

Asia Taiwan

Technology Hardware & Equipment

11 November 2008

Taiwan DRAM Sector

Committed to memory:

Taiwan outlines DRAM plan

Matt Cleary

Research Analyst
(+886) 2 2192 2838
matt.cleary@db.com

Derrick Yang

Research Assistant
(+886) 2 2192 2847
derrick.yang@db.com

With repayments looming, MoEA sketches out DRAM rescue plans

The Taiwan government yesterday began to clarify the steps that may be taken to save struggling DRAM makers. In this report, we outline the forthcoming debt repayment schedules for the four companies under our coverage, and speculate on how this situation may evolve. Our DRAM thesis remains unchanged – that over the coming year, increasing financial pressures will drive consolidation, but the industry's oversupply is likely to abate somewhat.

Not letting the chips fall where they may

Taiwan's Ministry of Economic Affairs has laid out a number of steps that it hopes will be sufficient to avert bankruptcies among financially challenged DRAM makers, including 6-month debt repayment extensions, the possibility of continued short-selling curbs and nebulous promises of R&D assistance. These efforts are broadly in line with our expectations, as well as what we have been hearing from government officials of late.

Refinancing requirements for DRAM makers to surge in 1Q09

We estimate that the DRAM sector's debt refinancing requirements will nearly quintuple in 1Q09, from this quarter's NT\$10bn to more than NT\$64bn in 1Q09. We believe that NT\$143bn worth of financing will be required over the next four quarters. Inotera accounts for the largest portion of this amount, at 32%. However, ProMOS likely faces the largest refinancing challenge, with more than US\$300m worth of convertible bonds due over the coming two quarters.

While consolidation is sorely needed, we worry it won't happen

Taiwan has too many DRAM makers, which are also too small. We believe that the government must foster industry consolidation at this critical juncture. While we were pleased to hear that the government's plans include efforts to improve R&D capabilities, such efforts mean little as long as Taiwan maintains five DRAM makers, which use technology from four different foreign partners. We believe the government must break from its past attitude and push for consolidation. Its new authority to extend debts could provide it with the necessary leverage, if it so chooses. Should Taiwan miss this opportunity to create a Hynix-like national DRAM champion, we suspect that it could face the dilemma of supporting unsustainable manufacturers again in the years ahead.

Thesis of modest recovery remains intact

We believe that the recent decline in utilization at a number of producers will yield decelerating supply growth both this quarter and the next. Thus, the DRAM industry remains on track for modest supply-demand improvement in 2009. Although we expect prices to bottom in 1Q09, we believe that 4Q08 could mark the bottom for both losses and sentiment.

Risk/reward profile appears positive

We value our DRAM universe based on historical mid cycle average multiples. Given the likelihood of bankruptcy protection in Taiwan, it appears that the worst case scenarios will be averted. We like Powerchip, Nanya Tech and Inotera. Downside risks to our thesis include further declines in consumer sentiment, an unexpectedly sharp cut in IT budgets, and a greater-than-expected netbook share.

Deutsche Bank AG/Hong Kong

All prices are those current at the end of the previous trading session unless otherwise indicated. Prices are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is sourced from Deutsche Bank and subject companies. Deutsche Bank does and seeks to do business with companies covered in its research reports. Thus, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. Independent, third-party research (IR) on certain companies covered by DBSI's research is available to customers of DBSI in the United States at no cost. Customers can access IR at <http://gm.db.com> or by calling 1-877-208-6300. DISCLOSURES AND ANALYST CERTIFICATIONS ARE LOCATED IN APPENDIX 1.

Deutsche Bank



Emerging Themes

Top picks

| | |
|--|-----|
| Nanya Technology Corp (2408.TW), TWD5.65 | Buy |
| Inotera Memories (3474.TW), TWD8.50 | Buy |

Companies featured

| Nanya Technology Corp (2408.TW), TWD5.65 | | Buy | |
|--|-------|-------|-------|
| | 2007A | 2008E | 2009E |
| P/E (x) | - | - | - |
| EV/EBITDA (x) | - | - | 30.2 |
| Price/book (x) | 1.3 | 0.7 | 1.8 |
| Inotera Memories (3474.TW), TWD8.50 | | Buy | |
| | 2007A | 2008E | 2009E |
| P/E (x) | 122.3 | - | - |
| EV/EBITDA (x) | 4.8 | 1.8 | 1.6 |
| Price/book (x) | 1.2 | 0.5 | 0.7 |
| Powerchip (5346.TWO), TWD3.81 | | Buy | |
| | 2007A | 2008E | 2009E |
| P/E (x) | - | - | - |
| EV/EBITDA (x) | 8.7 | - | 12.5 |
| Price/book (x) | 1.0 | 0.5 | 1.1 |
| ProMOS (5387.TWO), TWD2.04 | | Sell | |
| | 2007A | 2008E | 2009E |
| P/E (x) | - | - | - |
| EV/EBITDA (x) | 11.2 | - | 6.2 |
| Price/book (x) | 0.8 | 0.3 | 0.3 |

Committed to memory

Taiwan outlines a DRAM safety net

Taiwan's Ministry of Economic Affairs yesterday capped weeks of speculation by laying out a number of steps designed to help the country's financially challenged DRAM makers survive both the current downturn and the coincident global credit crunch. Although the details of the plan remain relatively vague, the announcement makes explicit what many felt was inevitable – that the Taiwan government would indeed follow Washington's lead in offering a rescue plan for the nation's most financially distressed industry. These efforts are broadly in line with our expectations, as well as what we have been hearing from government officials of late.

The most important component of the plan is a programme whereby the MoEA would grant six-month debt repayment extensions on a case-by-case basis. DRAM makers would have to apply to the MoEA more than 10 days before the forthcoming maturities and plead their case for the extensions. The mechanism for extending these maturities was not announced. However, there had been a number of suggestions recently that the government would use money from the National Development Fund.

The second component of the plan directly involves the equity markets. First, it sounds as if current short-sale restrictions will be extended beyond the currently-imposed period, which runs through the end of the year. Second, the MoEA suggested that government funds would be used to buy shares in the DRAM industry, as long as the fundamentals were solid.

A third, more opaque component of the MoEA's rescue plan is to boost the DRAM makers' R&D capabilities. Although details were scarce on what this might mean, it seemed encouraging, in that it suggests that the government is paying attention to some of the root causes of the current dilemma, rather than simply trying to address some of the symptoms. For all of Taiwan's efforts through the years to foster its tech sector, it has never approached the level of the strong coordinated assistance that was so important in the rise of both the Japanese and Korean semiconductor industries. The question is whether it is too late in the game for the more aggressive strategy of R&D coordination to be effective, given that DRAM technology is relatively mature and Taiwanese producers have relatively little of their own IP to offer by way of cross-licensing.

Consolidation sorely needed

While we are pleased to hear that government plans include efforts to improve R&D capabilities, such efforts mean little as long as Taiwan maintains five DRAM makers that use technology from four different foreign partners. The current crisis only serves to underscore how Taiwan has too many DRAM makers, and how these are too small to be viable in the longer term. As we argued at length in our recent industry launch report, virtually all of the technological trends in DRAM point to a greater threshold economy of scale. Thus, we believe that it is now critically important for the government to foster consolidation in the DRAM sector.

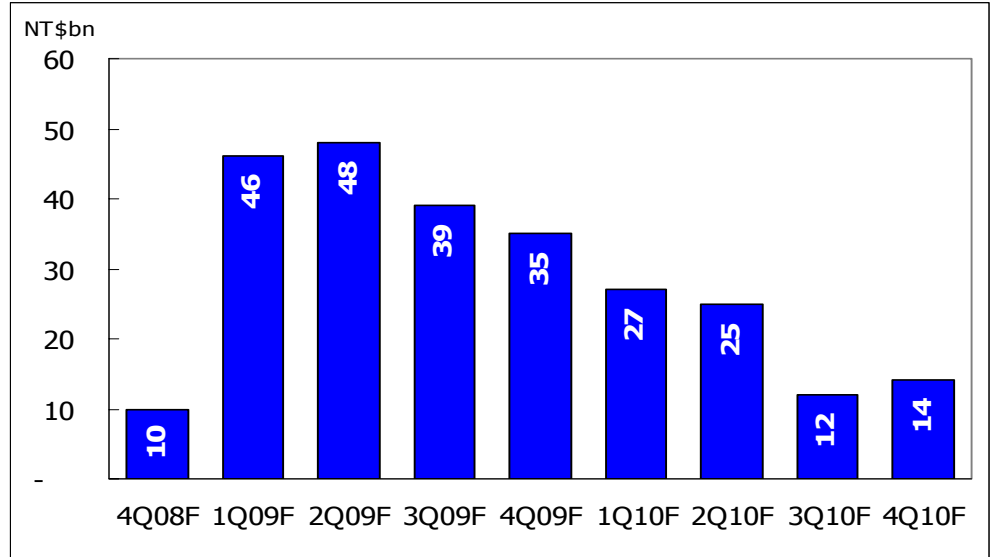
Unfortunately, this is easier said than done. A policy to press for consolidation would mean a break with a history of generally laissez-faire policies that the Taiwan government has pursued previously. The ruling Kuomintang party in particular has had little precedent for direct industrial intervention. However, the MoEA's new authority to extend debts could provide it with the necessary leverage, if it chooses to exercise it. By offering to act as the lender of last resort on a discretionary basis, the government could actually bring significant pressure to bear under the auspices of free market forces.

Should Taiwan miss this opportunity to foster the creation of a Hynix-like national DRAM champion, we fear it could face the dilemma of supporting unsustainable manufacturers again in the years ahead. Although consolidation is sorely needed, we see the chances of it occurring as less than likely. Perhaps the most encouraging thing we can say is that, with governments around the world nationalizing banks, the political cover to engage in extraordinary industrial policy is probably at an all-time high.

Refinancing dates loom

Refinancing requirements for the DRAM makers are set to surge in 1Q09, and move still higher in 2Q09. We estimate that debt refinancing requirements for the Taiwan DRAM sector will nearly quintuple in 1Q09, from this quarter's NT\$10bn to more than NT\$64bn. We forecast that a total of NT\$143bn in financing will be required over the next four quarters.

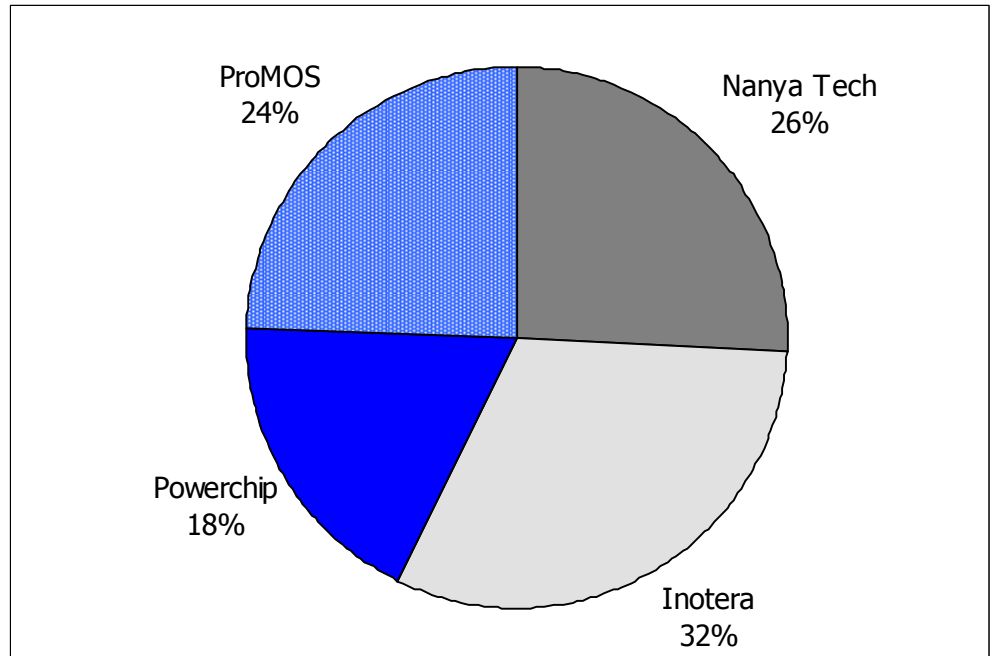
Figure 1: Fundraising requirements for Taiwan DRAM makers



Source: Deutsche Ban estimates

Inotera accounts for the largest portion of this amount, with 32% of the total.

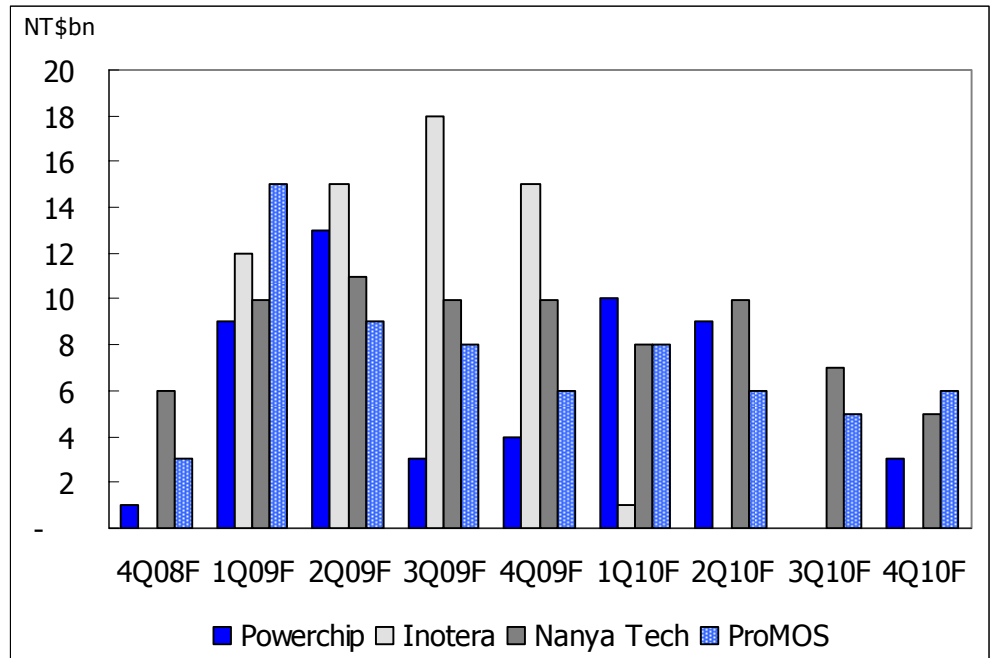
Figure 2: Fundraising requirements for Taiwan DRAM makers (next four quarters)



Source: Deutsche Bank estimates

However, ProMOS likely faces the largest refinancing challenge, with more than US\$300m worth of convertible bonds over the coming two quarters.

Figure 3: Fundraising requirements for Taiwan DRAM makers (through 2010)



Source: Deutsche Bank estimates

The detailed debt maturity schedules by company are provided in Appendix A, along with our estimates for the amount of new capital or debt extensions that we believe will be required.

Appendix A – Debt repayment schedules

Figure 4: Powerchip debt repayment schedule

| (NT\$m) | Total* | 4Q08F | 1Q09F | 2Q09F | 3Q09F | 4Q09F | 1Q10F | 2Q10F | 3Q10F | 4Q10F |
|------------------------------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|----------|--------------|
| ST borrowing | 12,786 | 3,197 | 3,197 | 3,197 | 3,197 | - | - | - | - | - |
| LT borrowing | 46,377 | 5,203 | 4,053 | 6,299 | 4,424 | 6,299 | 4,424 | 4,424 | 4,424 | 6,824 |
| Syndicated 1 | 725 | | 725 | | | | | | | |
| Syndicated 2 | 5,625 | 1,875 | | 1,875 | | 1,875 | | | | |
| Syndicated 3 | 9,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Syndicated 4 | 19,727 | 2,192 | 2,192 | 2,192 | 2,192 | 2,192 | 2,192 | 2,192 | 2,192 | 2,192 |
| Syndicated 5 | 7,677 | | | 1,097 | 1,097 | 1,097 | 1,097 | 1,097 | 1,097 | 1,097 |
| Syndicated 6 | 2,400 | | | | | | | | | 2,400 |
| Others | 1,223 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 |
| Bond repayment | 13,129 | - | - | 5,072 | - | - | 4,354 | 3,704 | - | - |
| ECB 5 | 5,072 | | | 5,072 | | | | | | |
| ECB 6 | 4,354 | | | | | | 4,354 | | | |
| ECB 7 | - | | | | | | | | | |
| CB 1 | 3,344 | | | | | | | 3,344 | | |
| CB 2 | 360 | | | | | | | 360 | | |
| Total repayment | 72,292 | 8,399 | 7,249 | 14,568 | 7,621 | 6,299 | 8,778 | 8,128 | 4,424 | 6,824 |
| Fundraising assumed (NT\$m) | 52,056 | 1,000 | 9,053 | 13,000 | 3,000 | 4,000 | 10,000 | 9,000 | - | 3,000 |

Source: Deutsche Bank estimates

Figure 5: ProMOS debt repayment schedule

| (NT\$m) | Total* | 4Q08F | 1Q09F | 2Q09F | 3Q09F | 4Q09F | 1Q10F | 2Q10F | 3Q10F | 4Q10F |
|------------------------------------|---------------|--------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|----------|
| ST borrowing | 5,212 | 1,303 | 1,303 | 1,303 | 1,303 | - | - | - | - | - |
| LT borrowing | 33,754 | 895 | 2,922 | 3,726 | 4,271 | 3,701 | 4,207 | 3,663 | 4,207 | 6,163 |
| Loan | 192 | 38 | 38 | 38 | 38 | 38 | | | | |
| Syndicated 1 | 5,000 | | 1,250 | | 1,250 | | 1,250 | | 1,250 | |
| Syndicated 2 | 6,656 | 831 | | 831 | | 831 | | 831 | | 3,331 |
| Syndicated 3 | 11,326 | | | 2,831 | | 2,831 | | 2,831 | | 2,831 |
| Syndicated 4 | 8,871 | | | | 2,957 | | 2,957 | | 2,957 | |
| Taiwan Life Insurance | 100 | 25 | 25 | 25 | 25 | | | | | |
| Kingston | 1,609 | | 1,609 | | | | | | | |
| Bond repayment | 9,853 | 1,053 | 8,801 | - | - | - | - | - | - | - |
| ECB 2 | 1,053 | 1,053 | | | | | | | | |
| ECB 4 | 8,801 | | 8,801 | | | | | | | |
| Total repayment | 48,819 | 3,250 | 13,025 | 5,029 | 5,574 | 3,701 | 4,207 | 3,663 | 4,207 | 6,163 |
| Fundraising assumed (NT\$m) | 60,000 | 3,000 | 15,000 | 9,000 | 8,000 | 6,000 | 8,000 | 6,000 | 5,000 | - |

Source: Deutsche Bank estimates

Figure 6: Nanya Tech debt repayment schedule

| (NT\$m) | Total* | 4Q08F | 1Q09F | 2Q09F | 3Q09F | 4Q09F | 1Q10F | 2Q10F | 3Q10F | 4Q10F |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------|--------------|--------------|
| ST borrowing | - | - | - | - | - | - | - | - | - | - |
| LT borrowing | 3,667 | - | - | - | - | - | - | - | 3,667 | - |
| Syndicated 1 | 3,667 | - | - | - | - | - | - | - | 3,667 | - |
| Syndicated 2 | - | - | - | - | - | - | - | - | - | - |
| Bond repayment | 34,892 | 10,000 | 482 | 2,500 | 2,700 | 6,180 | - | 4,150 | 2,700 | 6,180 |
| ECB | 482 | - | 482 | - | - | - | - | - | - | - |
| CB | 10,000 | 10,000 | - | - | - | - | - | - | - | - |
| Ordinary bond 96 1 | 1,650 | - | - | - | - | - | - | 1,650 | - | - |
| Ordinary bond 95 1 | 3,300 | - | - | - | - | 1,650 | - | - | - | 1,650 |
| Ordinary bond 95 2 | 3,960 | - | - | - | - | 1,980 | - | - | - | 1,980 |
| Ordinary bond 94 1 | 5,000 | - | - | 2,500 | - | - | - | 2,500 | - | - |
| Ordinary bond 94 2 | 5,400 | - | - | - | 2,700 | - | - | - | 2,700 | - |
| Ordinary bond 94 3 | 5,100 | - | - | - | - | 2,550 | - | - | - | 2,550 |
| Total repayment | 38,559 | 10,000 | 482 | 2,500 | 2,700 | 6,180 | - | 4,150 | 6,367 | 6,180 |
| Fundraising assumed (NT\$m) | 95,000 | 24,000 | 10,000 | 11,000 | 10,000 | 10,000 | 8,000 | 10,000 | 7,000 | 5,000 |

Source: Deutsche Bank estimates

Figure 7: Inotera debt repayment schedule

| (NT\$m) | Total* | 4Q08F | 1Q09F | 2Q09F | 3Q09F | 4Q09F | 1Q10F | 2Q10F | 3Q10F | 4Q10F |
|------------------------------------|---------------|------------|---------------|---------------|---------------|---------------|--------------|----------|----------|----------|
| ST borrowing | 3,790 | 947 | 947 | 947 | 947 | - | - | - | - | - |
| LT borrowing | 32,773 | 3,899 | 1,189 | 3,899 | 6,629 | 3,899 | 6,629 | - | 6,629 | - |
| Syndicated 1 | 1,189 | - | 1,189 | - | - | - | - | - | - | - |
| Syndicated 2 | 9,253 | 3,084 | - | 3,084 | - | 3,084 | - | - | - | - |
| Syndicated 3 | 2,443 | 814 | - | 814 | - | 814 | - | - | - | - |
| Syndicated 4 | 13,473 | - | - | - | 4,491 | - | 4,491 | - | 4,491 | - |
| Syndicated 5 | 6,414 | - | - | - | 2,138 | - | 2,138 | - | 2,138 | - |
| Bond repayment | 3,960 | - | - | - | - | 1,980 | - | - | - | 1,980 |
| Ordinary bond 95 1 | 3,960 | - | - | - | - | 1,980 | - | - | - | 1,980 |
| Total repayment | 40,522 | 4,846 | 2,136 | 4,846 | 7,577 | 5,879 | 6,629 | - | 6,629 | 1,980 |
| Fundraising assumed (NT\$m) | 63,000 | (0) | 12,000 | 15,000 | 18,000 | 15,000 | 3,000 | - | 0 | - |

Source: Deutsche Bank estimates

Appendix 1

Important Disclosures

Additional information available upon request

| Disclosure checklist | | | |
|-----------------------|----------|----------------------|------------|
| Company | Ticker | Recent price* | Disclosure |
| Powerchip | 5346.TWO | 3.81 (TWD) 10 Nov 08 | 6,8,14 |
| Nanya Technology Corp | 2408.TW | 5.65 (TWD) 10 Nov 08 | NA |
| Inotera Memories | 3474.TW | 8.30 (TWD) 7 Nov 08 | NA |
| ProMOS | 5387.TWO | 2.04 (TWD) 10 Nov 08 | 6 |

*Prices are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is sourced from Deutsche Bank and subject companies.

Important Disclosures Required by U.S. Regulators

Disclosures marked with an asterisk may also be required by at least one jurisdiction in addition to the United States. See "Important Disclosures Required by Non-US Regulators" and Explanatory Notes.

6. Deutsche Bank and/or its affiliate(s) owns one percent or more of any class of common equity securities of this company calculated under computational methods required by US law.
8. Deutsche Bank and/or its affiliate(s) expects to receive, or intends to seek, compensation for investment banking services from this company in the next three months.
14. Deutsche Bank and/or its affiliate(s) has received non-investment banking related compensation from this company within the past year.

Important Disclosures Required by Non-U.S. Regulators

Please also refer to disclosures in the "Important Disclosures Required by US Regulators" and the Explanatory Notes.

6. Deutsche Bank and/or its affiliate(s) owns one percent or more of any class of common equity securities of this company calculated under computational methods required by US law.

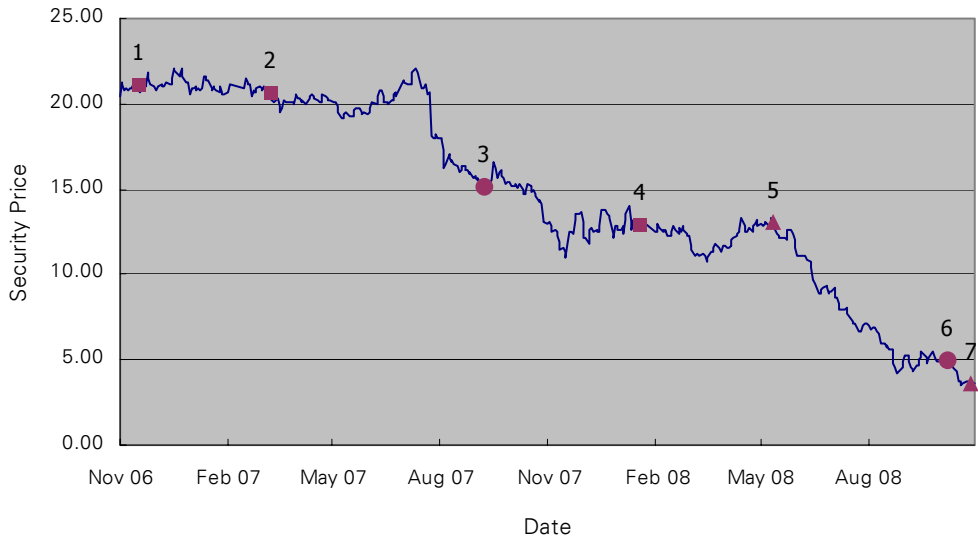
For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at <http://gm.db.com>.

Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst about the subject issuers and the securities of those issuers. In addition, the undersigned lead analyst has not and will not receive any compensation for providing a specific recommendation or view in this report. Matt Cleary

Historical recommendations and target price: Powerchip (5346.TWO)

(as of 11/10/2008)



Previous Recommendations

- Strong Buy
- Buy
- Market Perform
- Underperform
- Not Rated
- Suspended Rating

Current Recommendations

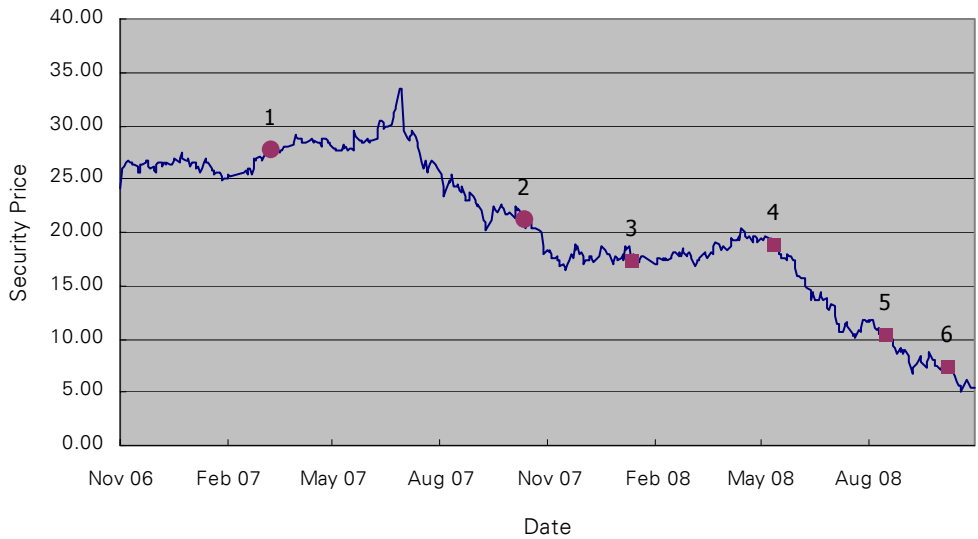
- Buy
- Hold
- Sell
- Not Rated
- Suspended Rating

*New Recommendation Structure as of September 9, 2002

| | | | | | |
|----|-------------|---|----|-------------|--|
| 1. | 27/11/2006: | Buy, Target Price Change TWD30.00 | 5. | 22/5/2008: | Upgrade to Buy, Target Price Change TWD15.00 |
| 2. | 20/3/2007: | Buy, Target Price Change TWD27.00 | 6. | 17/10/2008: | Downgrade to Hold, Target Price Change TWD5.22 |
| 3. | 18/9/2007: | Downgrade to Hold, Target Price Change TWD17.00 | 7. | 7/11/2008: | Upgrade to Buy, Target Price Change TWD5.64 |
| 4. | 30/1/2008: | Hold, Target Price Change TWD12.00 | | | |

Historical recommendations and target price: Nanya Technology Corp (2408.TW)

(as of 11/10/2008)



Previous Recommendations

- Strong Buy
- Buy
- Market Perform
- Underperform
- Not Rated
- Suspended Rating

Current Recommendations

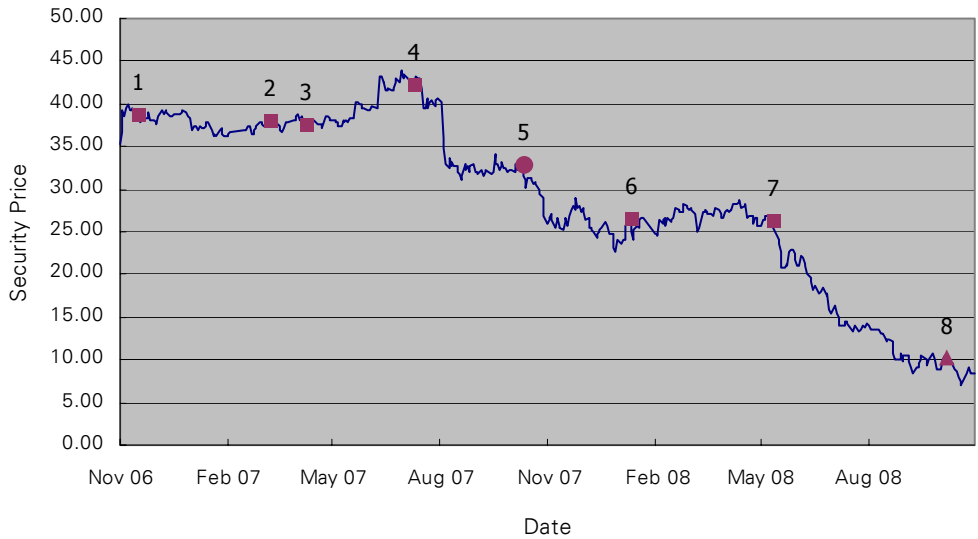
- Buy
- Hold
- Sell
- Not Rated
- Suspended Rating

*New Recommendation Structure as of September 9, 2002

| | | | | | |
|----|-------------|---|----|-------------|--|
| 1. | 20/3/2007: | Downgrade to Hold, Target Price Change TWD25.00 | 4. | 22/5/2008: | Sell, Target Price Change TWD12.10 |
| 2. | 22/10/2007: | Downgrade to Sell, Target Price Change TWD13.80 | 5. | 26/8/2008: | No Recommendation, Target Price Change TWD0.00 |
| 3. | 22/1/2008: | Sell, Target Price Change TWD9.10 | 6. | 17/10/2008: | Buy, Target Price Change TWD9.73 |

Historical recommendations and target price: Inotera Memories (3474.TW)

(as of 11/10/2008)



Previous Recommendations

- Strong Buy
- Buy
- Market Perform
- Underperform
- Not Rated
- Suspended Rating

Current Recommendations

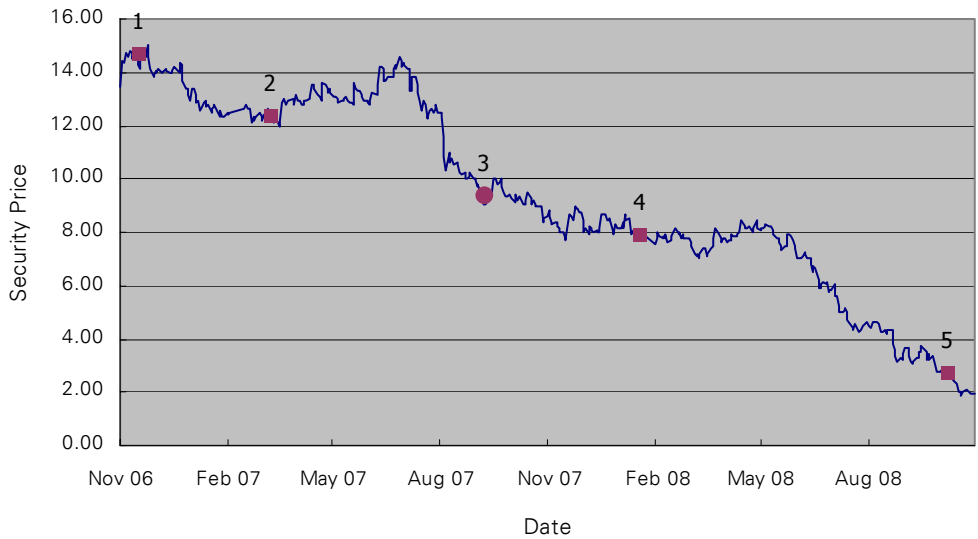
- Buy
- Hold
- Sell
- Not Rated
- Suspended Rating

*New Recommendation Structure as of September 9, 2002

| | | | | | |
|----|-------------|-----------------------------------|----|-------------|---|
| 1. | 27/11/2006: | Buy, Target Price Change TWD45.00 | 5. | 22/10/2007: | Downgrade to Hold, Target Price Change TWD31.00 |
| 2. | 20/3/2007: | Buy, Target Price Change TWD44.00 | 6. | 22/1/2008: | Hold, Target Price Change TWD23.30 |
| 3. | 20/4/2007: | Buy, Target Price Change TWD42.00 | 7. | 22/5/2008: | Hold, Target Price Change TWD24.10 |
| 4. | 21/7/2007: | Buy, Target Price Change TWD46.00 | 8. | 17/10/2008: | Upgrade to Buy, Target Price Change TWD12.50 |

Historical recommendations and target price: ProMOS (5387.TWO)

(as of 11/10/2008)



Previous Recommendations

- Strong Buy
- Buy
- Market Perform
- Underperform
- Not Rated
- Suspended Rating

Current Recommendations

- Buy
- Hold
- Sell
- Not Rated
- Suspended Rating

*New Recommendation Structure as of September 9, 2002

| | | | | | |
|----|-------------|--|----|-------------|-----------------------------------|
| 1. | 27/11/2006: | Buy, Target Price Change TWD18.00 | 4. | 29/1/2008: | Sell, Target Price Change TWD6.90 |
| 2. | 20/3/2007: | Buy, Target Price Change TWD15.50 | 5. | 17/10/2008: | Sell, Target Price Change TWD2.33 |
| 3. | 18/9/2007: | Downgrade to Sell, Target Price Change TWD8.00 | | | |

Equity rating key

Equity rating dispersion and banking relationships

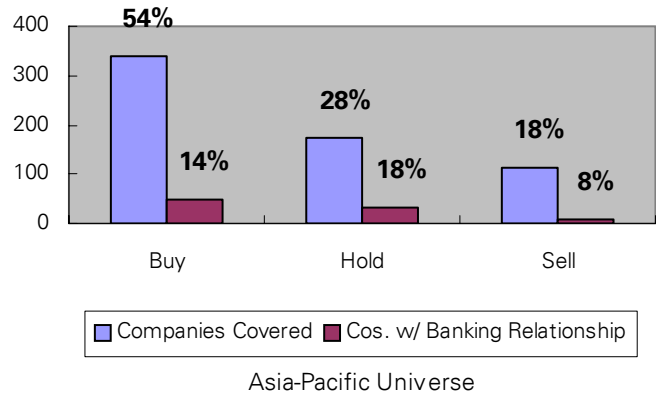
Buy: Based on a current 12- month view of total shareholder return (TSR = percentage change in share price from current price to projected target price plus projected dividend yield) , we recommend that investors buy the stock.

Sell: Based on a current 12-month view of total shareholder return, we recommend that investors sell the stock

Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

Notes:

1. Newly issued research recommendations and target prices always supersede previously published research.
2. Ratings definitions prior to 27 January, 2007 were:
 - Buy: Expected total return (including dividends) of 10% or more over a 12-month period
 - Hold: Expected total return (including dividends) between -10% and 10% over a 12-month period
 - Sell: Expected total return (including dividends) of -10% or worse over a 12-month period



Regulatory Disclosures

1. Important Additional Conflict Disclosures

Aside from within this report, important conflict disclosures can also be found at <https://gm.db.com/equities> under the "Disclosures Lookup" and "Legal" tabs. Investors are strongly encouraged to review this information before investing.

2. Short-Term Trade Ideas

Deutsche Bank equity research analysts sometimes have shorter-term trade ideas (known as SOLAR ideas) that are consistent or inconsistent with Deutsche Bank's existing longer term ratings. These trade ideas can be found at the SOLAR link at <http://gm.db.com>.

3. Country-Specific Disclosures

Australia: This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act.

EU countries: Disclosures relating to our obligations under MiFiD can be found at <http://globalmarkets.db.com/riskdisclosures>.

Japan: Disclosures under the Financial Instruments and Exchange Law: Company name - Deutsche Securities Inc. Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, The Financial Futures Association of Japan. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations.

New Zealand: This research is not intended for, and should not be given to, "members of the public" within the meaning of the New Zealand Securities Market Act 1988.

Russia: This information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

Deutsche Bank AG/Hong Kong**Asia-Pacific locations****Deutsche Bank AG**

Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG

Level 55
Cheung Kong Center
2 Queen's Road Central
Hong Kong
tel: (852) 2203 8888

Deutsche Equities India Pte Ltd

DB House, Ground Floor
Hazarimal Somani Marg
Fort, Mumbai 400 001
India
Tel: (91) 22 5658 4600

Deutsche Securities Inc.

2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6701

Deutsche Bank (Malaysia) Berhad

Level 18-20
Menara IMC
8 Jalan Sultan Ismail
Kuala Lumpur 50250
Malaysia
Tel: (60) 3 2053 6760

In association with
Deutsche Regis Partners, Inc.

Level 23, Tower One
Ayala Triangle, Ayala Avenue
Makati City, Philippines
Tel: (63) 2 894 6600

Deutsche Securities Korea Co.

17th Floor, YoungPoong Bldg.,
33 SeoRin-Dong,
Chongro-Ku, Seoul (110-752)
Republic of Korea
Tel: (82) 2 316 8888

Deutsche Bank AG Singapore

One Raffles Quay
South Tower
Singapore 048583
Tel: (65) 6423 8001

Deutsche Securities Asia Ltd

Taiwan Branch
Level 6
296 Jen-Ai Road, Sec 4
Taipei 106
Taiwan
Tel: (886) 2 2192 2888

In association with
TISCO Securities Co., Ltd

TISCO Tower
48/8 North Sathorn Road
Bangkok 10500
Thailand
Tel: (66) 2 633 6470

In association with
PT Deutsche Verdhana Indonesia

Deutsche Bank Building,
6th Floor, Jl. Imam Bonjol No.80,
Central Jakarta,
Indonesia
Tel: (62 21) 318 9541

International locations**Deutsche Bank Securities Inc.**

60 Wall Street
New York, NY 10005
United States of America
Tel: (1) 212 250 2500

Deutsche Bank AG London

1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank AG

Große Gallusstraße 10-14
60272 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG

Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG

Level 55
Cheung Kong Center
2 Queen's Road Central
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.

2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6701

Global Disclaimer

The information and opinions in this report were prepared by Deutsche Bank AG or one of its affiliates (collectively 'Deutsche Bank'). The information herein is believed to be reliable and has been obtained from public sources believed to be reliable. Deutsche Bank makes no representation as to the accuracy or completeness of such information.

Deutsche Bank may (1) engage in securities transactions in a manner inconsistent with this research report, (2) with respect to securities covered by this report, sell to or buy from customers on a principal basis, and (3) consider this report in deciding to trade on a proprietary basis.

Opinions, estimates and projections in this report constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinions of Deutsche Bank and are subject to change without notice. Deutsche Bank has no obligation to update, modify or amend this report or to otherwise notify a recipient thereof in the event that any opinion, forecast or estimate set forth herein, changes or subsequently becomes inaccurate. Prices and availability of financial instruments are subject to change without notice. This report is provided for informational purposes only. It is not an offer or a solicitation of an offer to buy or sell any financial instruments or to participate in any particular trading strategy.

The financial instruments discussed in this report may not be suitable for all investors and investors must make their own informed investment decisions. Stock transactions can lead to losses as a result of price fluctuations and other factors. If a financial instrument is denominated in a currency other than an investor's currency, a change in exchange rates may adversely affect the investment. Past performance is not necessarily indicative of future results.

Unless governing law provides otherwise, all transactions should be executed through the Deutsche Bank entity in the investor's home jurisdiction. In the U.S. this report is approved and/or distributed by Deutsche Bank Securities Inc., a member of the NYSE, the NASD, NFA and SIPC. In Germany this report is approved and/or communicated by Deutsche Bank AG Frankfurt authorized by the BaFin. In the United Kingdom this report is approved and/or communicated by Deutsche Bank AG London, a member of the London Stock Exchange and regulated by the Financial Services Authority for the conduct of investment business in the UK and authorized by the BaFin. This report is distributed in Hong Kong by Deutsche Bank AG, Hong Kong Branch, in Korea by Deutsche Securities Korea Co. and in Singapore by Deutsche Bank AG, Singapore Branch. In Japan this report is approved and/or distributed by Deutsche Securities Inc. The information contained in this report does not constitute the provision of investment advice. In Australia, retail clients should obtain a copy of a Product Disclosure Statement (PDS) relating to any financial product referred to in this report and consider the PDS before making any decision about whether to acquire the product. Deutsche Bank AG Johannesburg is incorporated in the Federal Republic of Germany (Branch Register Number in South Africa: 1998/003298/10). Additional information relative to securities, other financial products or issuers discussed in this report is available upon request. This report may not be reproduced, distributed or published by any person for any purpose without Deutsche Bank's prior written consent. Please cite source when quoting.