

THE
CITO BULLETIN

2003 – I

Report #1

CENTRED ON CITO

TAIWAN IN FOCUS

SARS

CITO OPENING

TELECOM IN ASIA

June 2003



Letter from the Editor

It is with pride I write the introduction to this, the first official CITO report. This bulletin is the result of increased Chalmers presence in Asia. It started off as an idea for Chalmers continued strategic development and many hours have since been put into the project. An important contribution is the effort made by seven fulltime Chalmers students. Their work made it possible to open the Chalmers International Taiwan Office, CITO, which is the first international Chalmers office.

The creation of the physical environment as well as work routines for the staff were completed in a little less than six weeks. The opening ceremony of March the 27th was therefore a success and hopefully marks the commencement of long lasting and rewarding cooperation between Chalmers and the National Chiao Tung University, NCTU, Hsinchu.

The international Chalmers office will provide and facilitate the exchange of students, knowledge and staff between the two universities and will at the same time work for giving Chalmers students the possibility to have some part of their practical training with companies in Taiwan. The staff working in Taiwan will also produce reports, like this one, in order to increase the awareness and knowledge of Southeast Asia among staff and students at Chalmers.

The CITO reports will bring information on the current development in the Southeast Asian region and on the continuing work with the CITO office. The goal is to provide a comprehensive overview that will spot new and emerging regional trends in technology, economy and politics.

However, the aim for the future is to change the format of the CITO reports into a more legible form, i.e. with a more elaborate layout and design. This will hopefully increase the accessibility to the information gathered in Taiwan.

This first issue of the CITO Bulletin is naturally concerned with the opening of CITO and describes the purpose and goals of the office. It also includes a conference report from a telecom seminar in South-Korea and a sensitivity analysis of SARS' impact on the economy in Southeast Asia. Additionally, basic information about Taiwan is provided.

Challenges have not been absent when working with the office. Who could for example have foreseen the implications of an old donation for the choice of office furniture and the impact on the society of an epidemic virus disease? Moreover, we learnt the importance of preserving face with the persons we met, the intricacy of the Chinese culture. Along the way we have also made new friends and enjoyed the hospitality of the Taiwanese people.

The will, among those we have worked with, to overcome cultural obstacles and to understand the unknown has been more powerful than the difficulties these obstacles might have imposed. The experience I have had of Taiwan and the Chinese cultural heritage is therefore most positive and I encourage everyone to visit Taiwan and China.

With this report the students who have worked with CITO during this academic year pass the torch on to the next group who will start working this autumn. We can only wish them luck and hope that they will have an as interesting and rewarding stay as we have had.

CITO – Chalmers Knowledge in Asia

Christofer Salsing
Editor-in-Chief

Contents

Centred on CITO – Opening Ceremony, p. 2

CITO – The Organisation and the Goals, p. 4

Taiwan in Focus – A Brief Description of the Country and the People, p. 5

SARS – Economic Impact on the Region, p. 9

Conference Report –Telecom in Asia, p. 13

CITO BULLETIN

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Chalmers International Taiwan Office Spring 2003 and Mrs. Huang.
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Centred on CITO – Opening Ceremony

On March 27th 2003, Chalmers opened Chalmers International Taiwan Office (CITO) in Hsinchu, Taiwan. The opening of this first international Chalmers office is a milestone in Chalmers recognition of the importance of the development in the Southeast Asia region. The location of the office in Taiwan, is a choice by Chalmers in order to benefit from being at National Chiao Tung University (NCTU), one of the top technical universities in Taiwan.

The CITO office has been set up in less than six weeks by seven full time students from Chalmers, studying at NCTU as a part a bilateral exchange program. Through hard work and motivated by a will to start an office in a foreign environment, the CITO staff made all necessary arrangements to make sure the office could be opened to public on March 27th.



The opening ceremony started with a formal introduction of the bilateral exchange and purpose of CITO. Guests and participants were invited to listen to an introduction of CITO, Chalmers and Sweden, and guests of honour including Jan-Erik Sundgren, Chalmers Principal, Chun-Yen Chang, NCTU's Principal, Junq-Tzer Lin, Mayor of Hsinchu, Henrik Byström, Official Representative of the Swedish Trade Council, Ragnar Kihlberg

Director General of Corporate Relations Chalmers, and Randy Yen, Deputy Director General of Hsinchu Science Based Industrial Park, gave inauguration speeches and talked about the importance of Chalmers presence and the opportunity that this provides for the universities.

At the time of the opening ceremony, the war in Iraq had just broken out and people were becoming aware of the new widely spread SARS-virus. The fact that Jan-Erik Sundgren and Ragnar Kihlberg, despite of those threatening clouds, came to Taiwan showed the NCTU administration and the CITO staff the importance that Chalmers attaches to this new office.

The importance of this event was noticeable and in addition to specially invited guests, more than 150 interested students and university staff attended the opening ceremony. Since



Chalmers is the first foreign university to open an office at NCTU, it drew much attention from national media. The Opening Ceremony experienced good exposure and the event was covered in both newspapers and on national TV.

After finishing the speeches in the conference hall, the time had come to inaugurate the office. The CITO door sign was uncovered and the entrance ribbon to the office was cut by Chalmers' and NCTU's

Principals. During a duo trumpet fanfare guests entered the office to view CITO's exhibition of Chalmers and Sweden, but also see what CITO could offer for NCTU students and companies in Taiwan.

The CITO exhibition contains traditional Swedish objects, posters and books about Sweden, general information about Chalmers and information about the exchange programs between Chalmers and NCTU. For the opening ceremony, special movies and slideshows

about Chalmers, CITO and Sweden, had been arranged to provide the guests with a full picture of Chalmers and Sweden.



In the afternoon a campus tour and a visit to the Hsinchu Science Based Industrial Park were arranged for the Chalmers and CITO staff. NCTU's Vice President Wen-Hsiang Tsai guided Jan-Eric Sundgren, Ragnar Kihlberg and CITO staff around some of the most well-known places in the NCTU campus. The visited places included NCTU's Gallery, Library and Microelectronics and Information Systems Research Center.

The opening ceremony ended with a delicious Taiwanese dinner at the Ambassador Hotel, where invited guests, CITO staff and NCTU students participated. It was a very successful day, and both NCTU and Chalmers believe that a foundation for fruitful cooperation between Chalmers and NCTU has been laid out and will continue to grow in the coming future.

Fredrik C A Jönsson
Emma Lantell

Chalmers International Taiwan Office

Chalmers International Taiwan Office – CITO is the result of a bilateral exchange agreement between National Chiao Tung University and Chalmers University of Technology. CITO is strategically located at the campus of National Chiao Tung University next to Hsinchu Science-based Industrial Park 70 km southwest of Taipei.

The office is run through the active involvement of formally assigned exchange students from Chalmers. By this established presence in the region there is unique opportunity to enhance the contacts at all levels between Chalmers and the Southeast Asian region, in particularly Taiwan. The office will support the exchange of staff and students between the two universities as well as analysing the technological and economical development with focus on the scientific sphere and emerging technologies, here there will be regularly reports from CITO.

During this past semester at CITO we have been able to see great future possibilities for the office, both within National Chiao Tung University and the greater region. The office offers excellent facilities for organizing seminars and exhibitions. It creates the environment for informal meetings between staff and students as well as visitors from outside the university. As the office develops it will also be a good base for taking on the bigger Southeast Asia region.

After the recent opening of the office most work has evolved around creating knowledge of the organisation's existence, in Sweden as well as in Taiwan. But there is no lack of future challenges and opportunities for the office.

One of the goals is to create good contacts with companies in the region and to support their recruitment of engineers interested in working in Asia. Against this background the work at CITO is very rewarding since it creates an insight and cultural understanding that a normal student exchange program could not have generated, mainly through an inevitable contact-net with great diversity.

As for Chalmers, anyone interested in Southeast Asia with regards to academic activity, companies or technology should be more than welcome to make use of CITO and its growing contact net in the region. Taiwan is currently going through major structural changes were a large amounts of money are invested in education and R&D, especially in electronics and computer science, so there is a good chance of finding common interests within these fields.

Niclas Brogren

Taiwan in Focus

Facts

Full country name:	Taiwan Republic of China
Population:	22, 5 million. Taiwanese (84%), Aboriginal (2%), Chinese (14%)
Area:	36 188 km ²
Language:	Taiwanese, Mandarin Chinese
Capital city:	Taipei
Religion:	Buddhism, Taoism, Confucianism, Christianity
Currency:	New Taiwan Dollar (NTD)
President:	Chen Shui-bian
Government:	Democratic Progressive party
Largest parties:	Democratic Progressive Party 36.57% (December 2001) Kuomintang 31.28% People First Party 20.34% Taiwan Solidarity Union 8.50% The New Party 2.86%
Exchange rate:	1 NTD=0, 25 SEK
GNP/capita:	USD 12 876 (2001)
GNP-growth:	3,27% (2002)
Inflation:	-0, 20 % (2002)
Foreign exchange reserve:	USD 164,84 billion (Jan 2003)
Trade balance:	USD 18,05 billion (2002)
Unemployment:	5,17% (2002)

History

There is not much known of Taiwan's early history but it is estimated that pacific islanders may have lived here for about 10,000 years with the migration from China beginning in the 15th century. The first Europeans to arrive were the Portuguese in 1517 and they named the island Illa Formosa – The beautiful island. In 1624 the Dutch came around and invaded the Island, but it only lasted for two years before the Spanish kicked them out. The Spanish held the island until 1641 when the Dutch returned and recaptured the island. During 1660s the Ming and Manchu dynasties arrived to the island, they threw the Dutch out and fought each other for control of the island. The Manchu's eventually won the battle and made Taiwan part of the Fujian province and started a flood of Chinese immigrants to Taiwan.

Taiwan was easily taken from China by the Japanese in 1895 when the Japanese started their "European style" colonialism. The island was held until the end of World War II when it was given back to China via the Americans, some of the Japanese influence can still be seen in Taiwan. In 1949 China's President Chiang Kaishek and the nationalist party Kuomintang (KMT) fled to Taiwan escaping the communists that were taking control of the mainland. When escaping to Taiwan they brought with them 1.5 million Chinese and a lot of the finest national treasures from Taiwan, where they were planning on reconquering the mainland.

Both the leaders of communist china (People's Republic of China) and Taiwan (Republic of China) claim to be the voice of all China. Today most countries have acknowledged mainland China as the true China. This since Kuomintang lost the Chinese United Nation set in 1971 and USA withdraw its recognition of Republic of China 1979.

Politics

Chiang Kaishek remained president until his death in 1975 and in 1978 his son Chiang Ching-kuo became president. The Taiwanese started to see a dynasty pattern and criticism of the one party system rose leading to that Chiang Ching-kuo in 1986 appointed a commission which recommended the lifting of martial law and legalization of political parties. Six of the previously "illegal" parties filed for official status and the electoral reforms led in 1986 to the first multiparty election. Chiang Ching-kuo died in 1988 and the vice president Lee Teng-hui became Taiwan's first native born president.

Taiwanese politics is divided amongst those who want reunification with China (the Kuomintang line) and those who want Taiwanese independence or the status quo preserved. In 1995 the relations between the two Chinas, always chilly, plummeted to a new low when Lee Teng-hui made a high-profile visit to the USA before the upcoming election. This provoked China who held intense military exercises near the Taiwanese coast and tested ballistic missiles which made it plain that China could deliver nuclear warheads anywhere on Taiwan if they chose. In response, the United States sent a couple of warships to monitor the situation. Despite the region's tensed situation, the presidential election was held without incident, and Lee Teng-hui was returned to office. The next upset came in March 2000 when Taiwan's next president Chen Shui-bian was elected. He's the candidate of Democratic Progressive Party, who believes in a formal declaration of independence for the island. This ended 55 years of nationalist rule and upset the Chinese who regards Taiwan as a rebel province.

Today Sweden's relations with Taiwan are, as for the rest of EU, guided by the "One China policy" where there is an acknowledgement of the Peoples Republic of China and not the Republic of China (Taiwan). Consequently, Sweden has no official political relations with Taiwan. In Taiwan Sweden is represented by the Swedish trade council with an office in Taipei, in Sweden Taiwan is represented by Taipei mission in Stockholm.

Economy

The country has a strong macroeconomic situation with a large surplus in their trade balance, large foreign exchange reserve and small national dept. However, Taiwan is currently undergoing some major structural changes where knowledge intensive areas and markets grow while less knowledge intensive areas suffer; this leads to a structural unemployment creating a need for changes in the finance sector. There is also a growing budget deficit and a need to overlook the bank sector.

The Taiwanese economy is very dependent on export and therefore sensitive to the global business climate. Taiwan has for the last 30 years had a phenomenal growth with a GNP averaging 6-7 % but in 2001 the country experienced a negative growth for the first time since the Japanese left in 1949. The reason was the global business downturn where manufacturers of IT related products such as semiconductors, notebooks and electronic was amongst the losers. Today the Taiwanese economy has recovered to a GNP around 3% and it is mainly due to an increased export of IT related goods to China. Against the background of earlier growth 3% seems little to many Taiwanese economists but compared to other developed economies it is not bad.

Trade

1st of January 2002 Taiwan joined the WTO, only a day after China, and it has led to an opening in the trade restrictions between the two countries. However, Taiwan has a long history of import substitution and there are still many obligations to fulfil to meet the demands from WTO, especially with regards to Taiwanese import from China. The most significant difference for Taiwan is that investment limitations for Taiwanese companies active in China have been removed.

Taiwan's biggest trading partners are USA, China and Japan. The last couple of years the Chinese market has grown rapidly for the Taiwanese industry. It is a combination of investment goods for production such as machinery, where Taiwan is strong, and the fast growing Chinese IT related industry. Around 75% of the Chinese IT industry is owned by Taiwanese and it is no surprise that old business contacts are kept alive and a lot of components and related products are imported from Taiwan.

Sweden's trade with Taiwan is large compared to that with other Southeast Asian countries. The export includes telecom, vehicles, machinery, steel, medical equipment, medicine, paper and pulp. About forty Swedish companies operate in Taiwan while many more act through agents and distributors. About ten Taiwanese companies have established a presence in Sweden.

Technology

Taiwan is currently going through big structural changes where the traditional manufacturing industry is suffering from competition, especially from China. The heavy industry is becoming more efficient and capital-intensive, the productivity increase and the amount of employees decrease. Instead knowledge intensive sectors are growing rapidly. The government is seemingly very pragmatic when striving to climb the value-chain and the investments in R&D are comprehensive, estimated to 3 % of BNP. A visible effect of these investments is gigantic science parks that create clusters of knowledge intensive companies around Taiwan, the biggest located in Hsinchu southwest of Taipei.

One of the biggest issues in Taiwan at the moment is how competitive they are against the mainland. Today the IT related, chemical and mechanic industries are very competitive, even world class, but a lot of the manufacturing is rapidly moving across the strait. While this is taking place the Taiwanese are focusing on keeping the ownership, management and R&D in Taiwan. How this works out depends on Taiwan's ability to handle the structural changes involved and whether they manage to nurse today's technological lead towards China. In Taiwan as well as in the rest of the world everyone agrees that the integration with China is an important factor for how Taiwan will handle the next step up the value-chain into becoming a true knowledge economy. However, it's less recognized how dependent Taiwan will be on other technology leaders, mainly USA but also Japan and Europe. The Taiwanese wonder during the 80s and 90s, when Taiwan became a world leader in manufacturing of electronic components such as semiconductors, were largely the work of entrepreneurs, engineers and scientists that had worked in USA and Silicon Valley. This new phase into the knowledge sector seems to carry a wish for a bigger independency and Taiwan is investing big in fields such as; nanotechnology, optoelectronics, biotechnology. How well spent these money are and how Taiwan manage to handle structural changes are, together with the business threat from China, key questions for the future.

Culture

Traditional Taiwanese culture is very similar to that of mainland China and Taiwan can be a cultural minefield for the uninformed visitor. As in China, 'face' is vital, and destroying

someone's face is surprisingly easy to do. In order to save the face of others, the Taiwanese rarely express their emotions or speak frankly: smiles and politeness all-round are the norm. Gift-giving - especially when the gift is prestigious - flattery, self-deprecation and flowery rhetoric are an everyday part of Taiwanese interaction. As well as saving face, this rigmarole creates *guanxi*, a relationship of two-way obligations which allows participants to ask the most outrageous favors of one another.

Taiwanese take health and longevity very seriously. Superstitious about death, the Taiwanese avoid its symbols - white and the number four - and never talk about dying or accidents. Despite this, people do die, and when they do the tip-toeing attitude goes out the window. Taiwanese funerals are reminiscent of a Saoshing-soaked night in a karaoke bar.

Niclas Brogren

SARS – Impact on the Economic Climate in Southeast Asia

The outbreak of Severe Acute Respiratory Syndrome (SARS) has affected the short-term prospects of growth in Asia. As of June 24, the World Health Organisation statistics show a cumulative total of 8458 probable SARS cases and 807 deaths reported from 32 countries. The spread of the disease has led to a mounting concern worldwide and put a number of East and Southeast Asian countries under considerable strain. The epidemic has had the most impact on China, Hong Kong, Taiwan, Singapore and Viet Nam but it has also affected other economies although to a lesser extent.

However, positive developments and improved public health measures in the recent weeks have suggested that SARS, although serious will only cause a temporary shock to economic growth. Implications of the epidemic though, will extend beyond this short period.

The main effect of SARS is the reduction of demand which affects overall economic growth. This reduction in demand is primarily due to a significant reduction in private consumption spending caused by the uncertainty and fear generated by the disease. Services involving face-to-face contact have been dealt a severe blow by the fear of increased risk of infection by such interactions. Especially the service export businesses as tourism and transportation (particularly airlines) as well as retailing have been severely affected when consumers have become more and more reluctant to visit shops, restaurants and entertainment events as well as attending business fairs and conferences; travellers cancelling their trips.

Tourism accounts for over 9% of GDP in East Asia and about 11% in Southeast Asia. As the visitor arrivals drop the hotel occupancy decreases and contributes to put strain on the industry.

Investments are affected by the aggregated demand and increased risk and heightened uncertainties can lead to an imbalance; excess capacity is likely to emerge and increase. The same goes for the foreign direct investment inflow which may be delayed or reduced in reaction to SARS.

However, on factor that might offset this negative impact is the rebound of private spending when the epidemic is brought under control. Consumer may compensate for the earlier reduction by increasing consumption. While domestic consumption hence quickly could change it might take longer for foreign travellers and investors to return.

Different (Macroeconomic) Scenarios

The impact of SARS ultimately depends on the seriousness of the disease, the duration of the epidemic and the structure of the economy; especially the importance of the service industries in GDP.

Referring to two scenarios developed by the Asian Development Bank (ADB) the recent development of the disease and the containment measures brought into place in the affected economies suggests that the most intensive impact will be confined to two months. There are however many uncertainties remaining and therefore the need for two scenarios. The first scenario assumes that SARS will have a serious impact in the second quarter of 2003 and the second assumes that the impact will be during both the second and third quarter of the due year.

An underlying assumption in the calculation made by the ADB is that the decrease in demand initially will be due to a reduction of demand in the service sector. This reduction in the service sector growth causes in turn a reduction in the consumption expenditures.

The results show that the GDP growth in the East and Southeast Asian economies is likely to be reduced by approximately 0.2 – 1.8 percentage points in 2003 if the disease

persists for a quarter in individual economies. If the epidemic is more persistent and extends into the third quarter the impact would also become more severe; a decrease in GDP growth of 0.5 – 4.0 percentage points.

The decreased demand will put deflationary pressures on the some economies including China, Hong Kong and Taiwan. Weakened demand would also cause the unemployment to rise. Moreover, although reduced service exports decrease foreign capital inflow, imports may be lowered even more due to the collapsing domestic demand. This means that the trade balance most likely would not suffer.

Macroeconomic Impact on Taiwan

The possible effects of SARS on the Taiwanese economy are mainly coming from three areas: weakened retail consumption in China and Taiwan, production disruptions and delays in new product launches. Although so far, the number of reported SARS cases in Taiwan is relatively limited, the country is not likely to be immune to a potential economic impact since China is the largest export market (30% in 1Q03) and primary production base for many manufacturers.

If the consumption is adversely affected, consumer product companies and retailers might see slower growth in sales and profit. So called downstream electronics are likely to suffer the most due to the high exposure to China's domestic market.

However, the semiconductors and financials are likely to avoid adverse effects from the epidemic since they have a low exposure to the Chinese market. A suspension of business travel might have the effect of hindering the development of new products. Moreover this reduction in travel will together with the negative impact on tourism and service sectors lead to difficulties for the transportation industry. In contrast, the reluctance to use public transportation and travel in general will make telecom operators the major beneficiaries of the SARS outbreak.

The longer it takes to confine and control the epidemic the higher the impact will be on Taiwanese companies. These above factors contribute to a drop in commercial activities and consumption in the second quarter and have lead to a slowing economic growth according to The Directorate General of Budget, Accounting and Statistics (DGBAS). Growth during the first quarter was reported to have been cut to 3.21 percent from 4.22 percent the fourth quarter of last year.

Predictions by DGBAS suggest that the growth in the second quarter will slide from 3.06 percent to 1.2 percent, dragging down the GDP growth for this year to 2.89 percent as an effect of the worsening SARS outbreak. This is however quite an optimistic outlook compared to some independent research groups. A statement from the Taiwan Institute of Economic Research proposes that the growth for 2003 would be between 1.74 and 1.44 percent under the assumption that SARS is not contained by the end of the year. Compared to the ADB scenarios which give a reduction in the annual GDP growth to between 2.2 and 1.2 percent depending on whether SARS could be controlled during the second or third quarter.

It is interesting to notice the discrepancies between different forecasts. This acknowledges the difficulties involved in making an accurate prognosis and that the numbers presented should be regarded more as indications than a definite answers.

Microeconomic Effects on the Taiwanese Economy

This section is devoted to examining how the Taiwanese economy would be affected of a SARS epidemic.

The Impact on Taiwanese Companies

The impact of the SARS epidemic on Taiwanese companies will greatly depend on the time it takes to resolve the issue. Companies with higher exposure to China’s domestic market will have higher risk if the SARS outbreak cannot be contained in the near term. Companies in Taiwan that have a high proportion of production or sourcing in China are mostly downstream electronics companies.

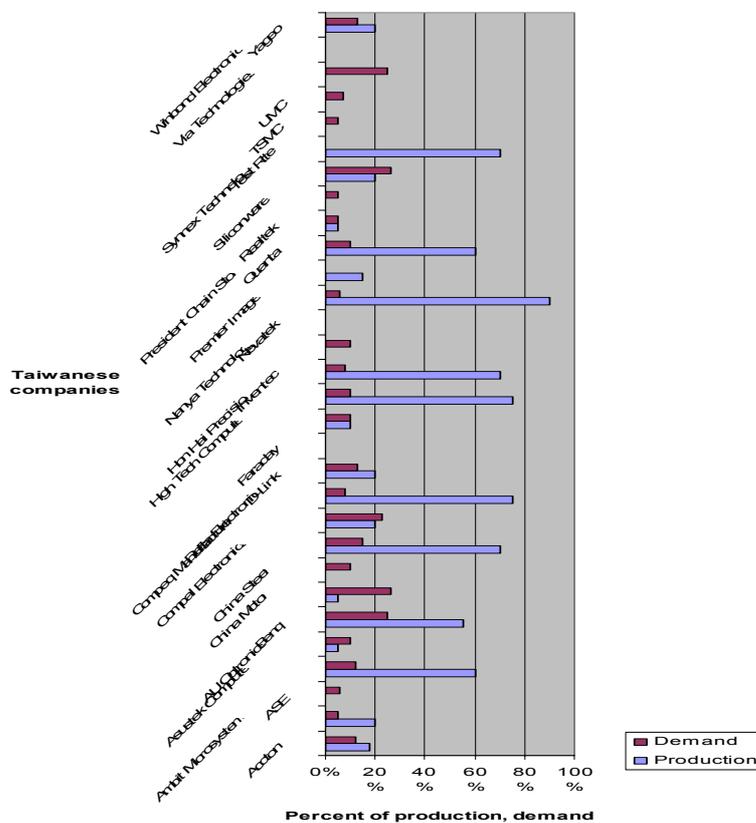
Premier Image, for example, has over 90% of its production in Foshan, Guangdong province. Another example is Delta, which have around 75% of its production in two of its manufacturing sites in Dongguan and Suzhou. See Table 1 for a further listing of Taiwanese companies with a high production base in China.

Company	%
Premier Image	90%
Delta Electronic	75%
Hon Hai Precision	75%
Compal Electyronics	70%
Inventec	70%
Test Rite	70%
Asutec Computer	60%
Quanta	60%
BenQ	55%

Table: Company with high proportion of production/sourcing make in China

China is a huge market for Taiwan’s industrial products, such as components and raw materials, but it is not as big for Taiwanese companies’ end-products.

Share of Taiwanese companies production and demand in China



Downstream electronics may suffer the most in the worst case scenario, where the SARS epidemic will have an impact during the second and third quarter for this year. This is mostly due to a high concentration of manufacturing bases located in China and frequent interaction required between US clients. Companies with the highest exposure to China's consumer market are mostly consumer IC designers in Taiwan. Their products are used to build devices such as electronic dictionaries, VCD/DVD players and other home appliances.

Select downstream companies also have high exposure to China's domestic market. These companies

include Benq, Compal, D-link and Asustek. For Benq and Compal, the impact is likely to be more severe, as their exposure to the China market is mainly high-margin mobile handsets.

The impact that the SARS epidemic in Taiwan might have on Taiwanese companies depend greatly on the ability for the companies to remain productive. If the SARS epidemic has no affect on the companies' workforce, they may uphold their high production/productivity and meet assumed customer demand. The impact of the SARS epidemic in Taiwan will resemble the impact that it has on businesses in China, where a suspension of business travel might have the effect of hindering the development of new products. As of today, many international companies have restricted their employees not to travel to Taiwan until they consider the SARS epidemic to be under control.

Christofer Salsing

Fredrik C A Jönsson

Conference Report – Telecom in Asia

Handset

According to Telecom Asia 2002 analysts, the Asia-Pacific region projects to have a strong handset sales growth in the coming years, buoyed by strong subscriber uptake and rapid migration to next-generation services.

The key findings and projections are as follows as of the end of 2005:

- Total handset shipments will rise from 162.3 million in 2001 to 296.2 million in 2005.
- With 3G taking a strong hold over regional markets by 2005, W-CDMA and cdma2000 1x-EV handset sales will dominate, with volumes of 129.3 million and 39.1 million, respectively.

While the Asia-Pacific region has already emerged as the largest cellular market in the world - evidenced by strong subscriber growth, especially in China and now India - the key driver for handset sales will be replacement sales, as subscribers rapidly upgrade their handsets to take advantage of next-generation services.

According to Shiv Putcha, analyst with the Yankee Group's Wireless/Mobile Asia-Pacific research and consulting practice, "The Asia-Pacific region's strong growth in cellular will extend to handset sales in the region as well. Given that GSM still dominates the Asia-Pacific landscape, it is crucial for its continued success that vendors like Nokia, Motorola, and Ericsson ease supply-side bottlenecks and ensure general availability of handsets for new GPRS and W-CDMA services. On the CDMA front, handset availability has been strong, but overall sales will be constrained by CDMA's second-place finish in the region to GSM and its migratory generics."

Telecom

Move aside North America and Europe. Asia is now the world's largest telecommunication market and leads the world in the deployment of advanced telecommunication technology, according to the ITU's (International Telecommunications Union's) Asia-Pacific Telecommunication Indicators 2002 report.

Most notable among the report's findings is that Asia, which is the world's most populous continent, in 2001 surpassed the Americas, including North and South America, and Europe in terms of the total number of telecommunication subscribers and was the only region to show significant subscriber growth in recent years.

Riding rapid subscriber growth in China, Asia is now home to 36 percent of the world's telecommunication subscribers, ahead of Europe at 35 percent and the Americas at 27 percent, the report said. Africa and the Middle East lagged far behind at 2 percent. By comparison, Asia represented 29 percent of the world's telecommunication subscribers in 1996, behind Europe (36 percent) and the Americas (33 percent). Africa and the Middle East accounted for 2 percent of all subscribers.

Asia's rise as the world's largest telecommunication market may seem inevitable given its large population but the report noted that the rapid rise of subscribers in the region was remarkable. While increases in teledensity in many Asian countries, such as China, Thailand and the Philippines, among others, represented the bulk of subscriber growth in recent years, more developed nations also played an important role.

Over the last 10 years, South Korea, Singapore, and Taiwan have added a total of 68 million new telephone subscribers, accounting for 10 percent of the regional total. Taiwan also leads Asia in the penetration of [mobile](#) phones, with a penetration rate of 96.6 percent for

mobile phones and the country now has more than 100 cellular subscriptions per 100 people, indicating that many Taiwanese have more than one mobile phone subscription. Despite having crossed what many observers consider the saturation rate, Taiwan's growing mobile services market shows no signs of slowing down.

Alongside rapid subscriber growth, Asian countries are also leading the world when it comes to deploying new technologies.

Asia is now home to 33 percent of the world's Internet users, 47 percent of its ADSL (asymmetric digital subscriber line) users and 95 percent of the world's 3G (third-generation) mobile subscribers, said Yoshio Utsumi, secretary-general of the ITU.

South Korea leads Asia and the world when it comes to the roll-out of broadband Internet services, with 58 percent of households having a broadband Internet connection in 2002, and five of the world's top 12 broadband economies are in the region. Indeed, South Korea is making good use of all this connectivity and Koreans spend more time online than citizens of any other country according to the ITU report.

The rapid growth of cellular services has propelled Cambodia to be the global leader in terms of fixed line versus mobile. Cambodia in 1993 became the first nation in the world where the total number of mobile subscribers exceeded that of fixed line, said Michael Mingues, head of the ITU's telecommunication data and statistics unit and one of the report's other authors.

The Government's role

Telecommunications plays an important role in socio-economic development of any country. That explains why telecom is as much driven by government policies in a particular country as it is by technology or costs. The government usually sets the broad telecom objectives and ensures standards compatibility. In the wireless space, the government plays the crucial role of spectrum allocation.

Unfortunately, in many cases the government also considers the national carrier (telecommunications overall) from purely monetary perspectives rather than as a driver for socio-economic development. This results in either unreasonably high tariffs or licensing fees or still worst, blocking new or disruptive technologies to protect state-owned telecom monopolies. Technology by itself cannot solve all problems of development, but it can help significantly. Governments need to understand this and identify new opportunities where telecom can promote community-building and economic progress. The government should also act as a facilitator for the growth of telecommunications—either wired or wireless—rather than treating their national carriers as pure cash cows.

Chinese Mobile Market

The market research and analysis are based on major handset vendors' strategies and business in China, mobile handset market dynamics, China handset user survey, and Korean Telematics Market Research.

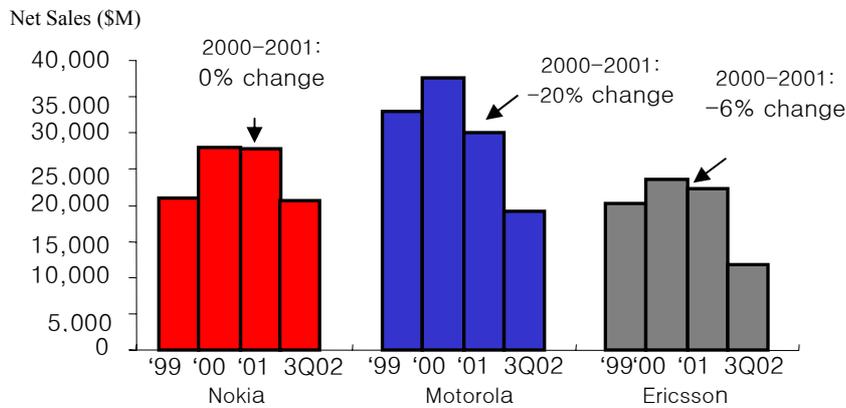
This part provides an overview of the Chinese mobile market covering a brief description of what are saving the handset market in China, where China is heading considering handset features and handset users, and why you should choose to invest in China. Furthermore, it also covers descriptions of what the mega trends and what the consumer trends are.

Saving the Handset Market

Diagram 1 shows the performance from year 1999 to year 2002 of the three leading handset vendors in China. The net sales reached the top in year 2000 for all the vendors. Motorola had the highest net sales followed by Nokia and Ericsson; nevertheless Motorola

also had the largest change in net sales in comparison to year 2000 with year 2001, where the net sales decreased by 20%, for Ericsson net sales decreased by 6%, and for Nokia the net sales was unchanged.

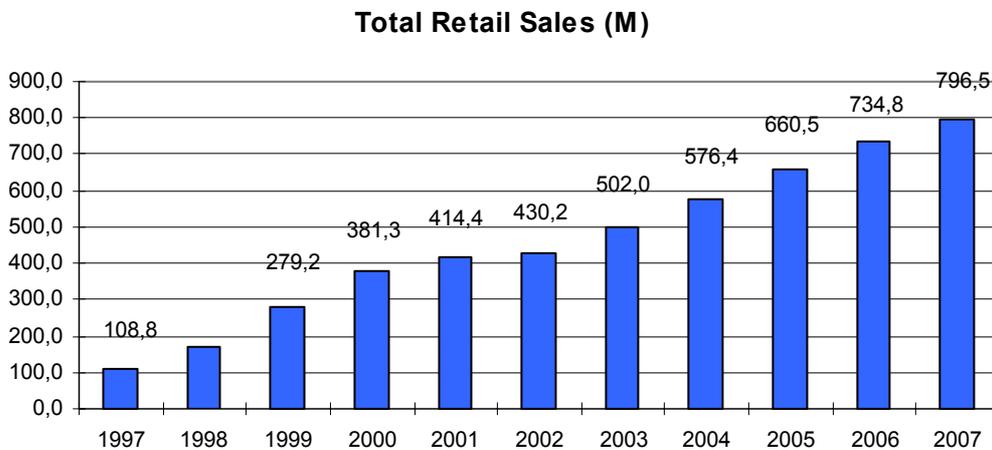
Diagram 1: Nokia, Motorola, Ericsson Performance '99-'02



Source: Pyramid Research

Diagram 2 shows past retail sales from year 1997 and market forecast for retail sales to year 2007. Past records show retail sales four-doubled from year 1997 to year 2002, and analysis point out the retail sales will increase annually to year 2007 reaching a height of 796.5 million, which is almost the double total retail sales in compared to year 2002.

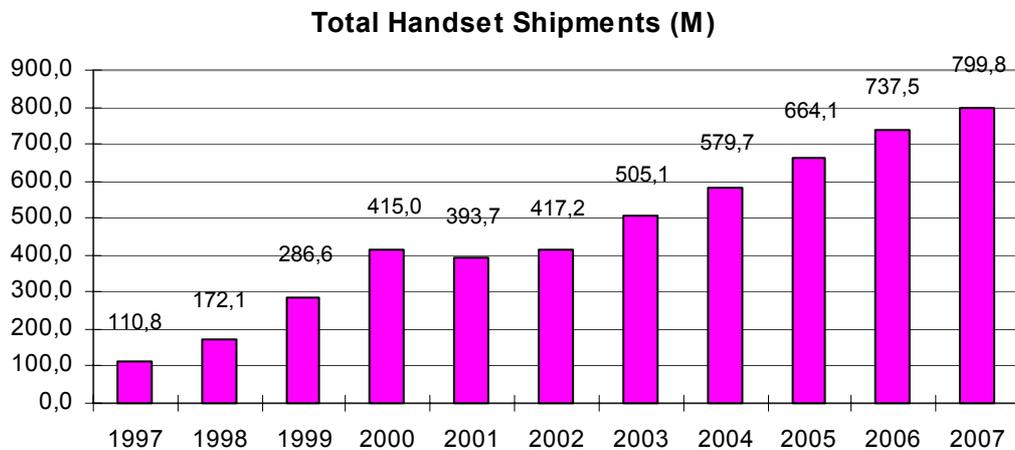
Diagram 2: Total retail Sales



Source: Strategy Analytics

Diagram 3 shows the growth of total handset shipments to China from foreign vendors. The total handset shipments have increased almost four times from year 1997 to year 2000, thus decreased in year 2001 to 393.7 million. However, the total handset shipments recovered in year 2002 and increased by 2.2 million in comparison to year 2000. Forecast shows that handset shipments will steadily grow annually to year 2007, almost to the double compared to year 2002.

Diagram 3: Total Handset Shipments



Source: Strategy Analytics

Past records and forecasts from diagram 2 and 3 indicate that there are potential growths in the Chinese market for handsets in the next five years. In addition, by looking at net sales changes in diagram 1 and the forecast in diagram 2 and 3 point out that 40% annual growth days are over, however still there are great potential growths for the handset market. Growing foreign investments saves the handset market in China.

Way to Go

In the Chinese market low-and-mid end handsets are dominating and will continue to dominate the coming years. New features 3G services like MMS, LSB, Multimedia service (VOD, ADO, etc) will be available on handsets next year. Furthermore, a framework mapping the Chinese users preferences shows that early adopters and active users that are old users of using handsets prefer new features and services on the handset, while newcomers and low-end/entry level users (new users) enter buying handsets prefer basic features and services. Low-end/entry level users that are old users and are actively using the handset increase adaptation for wanting new features and services on the handset. Low-and-mid end users will conversely in short term overcome basic features and services going in to preferring latest features and services.

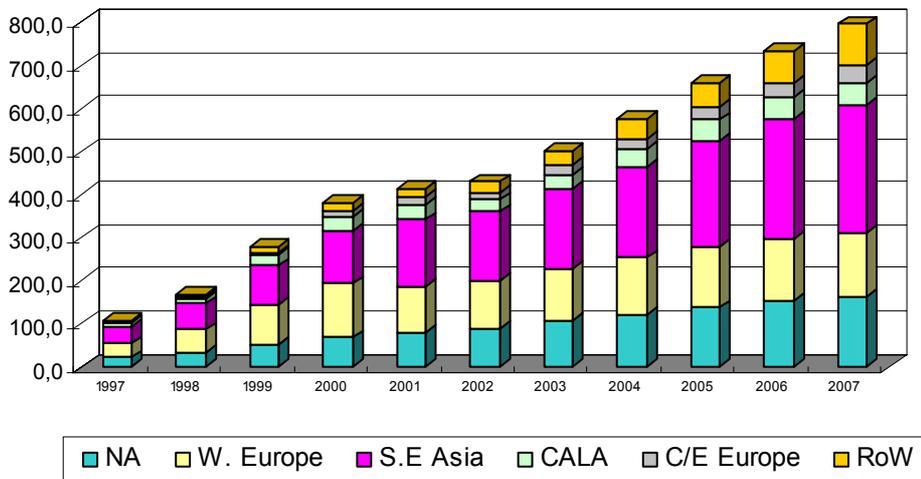
Why China?

Before China had entered WTO, the Chinese government controlled the competition in the market at an advantage for the two largest operators in China, which are China Mobile and China Unicom. Foreign companies had difficulties to establish in China because of tough policy, regulation, and high taxes. However, when China entered WTO, the Chinese market deregulated and this stimulated and still stimulates foreign investments.

In diagram 4, forecast shows the potential growth in handsets sales in South East Asia is greatest each year in the next five coming years in comparison to other regions. The growth in

handsets sales is forecasted to be almost the double in year 2007 compared to year 2002. In South East Asia, China stand for the greatest growth in handsets sales.

Diagram 4: Handsets Sales by Region (M)



Source: Strategy Analytics

In figure 1, it shows that China among Malaysia, Philippines, and Thailand are the countries in South East Asia that are fastest growing in purchasing handsets. China is directly below the level where the mass market can afford to buy handsets. This indicates tremendous potential purchasing power in the next few years.

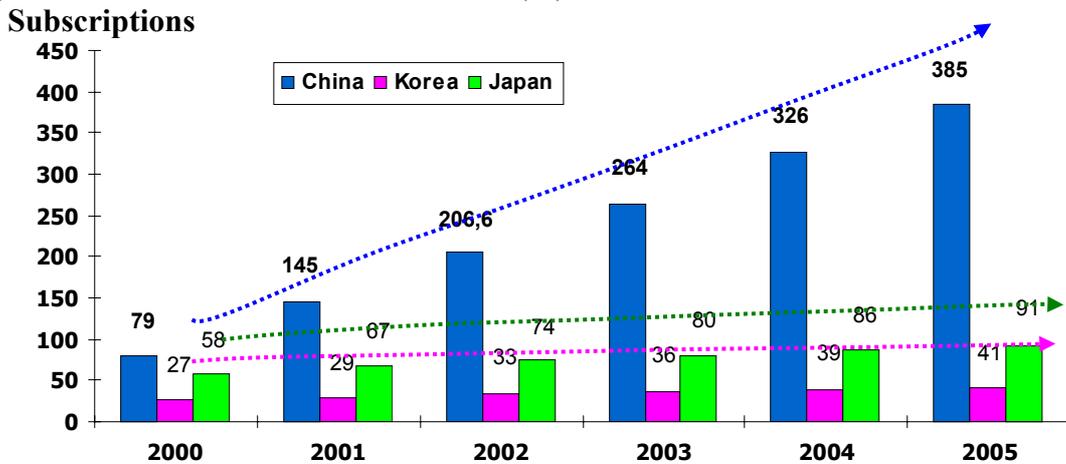


Figure 1: Market Polarization and Changing Business Emphasis, source: MindBranch Asia Pacific

Diagram 5 shows the market size of total users in East Asia. Both Korea and Japan had little growth in new subscriptions for the last three years and will remain growing slowly for the coming years. Total users in China on the other hand are growing fast and will almost double subscriptions in year 2005 compared to year 2002. The numbers of subscribers in China are forecasted to reach up to 385 million in year 2005, while Korea and Japan are

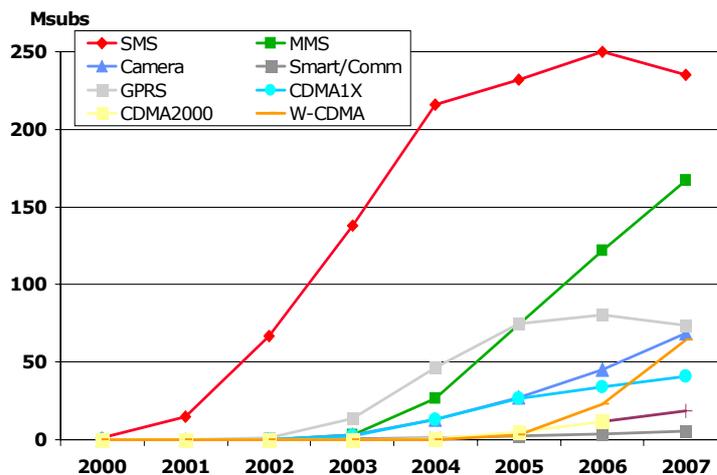
forecasted to reach up to 41 million and 91 million respectively, which are three to four times less than China.

Diagram 5: Total Cellular User in East Asia (M)



Source: Mindbranch Asia Pacific, Strategy Analytics, BIS Shrapnel, and MFC Insight
 Diagram 6 shows device penetration in million subscribers. SMS and MMS are forecasted to have the largest penetration in the next five years.

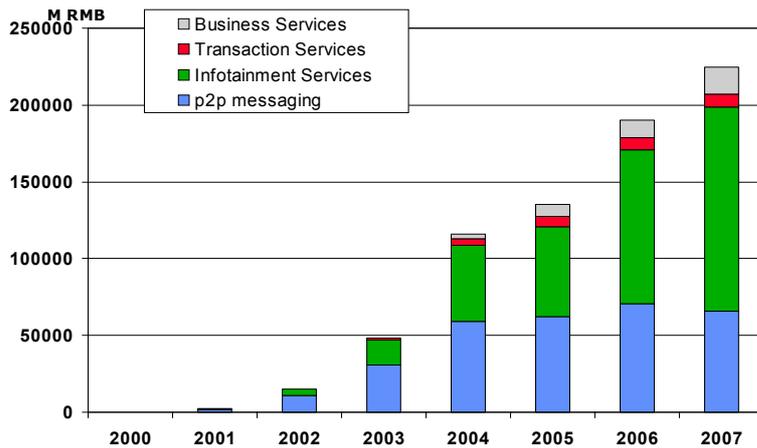
Diagram 6: Device Penetration



Source: Mindbranch Asia Pacific, MFC Insight

Diagram 7 shows mobile data revenues in million RMB. Infotainment services stand for the greatest growth in the next five years followed by person-to-person messaging.

Diagram 7: Mobile Data Revenues



Source: MindBranch Asia Pacific, MFC Insight

Mega Trends

Five driving forces of Chinese mobile market are coordinated competition, economic growth, WTO, need for communications, and new technologies. Still, after that China having entered WTO, they continue to coordinate the competition by leading the market to grow steadily in a pace that is in advantages for their operators China Mobile and China Unicom. Although foreign investments are made and increase greatly, China is keeping on control of the market growth. Moreover, economic growth in the country increases the populations' income level making the mass-market affordable buying handsets in the coming years. In addition, joining WTO opens the market for foreign corporations making investments, which initiates economic growth at an even faster pace. The service charge for using handsets is lowered to spur more mobile users and increasing active users triggers a need for communications. And new technologies WCDMA, CDMA2000, and TDS-CDMA expand the scope of providing users even better services to affordable cost.

Consumer Trends

Youngsters in major cities are increasingly using handsets and so are females in all age groups. Design of the handset is most important to the users in comparison to size, brand, and feature.

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