

Report on Taiwan Mission

May 9, 2011

GRIPS Development Forum

A policy research team visited Taipei, Hsinchu and Kaohsiung in the Republic of China during March 21-25, 2011 to study Taiwan's industrial policy and its formation mechanism¹. The mission consisted of Prof. Kenichi Ohno, Ms. Sayoko Uesu (GRIPS Development Forum); Mr. Berihu Assefa Gebrehiwot (GRIPS and Ethiopia Development Research Institute); Ms. Nguyen Thi Xuan Thuy and Ms. Pham Thi Huyen (Vietnam Development Forum). Ms. Uesu participated in Taipei meetings only.

The issues we investigated in Taiwan were (i) past and current industrial policy and its formulation; (ii) technology and R&D policy; (iii) industrial park creation and operation; and (iv) small and medium enterprises (SMEs). We visited government ministries and agencies, policy and technology research institutes, industrial parks and their management organizations, and one private firm operating in an export processing zone (EPZ). The mission schedule, interviewees and information gathered are listed in the attachments. We would like to thank all the people we met in Taiwan for their kindness and hospitality.

Main findings of the mission are reported below.

1. Past policies and new direction

In 2010, Taiwan's per capita GDP was \$19,046 and its real income was equivalent to Japan's level.² Taiwan has successfully transformed itself from an agro-based economy exporting rice and bananas to a highly industrialized silicon island with large global shares in mask ROM (93.8%), IC foundry (66.4%), blank optical disk (63%), IC package (44.4%), electronic glass fabric (39%), IC design (27%), DRAM (21.8%), etc. Moreover, if overseas production (including Mainland China) by Taiwanese firms is also included, Taiwan is by far the top exporter of such ICT hardware as motherboard (95.5%), notebook PC (95%), server (88.9%), WLAN CPE (81%), cable modem (78.6%), portable navigation device (76.9%), LCD monitor (71.8%), and so on.³

Taiwan's industrial policy thrust and its key industry shifted over time as follows.

¹ This mission was commissioned by the Japan International Cooperation Agency to compile information on industrial policies in selected East Asian advanced countries for the policy learning of developing countries including Ethiopia and Vietnam. For this purpose we previously also visited Singapore in August/September 2010 and South Korea in November 2010.

² Japan's per capita income in 2010 was \$42,325 but Japanese prices are much higher than Taiwan's. As a result, living standards in the two economies are similar. Using Angus Maddison, *The World Economy: Historical Statistics*, OECD Development Centre (2003) and updating with IMF data, Japan's price-adjusted per capita income in 2010 was estimated at \$21,900 while Taiwan's was \$22,227.

³ These global market shares for 2009 are provided by the Ministry of Economic Affairs of Taiwan.

1950s – import substitution – food industry
1960s – export expansion – textile industry
1970s – infrastructure enhancement – petro-chemical industry
1980s – economic liberalization – IT industry
1990s – industrial upgrading – IC industry
2000s – global deployment – LCD industry

Up to the mid 1980s, this remarkable transformation was driven by a powerful bureaucracy (Industrial Development Bureau of the Ministry of Economic Affairs (IDB/MoEA)—see below) and a handful of key elite figures that constituted a developmental state model described as “Governing the Market” by Robert Wade. At that time, principal policy instruments included SME finance, market entry regulation (to protect SMEs), trade promotion agency, credit facilities and insurance, and technical assistance by government-created research institutions. SMEs in Taiwan were dynamic and responded strongly to these policy initiatives. In those “old days,” SMEs were Taiwan’s main exporters while a few large corporations such as Formosa Plastic (private) and China Steel (state-owned) supplied to the domestic market.

After the mid 1980s, a number of structural shifts occurred. First, the private sector became more powerful relative to the government. Second, large domestic firms emerged while the relative share of SMEs in output, export and employment all declined. Third, liberalization, economic interaction with Mainland China and WTO entry (2002) exerted global competitive pressure. Currently Taiwan’s largest firms include TSMC (semi-conductor), UMC (semi-conductor), AUO (LCD), Foxconn (EMS), Acer (PC), Asus (PC), Yulon Motor (automotive), San Yang Motors (SYM, motorcycle) and Kwang Yang Motor (Kymco, motorcycle). Previous giants are also moving into new fields including Formosa Plastic (artificial fiber) and China Steel (high quality steel for auto, E&E and machinery).

With the growth of vibrant domestic firms, Taiwan’s industrialization is no longer mainly dependent on FDI or expatriates. Even today, Taiwanese SMEs remain more autonomous (not under keiretsu or chaebols) and have higher start-up ratios (turnover of 7.1% per year) than Japanese or Korean. However, as globalization deepens and size becomes increasingly important, large firms are becoming dominant and the role of SMEs in industrialization is shrinking. Nevertheless, even large firms feel that they are too small compared with Korean chaebols and want to grow more with brand-name products. Contracted hardware manufacturing for foreign brand-name electronic products—original equipment manufacturing (OEM), original design manufacturing (ODM) and electronics manufacturing service (EMS)—has already reached a plateau and Taiwan needs a new business model to grow into the future.

Given these trends, industrial policy of the Ministry of Economic Affairs (MoEA) is also changing. In Taiwan, the industrial policy statute is the most important legal document for

industrialization. The first such law, the Statute for Encouragement of Investment (1960-1990) and its revision, the Statute for Upgrading Industries (1991-2010), guided past policies. The most recent one, the Statute for Industrial Innovation, approved by the National Assembly in May 2010, sets future directions for Taiwan's industries⁴. Three features of the new statute are noteworthy. First, it expands policy scope from the previous manufacturing focus to include agro and biotech industries, industrial services and high-value services (which requires involvement of ministries other than MoEA). Second, it replaces the previous system of multiple incentives for various specified activities by a simpler, more uniform system of 17% corporate income tax (previously 25%)⁵ and eliminates all tax incentives except for R&D⁶. Third, it aims to shift Taiwan from hardware manufacturing to an economy of "soft power" with national brands and regional logistic and transport hubs. Like many other high-income economies, Taiwan wants to become an innovation-driven economy as it graduates from factor- and efficiency-driven ones of the past.

Taiwan's current industrial policy, as explained by MoEA, has two pillars: creation of soft power and improving cross-strait relations. The soft power drive has three sub-components: (i) supply of industrial professionals; (ii) promoting emerging industries;⁷ and (iii) upgrading conventional industries including ICT, garment and footwear. Even without tax incentives, MoEA can promote targeted sectors and activities through technology projects commissioned by the Department of Industrial Technology (DOIT) and other agencies, as explained below.

Regarding cross-strait relations, restrictions on China-bound investment were relaxed in August 2008 with higher permissible ratios or value ceilings for corporate and individual investors. Meetings, seminars and industrial collaboration with Mainland China were also activated. Taiwan's market is also opening, gradually and based on observation of actual performance, to Chinese investors since June 2009. The recent cross-strait Economic Cooperation Framework Agreement (ECFA), effective from January 2011, is expected to have further impacts on cross-strait relations. ECFA is modeled after the ASEAN-China FTA which features "early harvest" trade items in goods and services.

With the exception of Mainland China, Taiwan does not care about the nationality of investors whether they are domestic, foreign or joint venture. Taiwan accepts FDI in any

⁴ The statute gives only guidelines. For implementation, detailed laws must be prepared for all relevant sectors. Concerned ministries are currently working on them.

⁵ Corporate income tax rates of neighboring countries are as follows: Japan (30%), Korea (22%), Singapore (17%), Hong Kong (16.7%), and China (25%).

⁶ Previous tax incentives amounted to about NT\$70 billion per year, of which tax holidays, mainly benefiting large firms, were about NT\$20 billion, automation tax credits were about NT\$30 billion (both of which are now abolished), and IT tax credits were about NT\$20 billion (now halved). As a result of the new industrial statute, only NT\$10 billion remains. As of end March 2011, US\$1 is worth about NT\$29.

⁷ Six "major emerging industries" are biotechnology, precision agriculture, green energy, medical and healthcare, tourism and cultural innovation industries. Four "emerging intelligent industries" are invention and patent commercialization, cloud computing, electric intelligent cars and intelligent green construction industries. Besides these, 10 service industries are also targeted which are however outside the mandate of MoEA.

sector except in national defense. Taiwan provides a universal low corporate income tax and transparent incentives for R&D only and, unlike Singapore, does not engage in customized negotiation to attract individual foreign investors.

2. Policy making process

As noted above, the most important policy making body for Taiwan’s industrialization is the Industrial Development Bureau of the Ministry of Economic Affairs (IDB/MoEA). Although its influence has waned over the decades, it still yields substantial power in guiding the private sector. IDB currently has 240 permanent staff mainly from engineering backgrounds (recruitment of economists into IDB is only a recent phenomenon). Temporary staff are also hired to cope with its heavy work load. Unlike Japanese METI, many processes in policy drafting and stakeholder consultations are outsourced to government-created semi-official policy “think tanks,” especially the Taiwan Institute of Economic Research (TIER) and the Chung-Hua Institution for Economic Research (CIER), as discussed below. “Committees” are used for consensus building among ministries and experts, and “seminars” are extensively organized for interacting with the private sector. In Taiwan, think tanks, committees and seminars are not just means of information exchange and dissemination but integral parts of action-oriented policy making. They will not be assessed highly or receive much funding unless they directly contribute to the policy process.

Figure 1. Organizational Structure of the Ministry of Economic Affairs

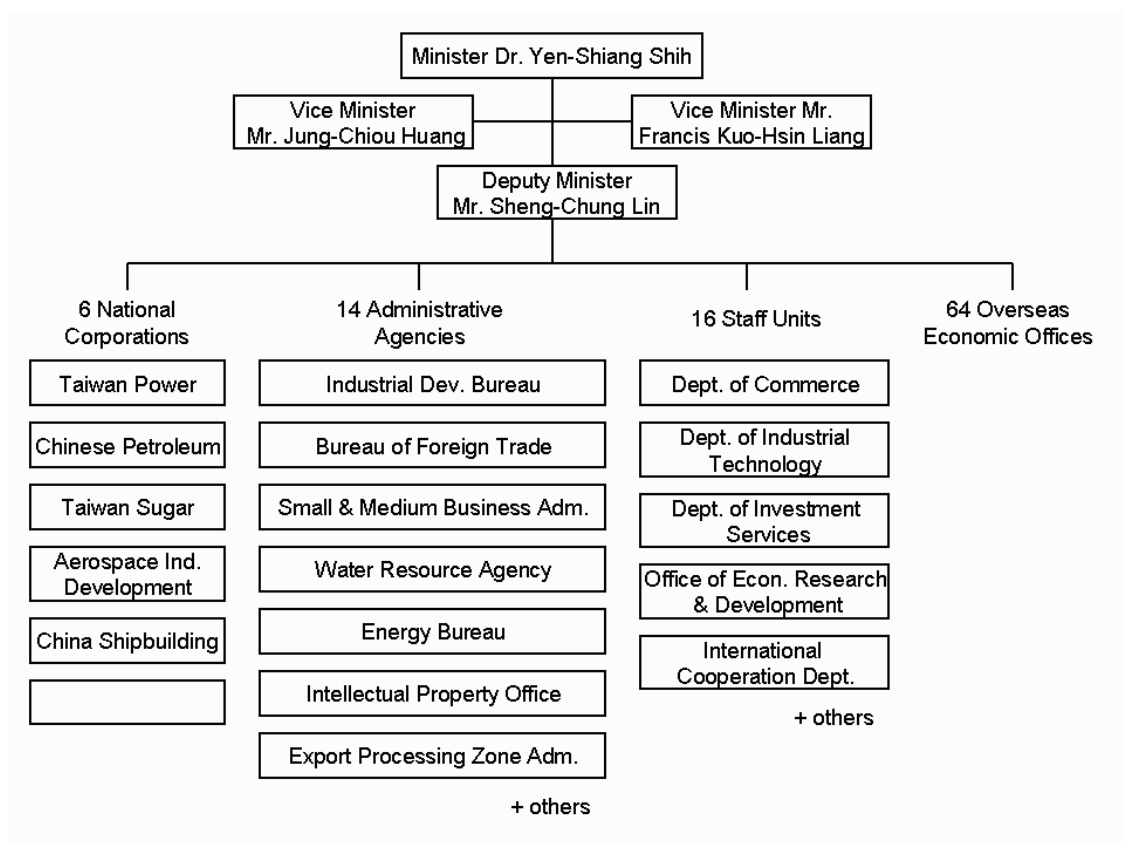
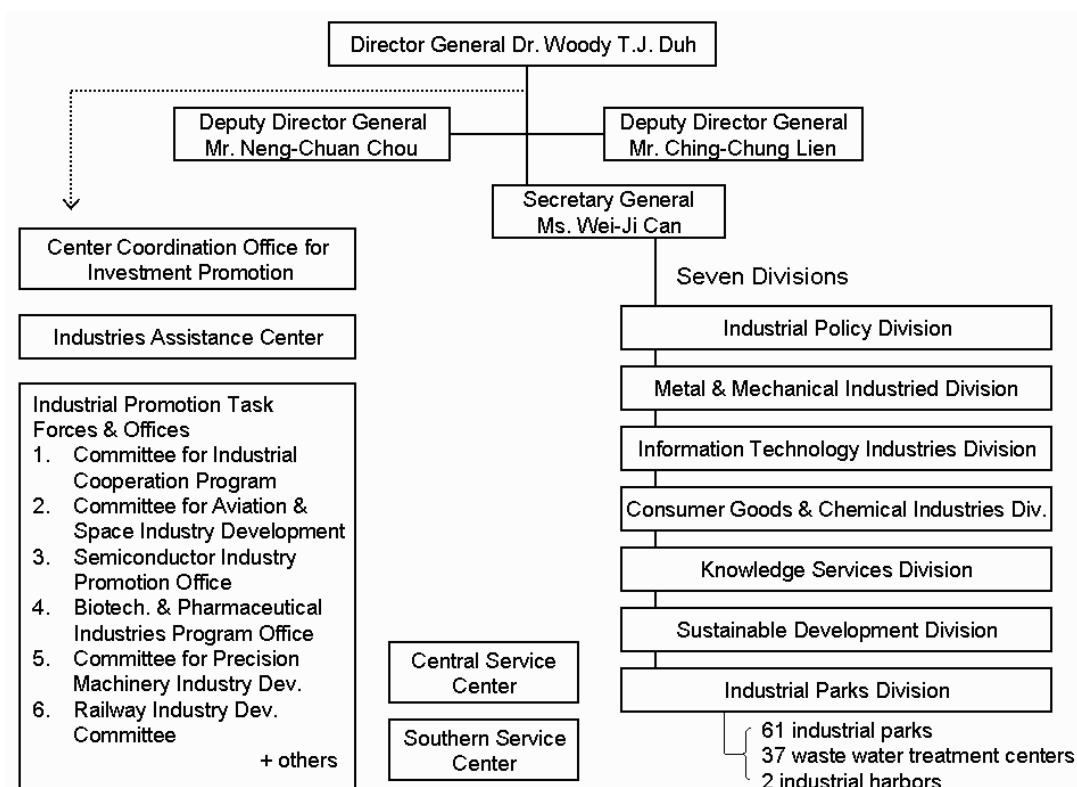


Figure 2. Organizational Structure of the Industrial Development Bureau, MoEA



IDB has seven divisions which include three “industry-oriented” (i.e., sectoral) divisions (metal and mechanical, IT, and consumer goods & chemicals) and four “industrial support” (i.e., functional) divisions (industrial policy, knowledge services, sustainable development, and industrial parks). Besides these, task forces and offices for sectoral promotion are also placed under IDB. Restructuring of MoEA is expected for the implementation of the new industrial statute which has a wider sectoral scope than the previous one.

Another important body under MoEA is the Department of Industrial Technology (DOIT). Its main task is to identify, screen and finance projects that will directly enhance technology of the private sector. In 2010, the national budget for science and technology was allocated among the National Science Council (43.0%), MoEA (30.8%) and Academia Sinica (11.0%). DOIT received US\$618.1 million, which was the lion’s share of this fund allocated to MoEA. DOIT uses this to finance projects conducted by research institutes, private organizations or universities that support national industrial policy. Funding is allocated competitively, based on proposals submitted by applicant organizations (DOIT sometimes works closely with them to improve proposals) and outcome is reviewed strictly by DOIT advisory groups for alignment with national policy and key performance indicators such as number of patents and awards, levels of R&D relative to GDP or corporate revenue, and so on. DOIT’s

technology projects have been a very important policy tool for Taiwan's innovation drive⁸.

The process of industrial policy making, in the case of the Statute for Industrial Innovation of 2010, was as follows.

In anticipation of expiration of the previous industrial law (Statute for Upgrading Industries, 1991-2010), a taskforce was created by IDB/MoEA three years in advance to draft a new law. MoEA Minister Dr. Yen-Shiang Shih, an MIT graduate, led brainstorming sessions which were organized by CIER, a think tank in support of MoEA policy. According to one IDB official, "Dr. Shih dominated this law and vision." The proposed ideas were then conveyed to the private sector through a large number of public hearing meetings with six business associations (steel, IT, etc). These meetings were mainly used for the Ministry to "persuade them" for easy passage of legislature rather than receiving substantive comments from the private sector. Sometimes private firms had divided opinions.

In addition, "one or two inter-ministerial meetings" were also held with Dr. Shih presiding and ministers of other related ministries attending. Interventions by other ministries were few and no objections were raised against MoEA's ideas. While MoEA has historically dominated industrial promotion, other ministries in charge of services, agriculture, health care, education, culture, etc., which are now included as targeted sectors, are only "regulators" unfamiliar with positive promotion measures (issuing certificates for R&D, for example) and remained passive on the listening side. After these consultations, the Industrial Policy Division of IDB/MoEA drafted the law with support of law firms for wording.

However, the draft law prepared by IDB was substantially revised in the legislative process. Taiwan's National Assembly is strong and attracts lobbying by interest groups. The law drafted by technocrats originally proposed lowering of the corporate income tax from 25% to 20% and kept four incentives for R&D, branding, human resource training and attracting headquarters of MNCs to Taiwan. The National Assembly, backed by industrial and SME lobby, slashed the corporate income tax rate further to 17% and eliminated all incentive measures except for R&D (though the Ministry of Finance was concerned about revenue loss). According to one industrial expert, this was too aggressive an act by legislature but results must be accepted as a compromise in democracy. Finally, an "island tour" was conducted in the North, Middle and South of Taiwan to disseminate the new law.

The policy making procedure as described above was established around the late 1980s when the previous industrial statute was formulated. Before that, a few elite leaders and technocrats created policies while research institutes produced internal studies only.

In sum, consensus building over the contents of the new law was strongly guided by MoEA,

⁸ DOIT is the main department for technology project funding although IDB and SMEA, also under MoEA, have budgets for industrial purposes. MoEA has bureaus, departments and administrations under it as shown in Figure 1. It seems that bureaus are larger than departments, and administrations are tasked with implementing functions.

especially Minister Shih, with CIER serving as secretariat. However, consultation with other ministries and the private sector was somewhat unilateral in the case of the 2010 Statute. Another unique aspect of Taiwan is strong legislative intervention which upsets the picture painted by technocrats.

Regarding this policy making process, we heard many non-government voices. According to one expert, private firms often complain that government does too much R&D which competes with and crowds out private R&D. However, another expert argued that government must be more proactive in pushing innovation in the 21st century. One expert said that private firms (especially SMEs) are still willing to listen to government because government-backed R&D and technology transfer are useful to them. Another scholar stated that “embedded autonomy” (government with close interaction with businesses without being hijacked by vested interests) was possible in Taiwan because of such historical factors as social mobility, fair competition without class discrimination, and leadership paranoia over external threats previously from Communism and now from integration pressure. A number of experts expressed mild doubts about the prospects of the current innovation drive (biotech is slow to emerge, for example).

3. Policy and technology research institutes

In Taiwan, there are 19 government-related research institutes created by MoEA which play vital roles in designing and implementing national industrial and technology policy. Some of them received seed money at establishment but they now operate as NPOs competing for funds for industrial projects commissioned by both government and private firms. These research institutes can be classified into policy think tanks (TIER and CIER, for example) and technology support institutes (ITRI, III (triple eye), and sectoral institutes for metal, auto, bicycle, precision machinery, etc.) The mission visited four of them.

Among policy research institutes, the Taiwan Institute of Economic Research (TIER) and the Chung-Hua Institution for Economic Research (CIER) are two think tanks created by and supporting the policy making of MoEA.

TIER, founded in 1976, maintains a databank of Taiwanese industries, conducts domestic and global economic forecasts, and acts as secretariat to the Industrial Development Advisory Council as well as several cross-strait economic cooperation projects, among other things. It also conducted the impact study of ECFA (increased trade with Mainland China). TIER has seven research divisions, several service providing centers, Tokyo Office, and other departments and committees. Its revenue comes from undertaking government projects (about 70%) and private sector projects (about 30%). The Industrial Development Advisory Council, to which TIER serves as secretariat, is a platform for interaction among government, businesses and academics established in 1984 following the Japanese model of MITI's Industrial Structure Council. MoEA uses the Council to fathom the impact of its policies and hear the requests and problems of the business community. The Council holds

15 meetings per year, two of which are organized by IDB/MoEA and others by other bureaus of MoEA.

CIER, established in 1982 with the official endowment of NT\$1 billion, is located on the premises of the National Taiwan University. Like TIER, it conducts commissioned projects for the President, the Executive Yuan (Taiwan's executive branch), and government ministries and agencies. It has three research divisions that conduct applied research respectively on Mainland China, international issues and domestic issues. CIER also produces economic forecasting and operates the WTO Center as well as other *ad hoc* centers. CIER was the secretariat to the formulation of the 2010 industrial statute, ECFA and WTO entry. For ECFA, for example, CIER conducted 2-3 years of research and produced a report on ECFA's costs and benefits which was circulated to the public and academia for critical review. The report was then discussed among concerned ministries and agencies, businesses (through "seminars"), and finally with legislators before it was sent to the National Assembly. CIER feels that about 70-80% of what it proposes in its report makes to the final stage.

Among 11 technology support institutes, the mission visited the Industrial Technology Research Institute and ITRI College in Hsinchu and MIRDC in Kaohsiung.

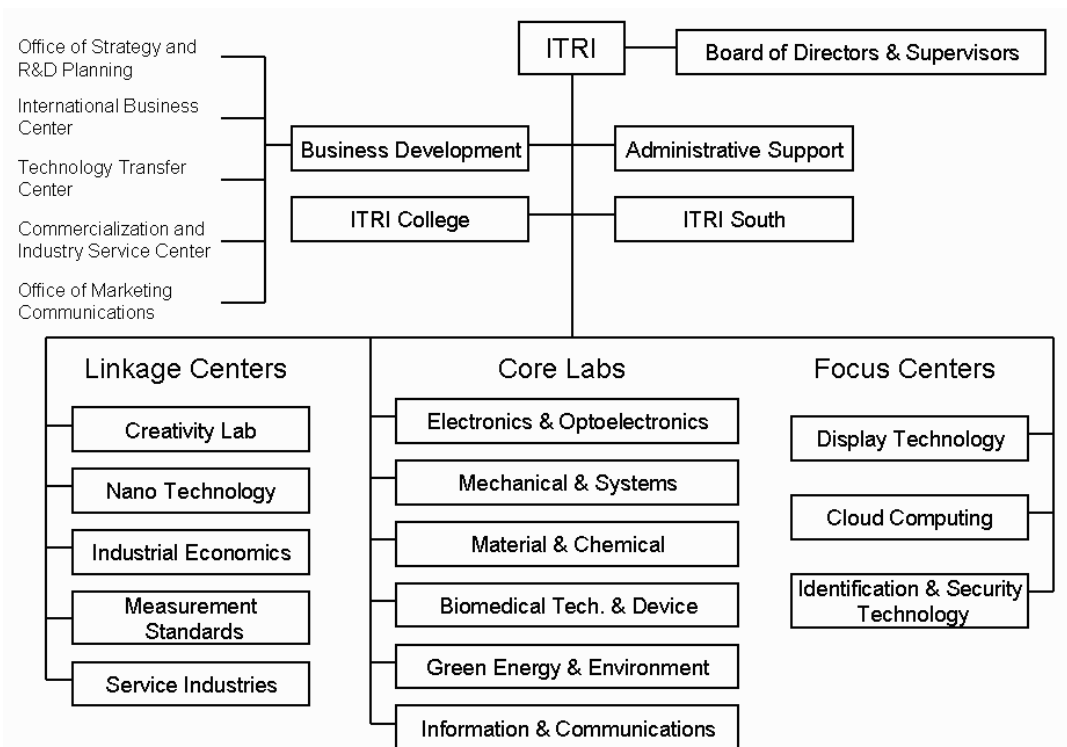
The Industrial Technology Research Institute (ITRI), founded in 1973, is Taiwan's largest R&D organization in support of technology transfer and commercialization. Its supervising agency is MoEA. ITRI has 5,800 employees in its huge complex, of which 80% are engaged in R&D and 1,200 hold doctorate degrees. There are three ways to disseminate R&D: (i) technology licensing; (ii) spinning off a research team to form a start-up company⁹; and (iii) forming a joint venture to become a new section in an existing company ("spin-in"). ITRI also offers open labs where domestic and foreign companies can send staff to do joint research with ITRI researchers using ITRI facilities. Half of ITRI's revenue comes from industrial service fees and the other half from state-funded research projects on a competitive bidding basis. ITRI is commissioned to plan, train and formulate policies mainly for MoEA but also for other ministries. Its location in Hsinchu, in proximity to science parks and two technology universities, allows active cooperation with private firms and academia although ITRI also works with partners all over Taiwan. Many graduates from the two universities join ITRI for several years to learn industrial application and accumulate practical experiences, then start migrating back and forth between industry and ITRI. Thus, ITRI is the largest focal point for industry-government-academia cooperation to carry out MoEA's technology development programs.

ITRI College, a new addition to ITRI, is a training provider for ITRI employees at all levels as well as for industry. It offers courses lasting from one day to three months on five innovation

⁹ Taiwan Semiconductor Manufacturing Company (TSMC) and United Microelectronics Corporation (UMC), the two world largest IC foundries, are ITRI's most famous spin-offs. ITRI has produced 65 ventures and 19,589 ITRI alumni.

competencies and six technological domains¹⁰. It also offers customized training programs for enterprises. It issues certificates but no degrees because its courses are for the actual use by industry to create value and not for academic merits. Of particular interest are its need-based programs for government officials and researchers from developing countries in such topics as national innovation system, human resource development system, SME promotion, science park development and intellectual property management. In 2010 ITRI College received four official delegations from Vietnam and Philippines (about 25 persons each) as well as India and Poland (2 persons each). However, Taiwan is not conducting knowledge sharing as a national project, and the size of its intellectual assistance to the developing world remains small compared with Japan or Korea. Political concern vis-à-vis Mainland China is another reason for Taiwan to remain low-key in its assistance activities.

Figure 3. Organizational Structure of the Industrial Technology Research Institute



The Metal Industries Research and Development Center (MIRDC), established in 1963, is one of the sectoral technology institutes under MoEA. It is headquartered in Kaohsiung with eight branches and centers across Taiwan. It supports metal and related technologies, including automation, with 612 employees (51 with doctorate and 325 with master degrees) with main specialization in mechanical (38%), material and chemical (11%) and electrical, opto-electronic and info-tech (8%) areas. Its annual staff turnover is 10% and the average

¹⁰ The five innovation competencies are creative thinking, industrial analysis, R&D management, business development, and intellectual property management. The six technology domains are information and communication, materials and chemical engineering, electronics and optoelectronic, biomedical technology and device research, mechanical and system research, and energy and environment management.

working period is 10 years (at ITRI, they are 20% and 6 years respectively). MIRDC also hires staff on a contract base. It has five focused industries of metal material and fabricated metal products, mold and die and micro parts, automotive, opto-electronics and energy equipment, and medical devices and care. Its revenue of NT\$2 billion per year comes from industrial services (25% directly from private sector, 35% commissioned by government) and government's technology projects (40%). A team is formed for each project which may last for 4-5 years for big projects and 3-6 months for small ones. For a large DOIT-funded project, for example, about two years are spent for sounding local industry needs and working out a proposal jointly with DOIT. If approved, implementation and monitoring will usually take 3 to 4 years. As with other institutes, MIRDC must bid competitively for projects and their performance is reviewed for number of patents and companies helped, new investments and technology applications generated, and so on.

4. Hsinchu Science Park

In Taiwan, there are three types of centrally managed industrial estates with different overseeing authorities: 13 science parks under the National Science Council, 8 export processing zones under the EPZ Administration of MoEA, and 61 industrial parks under IDB/MoEA.¹¹ Besides centrally managed industrial estates, Taiwan also has 18 industrial parks developed by local governments and 93 industrial parks developed by the private sector.

The National Science Council, through its Science Park Administration, supervises Taiwan's 13 science-based parks. Among them, Hsinchu Science Park (HSP), established in December 1980, was the first and most successful, and has become the central location for Taiwan's ICT industry with high international reputation. It now receives about 1,000 visiting missions annually from all over the world to learn how such a high-tech park can be created and managed. In its 30-year history, the number of tenant companies, their revenues, and park employment grew significantly, which as of 2010 stood at 449 companies, US\$40.9 billion and 139,416 employees (including 4,134 foreigners of which 1,074 are highly skilled), respectively. The average R&D/sales ratio at HSP was 6.0% in 1989-2008 against the national manufacturing average of 1.1%. Land in HSP is state-owned and leased out on a 20-year contract at subsidized rates to domestic and foreign firms with no intervention in companies' activities. 400 standard factories with the size of 700-1,000 m² are also available for rent (a firm may rent more than one unit). The monthly rent is NT\$50/m² for land and NT\$100/m² for rental factory. One-stop service, good infrastructure and comfortable living conditions are guaranteed.

¹¹ Industrial parks under IDB/MoEA (last category) focus on light industry, basic consumer goods, petrochemical, etc. with regional specialization and local regulatory differences. Unlike science parks or EPZs, these industrial parks can sell land to investors. On the other hand, they may not provide one-stop investor service. There is a plan to merge the administration of EPZs and MoEA-managed industrial zones. Besides these centrally managed industrial estates, Taiwan also has 18 industrial parks developed by local governments and 93 industrial parks developed by the private sector.

By company revenue, HSP's largest industry is IC (67.5%) followed by opto-electronics (20.7%), computer (6.4%), telecom (2.7%) and precision machinery (1.8%). Its renowned tenants include TSMC, UMC, Acer, Foxconn, AUO, Logitech, Du Pont, Hoya, Shin Etsu and DNP. HSP is host to 44 foreign firms, of which 10 are Japanese and 17 are American. 95 companies were set up by overseas Chinese.

Although HSP's land (653 ha) has no plan for future expansion, there is a relatively high turnover of tenant companies whose number is continuously increasing. Instead of enlarging HSP, satellite parks are created to accommodate more firms. At HSP, about 30 companies move in every year. As for the number of the companies move out, it depends on the fluctuations in economy and differs every year. Average land size per factory is becoming smaller over the years, which is the intention of the Science Park Administration. Applying companies are given exams regarding their R&D activities, capital, environmental concern, etc. There are about 60 companies waiting to enter HSP at present. Companies which fail to spend at least 2.28% (twice the national average) of sales revenue on R&D, or those which miss monthly payments twice, are asked to leave HSP.

The Science Park Administration is a central agency which has invested about NT\$86 billion since the establishment of the park. Besides state investment, HSP's income came from management fee and rental and operational revenues. HSP started to make profit ten years ago and now enjoys stable revenue. Because HSP is the leading science park, it financially assists other science parks in Taichung, Tainan, etc. and monitors their operations.

5. Export processing zones

Taiwan established its first export processing zone (EPZ) at Kaohsiung Port in December 1966, combining the functions of free trade zone and industrial zone¹². Its industrial focus changed over time along with overall structural transformation of Taiwan. Its tenants were engaged initially in low-end OEM such as garment which gradually moved up to mid-end and high-end OEM in technology- and capital-intensive products by the mid 1990s. Subsequently, R&D and high-value ITC industries were added. The current focus industries include IC testing and packaging (Nantze EPZ), LCD modules (Kaohsiung EPZ), and opto-electronics (Taichung EPZ). Gauged by total corporate revenue in 2009 (US\$8.66 billion), the dominant sector in EPZs was electronic parts and components (64.2%) followed by non-metallic mineral products (8.8%) and computer, electronic and optical products (8.6%). Compared with science parks which require high R&D/sales ratios for entry and stay, EPZs are for more downstream manufacturing.

The EPZ Administration of MoEA, located in Kaohsiung, oversees eight EPZs in Central and

¹² The brochure of EPZ Administration says Kaohsiung EPZ was the first such park in the world but some MoEA officials in Taipei said it was not. The mission was unable to identify the first country to establish an EPZ.

Southern Taiwan. The total area of these zones is 532 ha, which includes Kaohsiung EPZ (72.4 ha) and Nantze EPZ (97.8 ha). Corporate revenues, investments and trade at EPZs have increased significantly over the decades. In 2010, total tenant companies were 456 in number producing NT\$380 billion in revenue and US\$19.2 billion in export (US\$10.12 billion) and import (US\$9.09 billion). As factors of success, EPZ Administration cited right timing, excellent location, perfect legal system, single contact window, excellent investment environment, skilled workers, and others.

About five years ago, EPZ Administration began to bridge and mediate industry-university linkage. The program consists of human exchange such as student internship and visiting professors as well as research cooperation for technology transfer and commercialization. EPZ Administration offers matching services, one-stop window and database for universities. Based on company needs, a student team led by a professor is to conduct joint R&D (as is actively done in Nanyang Polytechnic in Singapore). While such industry-university linkage was strong from the outset at HSP, this is a relatively recent policy drive at EPZs.

The mission visited the EPZ Administration office in Nantze EPZ and paid a factory visit to Taiwan Brother Industries, Ltd. Located in that EPZ which manufactured high-end personal-use sewing machines with artistic embroidery capability.

6. SME policy

Promotion of small and medium enterprises is the responsibility of SME Administration under MoEA. In 2010, the number of SMEs in Taiwan was 1.24 million, or 97.77% of all enterprises. The SME sector accounts for 76.7% of total employment, 29.8% of total sales, and 17.9% of total export. The number of start-up companies is 88,531 annually, amounting to 7.1% of total SMEs. For manufacturing, construction, mining and quarrying, SMEs are defined as establishments with less than NT\$80 million (US\$2.5 million) in paid-in capital or less than 200 persons. For service and commerce, they are establishments with less than NT\$100 million (US\$3.2 million) in paid-in capital or less than 100 persons. Micro businesses are defined as establishments with less than 5 persons for all sectors.

SME support is provided in three layers. The “award strategy” is adopted for top SMEs (1-3% of total) by which national, rising star and R&D awards are given. The “guidance strategy” is used for the middle layer (27-34%) where 11 guidance systems are available¹³. For the remainder of “foundation” SMEs (65-70%), the “grouping strategy” comprising of mutual cooperation, industry cluster, local cultural industry and financing programs is offered. SME Administration works closely with IDB, DOIT, Bureau of Foreign Trade and Department of Commerce, all under MoEA, to provide integrated support.

¹³ The guidance systems are managed by appropriate bureaus and departments of MoEA and consist of industrial safety, R&D, pollution prevention, production technology, marketing, management, finance, quality upgrading, information management, business start-up and incubation, and mutual assistance and collaboration.

SME Administration has five divisions corresponding to five task areas, which are Policy Planning, Management Consulting, Business start-up and Incubation, Information Technology, and Financing. Taiwan's SME service network consists of SME Administration headquarters with a one-stop service center in Taipei, two regional offices in Center and South, and 24 local service centers. SME Administration also cooperates with the National Association of SMEs and its 20 branches, the China Youth Career Development Association and its 21 branches, and 23 industrial associations and 24 chambers of commerce at central and municipal levels. SMEs located in industrial estates can receive services from zone administrations.

Financial support for SMEs is provided by the SME Development Fund and the National Development Fund. These funds are on-lent by commercial banks to SMEs and start-up companies. 15% of funding from the SME Development Fund goes through SME investment companies. Additionally, the SME Credit Guarantee Fund guarantees 80-90% of commercial bank loans to SMEs (which seems a very generous guarantee). The Incubation Fund Account and various official rewards given to excellent SMEs are additional facilitators of SME finance. These government measures are expected to pump-prime SME finance by private funds, capital markets and venture capital.

For management and technical support, SMEs are provided with classes, enterprise consultancy (which is connected to bank loans), technology and linkage. SME consultation service is given by private firms and individual consultants through open bidding for government procurement. Unlike Malaysia (or Thailand in the past), no government officials are SME consultants. SMEs receive consultation free of charge. However, if new investment or training becomes necessary, that must be financed by SMEs themselves. Among Taiwanese industrial experts, Japanese terms such as *kaizen* and *shindan* are not well known although standard productivity tools such as 5S and QCC are widely recognized and used.

One promotion measure of interest is the Taiwan One Town One Product (OTOP) program, adopted from Japan's One Village One Product movement, which aims to develop local specialty industries with township or city as units. Starting from 1989, SME Administration has supported local SMEs with management, design, packaging, technology, space arrangement, and so on; participation in exhibitions and training courses; and creation of publications, websites and Taiwan OTOP shops. A total of 96 featured towns have successfully generated their distinctive local products.

Attachment 1: Mission details

Attachment 2: Organizations/persons visited

Attachment 3: List of information collected

Mission Schedule (20- 26 Mar. 2011)

1. Mission Members

Kenicni Ohno	Professor, National Graduate Institute for Policy Studies (GRIPS), Tokyo, Japan
Sayoko Uesu*	Research Associate, National Graduate Institute for Policy Studies (GRIPS), Tokyo, Japan
Berihu Assefa Gebrehiwot	Researcher, National Graduate Institute for Policy Studies (GRIPS), Tokyo, Japan and Ethiopian Development Research Institute, Addis Ababa, Ethiopia
Nguyen Thi Xuan Thuy	Researcher, Vietnam Development Forum (VDF) / GRIPS-NEU Joint Research Project, Hanoi, Vietnam
Pham Thi Huyen	Researcher, Vietnam Development Forum (VDF) / GRIPS-NEU Joint Research Project, Hanoi, Vietnam

*Participated from 20 to 23 March only.

2. Mission Schedule

DATE			TIME	Location	ACTIVITY
1	20	Sun	AM		
			PM	Taipei	Arrival
2	21	Mon	AM	Taipei	Industrial Development Bureau, Ministry of Economic Affairs (IDB/MOEA)
			PM	Taipei	Taiwan Institute of Economic Research (TIER)
3	22	Tue	AM	Taipei	Prof. Tain-Jy Chen, College of Social Sciences, National Taiwan University
			PM	Taipei	Dr. Wan-Wen Chu, Research Fellow, Research Center for Humanities and Social Sciences, Academia Sinica
4	23	Wed	AM	Taipei	Department of Industrial Technology, Ministry of Economic Affairs, (DOIT/MOEA)
			AM	Taipei	Small and Medium Enterprise Administration, Ministry of Economic Affairs (SMEA/MOEA)
			PM	Taipei	Chung-Hua Institution for Economic Research (CIER)
5	24	Thu	AM	Hsinchu	Hsinchu Science Park Administration, National Science Council
			PM	Hsinchu	Industrial Technology Research Institute (ITRI) and ITRI College
6	25	Fri	AM	Kaohsiung	Export Processing Zone Administration, Ministry of Economic Affairs (EPZA/MOEA)
			AM	Kaohsiung	Taiwan Brother Industries Ltd.
			PM	Kaohsiung	Metal Industries Research and Development Centre (MIRDC)
7	26	Sat	AM	Kaohsiung	Departure

Note: Among the five mission members, Kenichi Ohno and Sayoko Uesu (GRIPS Development Forum); and Nguyen Thi Xuan Thuy and Pham Thi Huyen (Vietnam Development Forum) are the members of the JICA-commissioned study team.

Organizations/Persons Visited

Government and its Organizations

Organization	Name	Position
Industrial Development Bureau, Ministry of Economic Affairs	Hui-Ying Chen	Deputy Director, Industrial Policy Division
Export Processing Zone Administration, Ministry of Economic Affairs	Robert M.S. Jahn	Senior Specialist
	Han Wen Kuan	Chief of P.R. Office
	Kuan-Yu Huang	Office of Public Relations
Department of Industrial Technology, Ministry of Economic Affairs	Hao-Chu Lin	Section Chief, Department of Industrial Technology
	Edie Chin An Wang	Business Manager, International Business Center, ITRI
Small and Medium Enterprise Administration, Ministry of Economic Affairs	Chen-Tsair Cheng	Deputy Director General
	Pu-Yun Long	Commercial Secretary, Business Startup and Incubation Division
	Chia-Hsien Yang	Section Chief, Business Startup and Incubation Division
Hsinchu Science Park Administration, National Science Council	Susan S. Chen	Deputy Director, Investment Services Division
	Tuan, Ssu-Heng	Section Chief, Investment Services Division
	Grace Chen	Investment Services Division

Research Institutes / Universities

Organization	Name	Position
Taiwan Institute of Economic Research (TIER)	Sung Min-Te	Director, Secretariat of Industrial Development Advisory Council
	Gary Chen	Public Relations Officer, International Affairs Specialist
	Liu Yau-Jr	Project Principal and Associate Research Fellow, Research Division II
National Taiwan University	Tain-Jy Chen	Professor, Department of Economics
Metal Industries Research and Development Centre	Paul Chung	Vice President
	Judy C.Lo	Project Manager, IP & Innovalue Section, Planning & Promotion Dept.
	Louis Hung-Lu Yen	Project Manager, IP & Innovalue Section, Planning & Promotion Dept.
	Charles Chen	Project Manger, Industrial Research Section, Planning & Promotion Dept.
	Ethel Cheng	IP & Innovalue Section, Planning & Promotion Dept.
Industrial Technology Research Institute (ITRI)	Shing-Yuan Tsai	Vice President and Executive Director
	Ho, Kwun-Yao	Deputy Representative of Tokyo Office
ITRI College	Feng-Kwei Wang	Executive Director
Academia Sinica	Wan-Wen Chu	Research Fellow, Research Center for Humanities and Social Sciences
Chung-Hua Institution for Economic Research (CIER)	Jiann-Chyuan Wang	Research Fellow and Vice President
	Hui-Lin Wu	Research Fellow, Division of Taiwan Economy
	Tsung-Che Wei	Assistant Research Fellow, Division of Taiwan Economy
	Hsien-Yang Su	Research Fellow, International Division/Director, Japan Center

Company

Organization	Name	Position
Taiwan Brother Industries Ltd.	Morinaga Tadashi	Representative Director & General Manager
	Da Shi Kong	Manager, VM Promotion Department

List of Information Collected

Source	Title	Authors / Publishers
Industrial Development Bureau, Ministry of Economic Affairs (IDB/MOEA)	PPT: Industrial Development in Taiwan, R.O.C, 2011	IDB/MOEA
	Industrial Development in Taiwan R.O.C. 2010	
Taiwan Institute of Economic Research (TIER)	Leaflet/Pamphlet: Taiwan Institute of Economic Research	TIER
	PPT: Taiwanese Economic Development	Ming-Te Sun, TIER
Department of Industrial Technology, Ministry of Economic Affairs (DOIT/MOEA)	PPT: Industrial Technology Innovation (Date: 2011.3.23)	DOIT/MOEA
	Leaflet/Pamphlet: 2010/2011 Department of Industrial Technology	
Small and Medium Enterprise Administration, Ministry of Economic Affairs (SMEA/MOEA)	Small and Medium Enterprise Development in Taiwan, ROC	SMEA/MOEA
	PPT: SME Development and Policy Measures in Taiwan, March 2011	
	Taiwan One Town One Product, Taiwan Local Cultural Industries Map	
	DVD: Building Industries from Creative Ideas	
	Incubation Centers 2010	
	White Paper on Small and Medium Enterprises in Taiwan, 2010	National Association of Small & Medium Enterprises
	Annual Report 2009	
Chung-Hua Institution for Economic Research (CIER)	Unbiased, Independent and Transcendent, National Policy Think-Tank	CIER
	Figures: The system of technology development in Taiwan/ The division of labor for technology development in Taiwan	Dr. Wang, CIER
Hsinchu Science Park	Discovering the Beauty of the Hsinchu Science Park, A Compilation for the 30th Anniversary of the Hsinchu Science Park	Science Park Administration
	Innovation for a better tomorrow	
	Investment Guide	
	Map of Hsinchu Science Park	
	PPT: Welcome to the Hsinchu Science Park	
Industrial Technology Research Institute (ITRI)	PPT: ITRI/Industrial Development /Government Policy	Shing-Yuan Tsai, ITRI
	Annual Report 2009	ITRI
	Innovative Technologies for a Better Future	
ITRI College	Program Overview	ITRI College
Export Processing Zone Administration, Ministry of Economic Affairs (EPZA/MOEA)	Historical Gallery Guide	EPZA/MOEA
	Transforming for the Global Economy, An Investment Guide to Export Processing Zones in Taiwan	
	EPZ Statistics at a glance	
	PPT: Export Processing Zone: An Overview	Victoria Kuan-Yu Huang, EPZA/ MOEA
	"Taiwan's Export-Processing Zones: Shifting Roles through the Decades", Taiwan Business Topics (December 2010)	Steven Crook
Metal Industries Research and Development Centre (MIRDC)	Pamphlet: Metal Industries Research and Development Centre	MIRDC
	CV of Dr. Paul C.K.Chung	
	PPT: A Brief Introduction of MIRDC, March 25, 2010	