins



Source: Company Reports/Future Horizons

---

**The Semiconductor Monthly Update Report**

---

**September 2007**

---

As well as product design and marketing, IDMs, unlike the fabless business, develop the manufacturing processes they utilise in their business. This gives the IDM the advantage of a close intimacy with manufacturing and this allows processes to be tuned to the requirements of products. On the other hand a fabless company does not have cash outlay and operational issues of building and running state-of-the-art manufacturing plants and can choose between different foundries for its supply. As in the fabless case, the index of total revenue index of the group of IDM companies reviewed fell in Q2 and Q3-2001, but IDMs recovery was much slower and only reached ten percent above the initial value by Q5-2005 compared to the fabless over 80 percent above at that data point. The profit index fell between Q1-2001 to Q3-2003 then rose in Q4-2003, immediately plateaued, but has been falling since Q4-2005.

In this low profitability state it held at only 40-50 percent of the initial value for five quarters, and fell again in Q2-2007, mostly due to Infineon, Intel and ST results, Figure A6. Over the period, IDM gross margins fell from 58 percent to as low as 32 percent, but more recently has flattened out to 45-46 percent, excepting Q2-2007 which has come in at just over 42 percent. Net margins fell from 26 percent in Q3-2000 and because of semiconductor market conditions became negative for a number of periods during Q2-2001 to Q2-2003. After this IDM net margins recovered to settle down at 14-16 percent, except for a 20 percent margin in Q2-2006 the rise partly due to gains made in the sale of TI's sensor business. With this exception since Q4-2005 there has been a downwards trend of both IDM gross and net margins to ten percent, Figure A7.

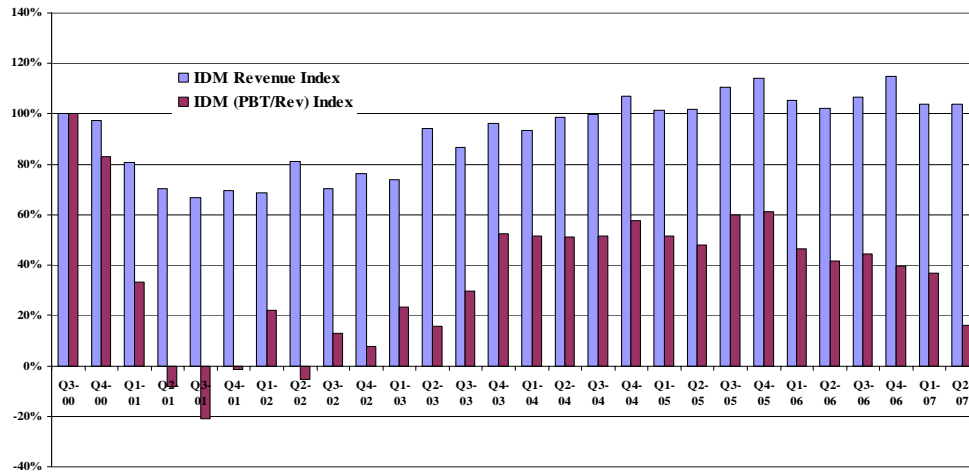
**Pure-Play Foundries**

Pure-play foundries process silicon wafers using masks generated from other company's designs. Both fabless companies and to a lesser extent IDMs depend on pure-play foundries for the manufacture of wafers of their products. About two-thirds of the pure-play foundry output goes to fabless companies. Foundry revenues fell to 40-50 percent of initial value causing three quarters of negative profitability from Q2-2001. Revenues began a recovery, but ultimately fell back after a peak in Q2-2002 again causing profitability problems, Figure A8. A true recovery started in Q2-2003 leading to revenues in Q2 to Q4-2004 greater than the initial revenues in Q3-2000 and profitability started to follow suit rising to over 80 percent of the initial value. Profitability then fell back to 45-60 percent of the initial value from Q4-2004 to Q2-2005, but more recently recovered sharply to reach original profitability in Q1-2006. Despite revenues maintained above the initial start index from since Q3-2005 the index of profitability started to fall from Q2-2006 and has continued to do so.

The Semiconductor Monthly Update Report

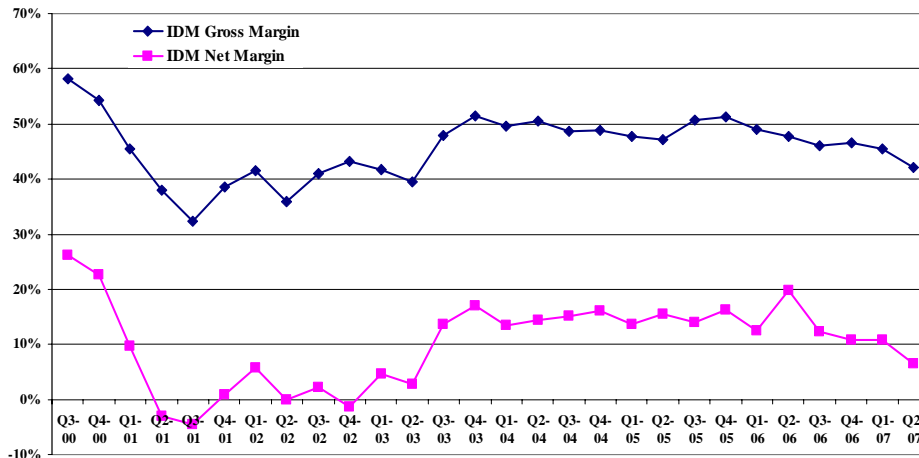
September 2007

Figure A6 - IDM Revenue & Profit Indices



Source: Company Reports/Future Horizons

Figure A7 - IDM Gross & Net Margins

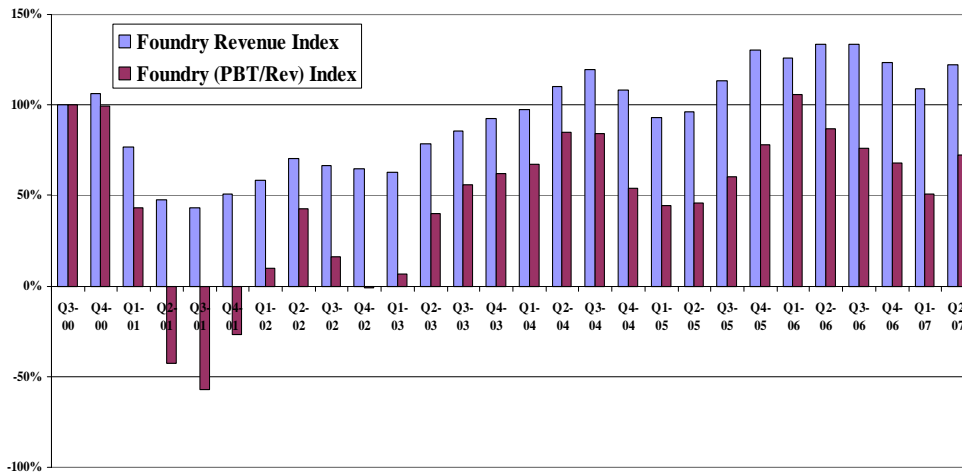


Source: Company Reports/Future Horizons

## The Semiconductor Monthly Update Report

### September 2007

**Figure A8 - Pure-Play Foundry Revenue & Profit Indices**



Source: Company Reports/Future Horizons

Both gross and net foundry margins appear very sensitive to the market conditions for their end customers, the fabless and IDM companies of this world. The margin falls in 2001 and 2002 reflect the IC unit falls that started in Q1-2001 and continued until Q4-2001 and to a lesser extent reflected the shorter dip in IC unit starts in early 2003. Foundry margins appear volatile and are recovering to a gross margin of 30-40 percent and net margin of 20-35 percent, Figure A9.

Please note that the anomalously high net margin in Q1-2006 is a one-off rise caused by a change in accounting principles at UMC Taiwan.

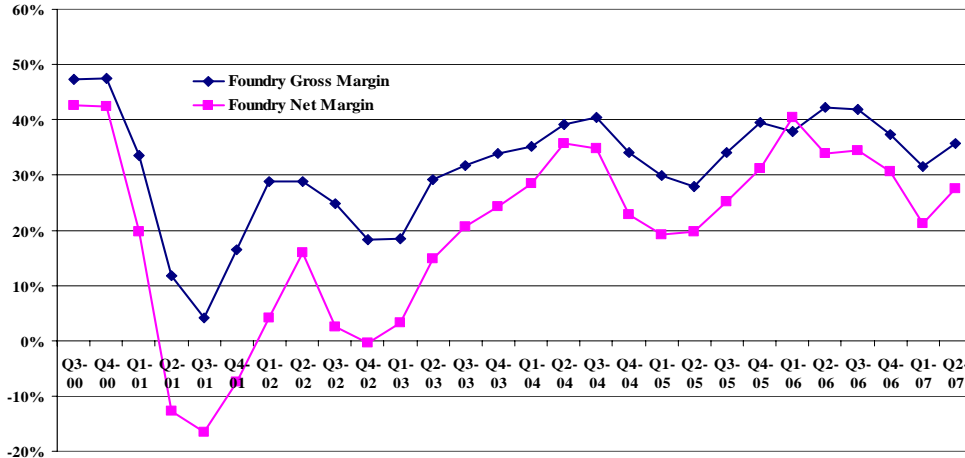
#### Business Model Performance

In the sample of 24 companies taken (7 chipless, 7 fabless, 7 IDM and 3 foundry) the pure-play foundry industry, although volatile, appears to have the greatest net margin and despite it falling rapidly over some recent quarters a good possibility of maintaining this higher-profitability position. Foundries can make double the net margin than both fabless and chipless companies and nearly treble that of IDMs during some periods. In general the fabless industry has also tended to be more profitable than IDMs, Table A1.

**The Semiconductor Monthly Update Report**

**September 2007**

**Figure A9 - Foundry Gross & Net Margins**



Source: Company Reports/Future Horizons

**Table A1 – Summary Of Business Model Performance**

Business Model	Gross Margin		Net Margin	
	Margin	Recent Trend	Margin	Recent Trend
Chipless	85-88%	Constant 2005-2007	20-9%	Falling
Fabless	50-52%	Slightly Up	20-14%	Falling
Foundry	42-32%	Falling Sharply	40-21%	Falling Sharply
IDM	51-42%	Slightly Down	14-6%	Slightly Down

Source: Company Reports/Future Horizons

The chipless industry, although having a high gross margin and more importantly a good net margin, is suffering a slightly falling net margin with time. It is also a small industry compared to the other sectors. The fabless firms analysed are mainly large and have been chosen because they have been publishing regular quarterly reports since Q3-2000. This means that pre-IPO or acquired or failed companies are not included. Qualcomm was not analysed because some historical semiconductor division (Qualcomm QCT) information was not publicly available.

The IDMs analysed were stand-alone IDMs and therefore not Japanese, as these tend to have profitability hidden within the larger Japanese corporations. Recently IDMs tend to have slightly lower margins than their fabless counterparts. These better fabless higher gross margin results compared to IDMs can imply a gain of

## The Semiconductor Monthly Update Report

### September 2007

effectiveness due to a freedom from wafer manufacturing costs that fabless companies have. Historically, the industry has thought that IDMs are getting better value than their fabless counterparts from the wafers they are processed in-house, but now this may not be the case. Fabless companies do not have wafer-processing research and development costs and because other elements such as marketing, design and IP are common to both business models, this advantage comes through as better net margins compared to IDMs. The smaller chipless market has been the highest growth market over the past couple of years with a strong revenue growth of 23.1 percent in 2006, Table A2.

**Table A2 – Summary Of Business Model Market**

	2006 Market	Y on Y	2005 Market	Y on Y	2004 Market
Business Model	US\$B	%	US\$B	%	US\$B
Chipless*	1.6	23.1%	1.3	18.2%	1.1
Foundry*	19.6	18.8%	16.5	-0.6%	16.6
Fabless	49.7	24.3%	40.0	10.5%	36.2
IDM	198.0	5.6%	187.5	6.1%	176.8
Semiconductor Market US\$B	247.7	8.9%	227.5	6.8%	213.0

\* Not in Semiconductor Market Total

Source: Company Reports/Future Horizons

In the last year the fabless market grew 24.3 percent following a strong 2005. The foundry sector had a strong 18.8 percent growth in 2006 following a poor and slightly negative 2005 and this was reflected in 2005 lower profitability. The largest sector of the IDM companies grew only 5.6 percent in 2006 moderately down on the 6.1 percent in 2005. What is noticeable is continuous penetration of the semiconductor market by companies using the fabless business model. Fabless companies achieved over twenty percent of the market in 2006 rising from 17.4 percent in 2005, Figure A10.

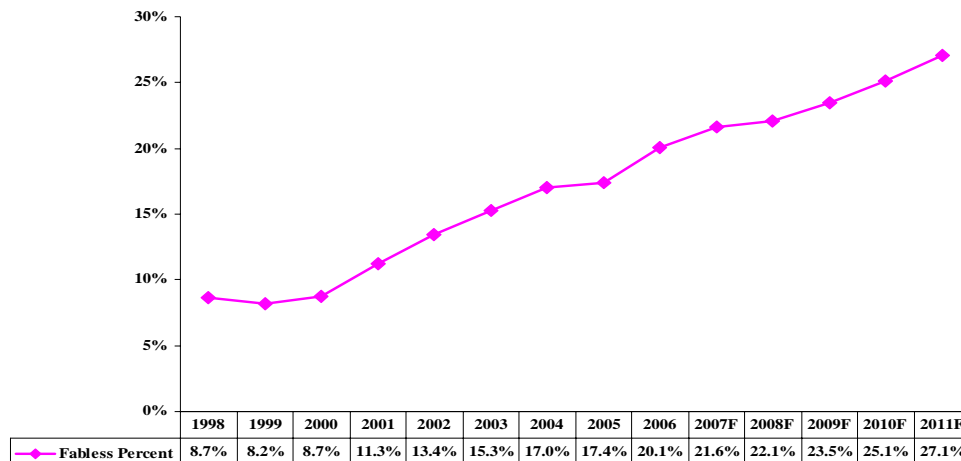
The fabless sector is outperforming the IDM sector both in terms of revenue growth and profitability and although fab ownership was seen as a necessity up until 1990 these margin results put a short-term pressure on companies to move to the fabless model. In the longer term however, the closeness between designer and process engineer in an IDM may give the IDM the leverage for its IP and its ability to develop non-processes for specific requirements.

## The Semiconductor Monthly Update Report

### September 2007

Keeping an eye on the dynamics of the industry and the various business models is important and has major importance in company profitability. Semiconductor companies must remain aware of changes in business models however subtle.

**Figure A10 - Fabless Percent Of Semiconductor Market**



Source: Future Horizons

### Semiconductor Spotlight – European IP Firms

Despite a number of acquisitions in this sector, the number of independent chipless, fabless and IC design houses in Europe continues to rise according to Future Horizons. The number of these start-ups is up almost 4 percent over 2005 although this was lower than the rise in 2005. The UK again stands out as having three times as many companies as other European regions with the exception of Israel, which is also included in the research, Figure B1.

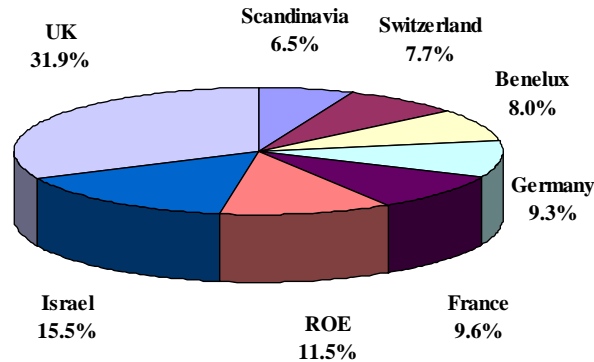
A recently published research report on the subject, which covers independent IC design companies in Western Europe and Israel, illustrates the size of company activity by showing each profile in a 'page per company' format. It also shows tables of companies alphabetically, and also by country, by 'business model' that is by fabless, chipless or IC contract design. This useful reference work also shows analysis in terms of company IC design skills and IP sorted into categories, including analogue, RF, CPU, automotive, encryption, sensor interface radio baseband, and verification etc, thus assisting likely customers to home in on the skills of a likely partner, customer or competitor.

---

**The Semiconductor Monthly Update Report**
**September 2007**


---

**Figure B1 - Geographical Location Of Companies, 2006**  
(Percent Of Companies)



Source: Future Horizons

'The UK position is no surprise and Israel has always been a source of new company generation, but Germany and France, despite their size, lag behind the leading two by some margin'. 'The smaller Greece and Switzerland has seen the largest percentage new design company growth in recent times', said Chris Ryan, semiconductor industry Analyst, Future Horizons.

***'The European Fabless Semiconductor Report, 2007 Edition', can be purchased from Future Horizons at GBP 2,600. Details of individual company address, profile, and skills data is also available in Excel spreadsheet format for an additional GBP 400 for anyone purchasing a copy of the above report.***

[http://www.futurehorizons.com/new\\_web/westmkt/dhreport/dhreport.htm](http://www.futurehorizons.com/new_web/westmkt/dhreport/dhreport.htm)

**IEF2008 Pre-Announcement - May 7-9, 2008 - Madinat Jumeirah, Dubai, UAE**

***Future Horizons is pleased to announce that its 17<sup>th</sup> Annual International Electronics Forum (IEF2008) will take place from May 7-9, 2008 at the Madinat Jumeirah, Dubai, UAE - <http://www.madinatjumeirah.com/> - under the auspices of the Dubai Silicon Oasis Authority. Mark your calendar NOW and visit our website at [http://www.futurehorizons.com/new\\_web/forums/ieforum/ieforum.htm](http://www.futurehorizons.com/new_web/forums/ieforum/ieforum.htm) for details.***

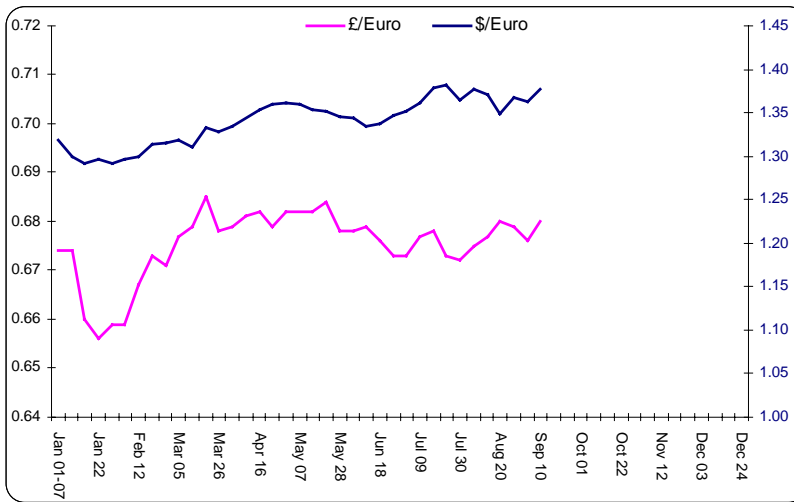
**The Semiconductor Monthly Update Report**

**September 2007**

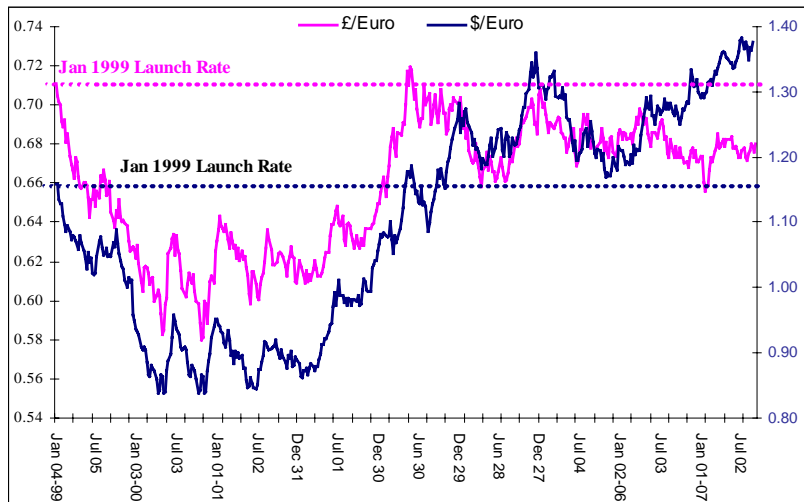
**Euro Exchange Rate**

Figure R1 shows the weekly Euro exchange rate vs the US\$ and UK£ for 2006. Figure R2 shows the historical trend since its 1<sup>st</sup> Jan 1999 launch.

**Figure R1 - 2007 Euro Exchange Rate Trend**  
(Euro vs. US\$/UK£)



**Figure R2 - Euro Exchange Rate History, 1999-To Date**  
(Euro vs. US\$/UK£)



Source: Financial Times/Future Horizons

---

**The Semiconductor Monthly Update Report**
**September 2007**


---

## Tired Of Over Paying For Market Research Reports?

**We ARE** Europe's leading semiconductor industry analyst. **We DO NOT** charge stratospheric prices for so-called 'information services', essentially a hyped-up name for ad hoc/multi-client reports. **NOR do we** hold our clients to ransom by the age-old technique of bundling up products to lock out competition. **We DO**, however, offer a **better value alternative**, with a **research efficiency** and **analysis** that is **second to none**.

We know old habits are hard to break, but with budgets tight and discretionary spending curtailed, the time for change is long overdue ... **Future Horizons is proud to be at the forefront of this change.** This is no dream, just a win-win situation for us both. **You save** substantially on your valuable market research dollars, and the more you support us, **the more we can help you.**

- ❑ **Market Research Reports** - *Covering The Basic Industry Statistics*
- ❑ **Informed Analysis** - *From Industry-Experienced Experts*
- ❑ **Monthly Newsletters** - *For The Latest News & Information*
- ❑ **Dedicated Research** - *For Added Insight & Analysis*
- ❑ **Flexible Resource Support** - *From A Few Hours To A Custom Study*
- ❑ **Clearly Defined Objectives** - *You Get Exactly What You Want*
- ❑ **Predefined Budget** - *You Pay Only For What You Need*

Founded in 1989, Future Horizons offers the highest possible standards in all of its activities, be it industry reports, consulting assignments, engineering support services, or industry symposia. Our current range of research reports includes:

- ❑ Semiconductor Monthly Update Report (12 issues p/a)
- ❑ Penn On Paper Newsletter (12 issues p/a)
- ❑ East European Report Newsletter (12 issues p/a)
- ❑ Annual Semiconductor Report
- ❑ Semiconductor Application Markets Report
- ❑ European Fabless Semiconductor Report (Optional Database)
- ❑ European Semiconductor Wafer Fabrication Capacity (Optional Database)
- ❑ Russian Electronics Industry Report
- ❑ Russia & The Other Countries Of The Former USSR IC Manual
- ❑ East European Semiconductor Report

---

## The Semiconductor Monthly Update Report

### September 2007

---

## Summary Of Key Reports

Brochure downloads are available from our website. Reports can be purchased online, by fax, or email and are supplied in A4-ring binder and CD-ROM format. Respect copyright laws, multi-user/site licenses are required for additional users and/or posting on company Intranets.

### Semiconductor Monthly Update Report

[http://www.futurehorizons.com/new\\_web/westmkt/mureport/mureport.htm](http://www.futurehorizons.com/new_web/westmkt/mureport/mureport.htm)

A CEO favourite, this report is all a busy executive needs to keep in touch with industry trends. E-mailed monthly, the report provides a useful industry momentum indicator by compiling 12-monthly rolling charts for Units, Average Selling Prices (ASP) and Revenues broken down by total SC, IC, Optoelectronics and Discretes. Also included is a review of the world economy, broken out by region, plus a monthly feature on a key semiconductor market driver. The link between the economy and the semiconductor industry is not perfect but by measuring and understanding the impact of wafer fab capacity on lead-times and prices, and by monitoring the level of system OEM, distribution and semiconductor company inventory, more sense can be made of this fundamentally unstable industry. The report focus is on in-depth analysis and the underlying industry trends.

### Annual Semiconductor Report

[http://www.futurehorizons.com/new\\_web/westmkt/esreport/esreport.htm](http://www.futurehorizons.com/new_web/westmkt/esreport/esreport.htm)

This two-volume report provides market analyses and forecasts of the worldwide and European semiconductor market (Volume 1), as well as a detailed analysis of the 27 key semiconductor end-user applications and industry market drivers, collectively accounting for three quarters of the total IC market (Volume 2). This value-added bundle is a must-have for anyone interested in the global semiconductor market and European detail.

### Semiconductor Application Markets Report

(Previously called the Key Market Drivers Report)

[http://www.futurehorizons.com/new\\_web/westmkt/kmreport/kmreport.htm](http://www.futurehorizons.com/new_web/westmkt/kmreport/kmreport.htm)

Volume 2 of the Annual Semiconductor report is available separately as the Semiconductor Application Markets Report. Individual chapters describe how each application works, the technology used, the unit sales history and forecast, the semiconductor content and the associated semiconductor market size. This vital research resource volume is a proven industry favourite. Individual applications are also available as separate reports; please call for details.

### European Fabless Semiconductor Report

(Previously called the European Chipless & Fabless IC Design House Report)

[http://www.futurehorizons.com/new\\_web/westmkt/dhreport/dhreport.htm](http://www.futurehorizons.com/new_web/westmkt/dhreport/dhreport.htm)

This 300-page report covers the European and Israeli, chipless, fabless and independent IC design house community, and is essential for those planning the resources of subcontracting new product design, both in the semiconductor industry and the final system end product. It will also prove invaluable for authorities and government departments, planning and directing economic growth, as well as companies seeking investments, potential partners or acquisitions. As an added user benefit, the 280 strong chipless and fabless IC design house company database is available in Excel format as an optional CD extra (not available separately), with both pre-organised sorts (by country, design skill and application) and in raw data format allowing customised searches and analyses. This best-selling report has a proven track record as an invaluable research resource.

---

**The Semiconductor Monthly Update Report****September 2007**

---

**The Annual Semiconductor Report****Updated Annually - 820 Pages - Despatched As Two Volumes:****Annual Analysis & Forecast Of The  
Worldwide & European SC Industry****Topics Include**

- ❑ Semiconductor Market & Product Forecasts
- ❑ Semiconductor End-Use Markets
- ❑ Global Economic Environment
- ❑ Regional Market Analysis
- ❑ Key End Market Applications Reviewed
- ❑ 5 Year History Plus 5 Year Forecast

**Vol 1 – Product & Geographical Markets (370 Pages / 350 Figures & Tables)**  
**Vol 2 – Semiconductor Application Markets (450 Pages / 325 Figures & Tables)**  
(Vol 2 Available Separately As A Stand-Alone Report)

**- There IS No Better Value-Added Package -**

---

**The Semiconductor Monthly Update Report**
**September 2007**


---

## Semiconductor Application Markets Report

Updated Annually - Over 450 Pages / 320 Figures & Tables



## Annual Analysis & Forecast Of The Top Semiconductor Applications For The Worldwide Electronics & SC Industry

(Previously Called The Key Market Drivers Report)

**Topics Include (27 Top Applications Analysed)**

- Mobile Phone Handsets & GPS**
- Personal Computers & PDAs**
- Automotive Electronics & Robotics**
- Smartcards & RF-ID Tags**
- DVD Recorders & Players**
- Bluetooth, Wireless LANs & Wi-Fi**
- Digital STB & Still Cameras**
- Video Games Consoles**

**- Report Covers Over 82 Percent Of The Worldwide IC Market -**

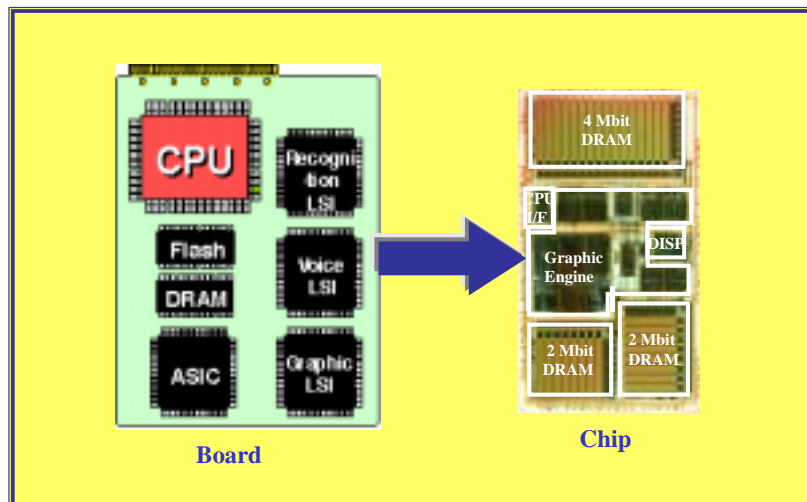
---

**The Semiconductor Monthly Update Report**
**September 2007**


---

## The European Fabless Semiconductor Report

**Updated Annually - Over 320 Companies Analysed**



### Annual Strategic Analysis & Reference Guide For The European Chipless & Fabless IC Design Industry

(Previously Called The European Chipless & Fabless IC Design House Report)

#### Topics Include

- ❑ European IC Design House Phenomenon
- ❑ IC Design House Industry Drivers
- ❑ IP Market Development
- ❑ IC Design House Market Segmentation
- ❑ IP Portfolios & Design Skills Analysed
- ❑ Over 320 Design Companies Profiled (Europe & Israel)

**- Includes The Popular European Fabless SC Database Disk -**

(Optional Extra, Available Exclusively To Report Purchasers Only)

---

**The Semiconductor Monthly Update Report**


---

**September 2007**


---

## 2007 Diary Dates

(Sign Up Now – Online @ [www.futurehorizons.com](http://www.futurehorizons.com))

Jan	<b>30<sup>th</sup> - IFS2007, Semiconductor Industry Briefing, London</b> Annual analysis & forecast of the European & WW semiconductor market
Mar	<b>12<sup>th</sup> - Silicon Chip Industry Training Seminar, London</b> Presented in layman's terms, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets
May	<b>2<sup>nd</sup>-4<sup>th</sup> - International Electronics 2007 Forum, Athens, Greece</b> IEF2007 - 16 <sup>th</sup> Annual International Electronics Industry Forum. An international forum to update market forecasts, develop new business opportunities, meet new contacts, share experiences, explore ideas, and refine strategic thinking
Jun	<b>11<sup>th</sup> - Silicon Chip Industry Training Seminar, London</b> Presented in layman's terms, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets
Jul	<b>24<sup>th</sup> – IFS - MT2007-Mid-Term Semiconductor Industry Briefing, London</b> Mid-year analysis & forecast of the European & WW semiconductor market
Sep	<b>3<sup>rd</sup> - Silicon Chip Industry Training Seminar, London</b> Presented in layman's term, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets
Oct	<b>10<sup>th</sup>-12<sup>th</sup> - International System &amp; SoC Forum 2007, Prague, Czech Republic</b> IFF2007 - 5 <sup>th</sup> Annual International System & SoC Forum. An international forum to discuss business issues within the international design & IP market, meet new contacts, share experiences, explore ideas and refine strategic thinking
Nov	<b>26<sup>th</sup> - Silicon Chip Industry Training Seminar, London</b> Presented in layman's term, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets

All seminars are available on an In-House basis

Custom presentations and seminars are also available

For more details, please call:

Tel: +44 (0)1732 740440 or e-mail [seminars@futurehorizons.com](mailto:seminars@futurehorizons.com)

# Future Horizons Order Form

Price List Effective Dec 01, 2006 (Prices Subject To Change Without Notice)

Order on-line @ [www.futurehorizons.com](http://www.futurehorizons.com). E-mail: [mail@futurehorizons.com](mailto:mail@futurehorizons.com)

**Three Easy Ways To Order: Online:  ♦ By Fax:  ♦ By mail: **

**Please Enter Our Order For The Following Publications (Check Appropriate Boxes)**

Item Report (Please note, all prices shown exclude UK VAT)	UK Pounds £	Euro €	US Dollars \$
1 <input type="checkbox"/> Semiconductor Applications Market Report - Binder plus CD-ROM <input type="checkbox"/> Intranet/Site Licence	£2,600.00 3,650.00	€3,975.00 5,600.00	\$5,400.00 7,570.00
2 <input type="checkbox"/> Annual Semiconductor Report (Includes 1 above) - Binder plus CD-ROM <input type="checkbox"/> Intranet/Site Licence	£3,000.00 4,200.00	€4,580.00 6,500.00	\$6,200.00 8,700.00
3 <input type="checkbox"/> Semiconductor Monthly Update Report - By E-Mail (1 year, 12 Issues) <input type="checkbox"/> Intranet/Site Licence	£1,500.00 2,200.00	€2,300.00 3,370.00	\$3,100.00 4,570.00
4 <input type="checkbox"/> European Semiconductor Wafer Fab Capacity - Binder plus CD-ROM <input type="checkbox"/> Optional Database Disk (only with Report/CD-ROM) <input type="checkbox"/> Intranet/Site Licence (Excluding Database Disk) <input type="checkbox"/> Intranet/Site Licence (Including Database Disk)	£2,600.00 400.00 3,650.00 4,050.00	€3,975.00 615.00 5,600.00 6,200.00	\$5,420.00 830.00 7,570.00 8,400.00
5 <input type="checkbox"/> European Fables Semiconductor Report - Binder plus CD-ROM <input type="checkbox"/> Optional Database Disk (only with Report/CD-ROM) <input type="checkbox"/> Intranet/Site Licence (Excluding Database Disk) <input type="checkbox"/> Intranet/Site Licence (Including Database Disk)	£2,600.00 400.00 3,650.00 4,050.00	€3,975.00 615.00 5,600.00 6,200.00	\$5,420.00 830.00 7,570.00 8,400.00
6 <input type="checkbox"/> Fables Semiconductor Market Update Report - Binder plus CD-ROM <input type="checkbox"/> Intranet/Site Licence	£1,500.00 2,200.00	€2,300.00 3,370.00	\$3,100.00 4,570.00
7 <input type="checkbox"/> Power Semiconductor Report - Binder plus CD-ROM <input type="checkbox"/> Intranet/Site Licence	£2,600.00 3,650.00	€3,975.00 5,600.00	\$5,420.00 7,570.00
8 <input type="checkbox"/> Russian Electronics Report - Binder plus CD-ROM <input type="checkbox"/> Intranet/Site Licence	£3,000.00 4,200.00	€4,580.00 6,500.00	\$6,200.00 8,700.00
9 <input type="checkbox"/> East European Semiconductor Report - Binder plus CD-ROM <input type="checkbox"/> Intranet/Site Licence	£2,600.00 3,650.00	€3,975.00 5,600.00	\$5,400.00 7,570.00
10 <input type="checkbox"/> Penn On Paper Newsletter (1 year, 12 Issues) <input type="checkbox"/> Intranet/Site Licence	£500.00 1,100.00	€765.00 1,700.00	\$1,040.00 2,290.00
11 <input type="checkbox"/> East European Report Newsletter (1 year, 12 Issues) <input type="checkbox"/> Intranet/Site Licence	£500.00 1,100.00	€765.00 1,700.00	\$1,040.00 2,290.00
12 <input type="checkbox"/> International Electronics Forum Proceedings - Includes Postage	£370.00	€620.00	\$860.00
13 <input type="checkbox"/> International System & SoC Forum Proceedings - Includes Postage	£370.00	€620.00	\$860.00
14 <input type="checkbox"/> International Forecast Seminar Proceedings - Includes Postage	£415.00	€690.00	\$945.00
15 <input checked="" type="checkbox"/> Shipping Costs (courier)	£20.00	€80.00	\$125.00
<b>Net Amount Due</b>	£	€	\$
VAT UK VAT may be applicable on some items, please call/check invoice	£	€	\$
<b>Total Amount Due (Pre-payment or PO number required)</b>	£	€	\$
Bank Details (Please Use The Correct Account) BIC: RBOS GB 2L Royal Bank of Scotland, 3A Edinburgh Road, PO1 1DA, ENGLAND. IBAN: GB02RBOS16282411686316		RBOS GB 2L GB81RBOS16109010001457	RBOS GB 2L GB86RBOS16630000079565

*(Respect International Copyright Laws - Multi User/Internal/Intranet Distribution Needs A Site Licence)*

**Buyer Is Responsible For All Bank Transfer Charges**

**Full Name:** \_\_\_\_\_ **Job Title:** \_\_\_\_\_

**Company:** \_\_\_\_\_ **VAT/MWS/TVA/IVR No:** \_\_\_\_\_

**Tel:** \_\_\_\_\_ **Fax:** \_\_\_\_\_ **E-mail:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City/ZIP/Post Code:** \_\_\_\_\_ **Country:** \_\_\_\_\_

Please Invoice, PO #: \_\_\_\_\_  Bank Transfer Authorised  Cheque Enclosed (drawn on a **UK bank** only)

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

<b>US Affiliate: Pathfinder Research Inc</b> 1620 Old Oakfield Road, Suite D202 San Jose, California 95131, USA Tel: + 1 408 437 1905 • Fax: + 1 408 437 8929 Email: hfeeny@pathfinder-research.com	<b>Russian Affiliate: Electronintorg Ltd</b> 24/2 Usievicha Street 125315 Moscow, Russia Tel/Fax: +7 495 151 1639 Email: elers@redline.ru	<b>Far East Affiliate: Semicon Research Ltd</b> Kagami Ishi Bldg., 1-11-7, Bunkyo-Ku Yushima, Tokyo 113, Japan Tel: + 81 3 5684 3941 • Fax: + 81 3 5684 3943 Email: ohtake@semiconresearch.com
---	---	--



# Future Horizons



Head Office: Blakes Green Cottage, Stone Street, Near Seal, Sevenoaks, Kent TN15 0LQ, England  
Tel: +44 (0)1732 740440 • Fax: +44 (0)1732 740442 • e-mail: mail@futurehorizons.com • www.futurehorizons.com

## Europe's Leading Semiconductor Industry Analyst



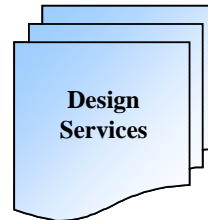
Research  
Reports



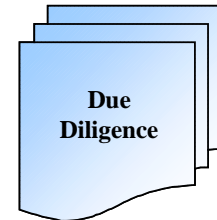
Consulting  
Projects



Seminars  
& Forums



Design  
Services



Due  
Diligence

1989-2007  
19th Year Of Service

Established in April 1989, Future Horizons is Europe's leading independent semiconductor industry analyst. It provides market research, technology and design evaluation, training and other business support services for use in opportunity analysis, business planning and new market development. Emphasis is placed on the worldwide microelectronics and electronics industry, and European market environment. Its industry information seminars and forums are widely considered to be the best of their kind.

Malcolm Penn is the founder and CEO of Future Horizons, with over 40 years experience in the electronics and semiconductor industry. He has worked extensively throughout Europe as well as in the United States, the former USSR, Japan and Korea, and was an early pioneer of pan-European research and product development collaboration in the 1970s during his tenure with ITT Europe. His industrial experience has involved him with all aspects of the management, manufacturing, marketing and use of electronic components, particularly semiconductor devices.

Four Decades Of  
Semiconductor  
Experience

100+ Man-Years  
Of Research  
Resource

With more than 100 man-years experience in the semiconductor and related industries, Future Horizons' research reports and consulting services offer a high quality, cost-effective, flexible alternative to expensive subscription-style, market research. Our IC experience commenced with the industry in 1961, *from the first commercial IC to SOC integration*. For all of your semiconductor business development needs ...

***Let Future Horizons Save YOU Time & Money***

<b>US Affiliate: Pathfinder Research Inc</b> 1620 Old Oakfield Road, Suite D202 San Jose, California 95131, USA Tel: + 1 408 437 1905 Fax: + 1 408 437 8929 E-Mail: hfeeney@pathfinder-research.com	<b>Russian Affiliate: Electronintorg Ltd</b> 24/2 Usievicha Street 125315 Moscow, Russia Tel: +7 495 155 4026 • Fax: + 7 502 224 5767 E-mail: elers@redline.ru	<b>Far East Affiliate: Semicon Research Ltd</b> Kagami Ishi Bldg., 1-11-7, Bunkyo-Ku Yushima, Tokyo 113, Japan Tel: + 81 3 5684 3941 • Fax: + 81 3 5684 3943 E-Mail: ohtake@aol.com
---	--	---