

## Chapter 19

### TELECOMMUNICATIONS IN CHINESE TAIPEI

Roy Chun Lee<sup>1</sup>

- A liberalisation program began in Chinese Taipei in 1997, first in mobile then in fixed-line services. The subsequent change in performance was remarkable in comparison with other APEC member economies.
- Fixed-line, mobile and broadband service penetration significantly improved over the last two decades, while price has been decreasing rapidly over the same period.
- Some access charges for mobile services fell to zero in 2004, after the introduction of 3G mobile services: this pricing model facilitates access to services, while suppliers recoup costs through use charges.

#### 19.1 INTRODUCTION

The structural reform of Chinese Taipei's telecommunications sector is a recent development. Entry was prohibited prior to 1996. The integrated and monopolist incumbent was an administrative branch of the government, which was at the same time the regulator.

Until 1987 the Directorate General of Telecommunications (DGT) of the Ministry of Communications and Transport enjoyed a statutory monopoly under the Telecommunications Act of 1978 on all telecommunications services and equipment supplies in Chinese Taipei. Any party other than the DGT that provided services or apparatus faced administrative penalties enforced by the DGT.

While paging and other value-added services had been liberalised earlier, in 1996 the government passed three major pieces of legislation – the Telecommunications Act, the Organization Act of Directorate of Telecommunications and the Organization Act of the Chung-Hwa Telecom (CHT) Co. Through this legislation, structural reform began in the telecommunications sector. The legislation underpinned the introduction of structural reform through the separation of service provision from the public sector and the creation of licensing regimes that allowed the entry of private telecommunications operators.

Specifically, the Telecommunications Act mandated that service provision be separated from the DGT and transferred to the newly established CHT. In the lead up to market liberalisation, the Act created a licensing regime by defining the legal relationship between the regulator and operators in the new multi-player context. A pro-competition regulatory regime, consistent with the WTO Reference Paper on Basic Telecommunications, (hereinafter WTO Reference Paper) was also created to promote competition post market opening.<sup>2</sup>

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<sup>1</sup> Associate Research Fellow, Taiwan WTO Center, CIER (roy.lee@cier.edu.tw).

<sup>2</sup> Chinese Taipei undertook the obligations contained in the reference paper as an additional commitment in its WTO Schedule of Commitments (GATS/SC/136/Rev.1, July 2002).

According to the government's Liberalization Policy White Paper (1997), the objectives of the structural reform effort were to 'promote fair competition', 'remove barriers to new technologies' and 'improve operational efficiency'. The White Paper also specified a timetable for subsequent liberalisation initiatives, beginning with second-generation (2G) mobile services open to competition in 1997 and fixed-line operation in 2001. The sequence of liberalisation will be discussed in Section 19.2.

The timetable was influenced by external pressures and considerations. Chinese Taipei was at that time negotiating its WTO accession with major trading partners, including the USA and the European Union, who requested a clear market opening time schedule.

According to Chinese Taipei's privatisation law, the incumbent operator CHT was considered a privatised company (i.e., with the government's shares below 50%) in 2005 – 4 years after the liberalisation of the fixed-line market. The privatisation process faced little resistance from unions, as market competition was sufficient for CHT to be free from the constraints applicable to public sector institutions. The government, however, remained the single largest share holder of the company (around 34% of total equity), with controlling power over the appointment of the directors and senior management positions. This makes the CHT essentially still a government-controlled operator.

Recent developments include the creation of a new and independent regulator, the National Communications Commission (NCC), in 2006. The NCC is responsible for regulating both the telecommunications and broadcasting sectors. Table 19.1 provides a chronicle snapshot of major policy milestones in Chinese Taipei's telecommunications structural reform process.

**Table 19.1: Sequence of telecommunications reforms in Chinese Taipei, pre-1996–2008.**

Reform initiative	Pre 1996	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Paging service liberalised														
Basic telecommunications legislation														
2G mobile market licensed														
Fixed-line market liberalised														
3G mobile market liberalised														
Acceded to the WTO														
Incumbent operator privatised														
Converged regulator (telecommunications + broadcasting) established														
Wireless broadband access (Wimax) licensed														

Source: NCC 2009.

Note: The basic legislation, the Telecommunications Act, established the pro-competition regulatory regime; the Organizational Act, the independent regulator; and the Incorporation Act, the incumbent operator.

## 19.2 LICENSING REGIME AND MARKET STRUCTURE

### 19.2.1 Licensing regime

In accordance with the Act, every telecommunications operator in Chinese Taipei, regardless of the nature of the service it provides, must be licensed. Apart from defining the rights and obligations of service providers, this gives the regulator the opportunity to use the licensing regime as an instrument to 'manage' a desired market structure by controlling the sequence and number of licences to be issued.

The licensing approach for fixed-line Type I operations in Chinese Taipei best demonstrates how the licensing regime was used to assist a smooth transition to competition (DGT 1997). From 1997 Type II operations in Chinese Taipei were authorised through a general licensing system, that is, a licence would be issued to all qualified applicants who met a general set of technical and consumer protection requirements, with no limitation on the number of licences (except ‘special’ Type II services, which were liberalised in 2001) (Table 19.2).

**Table 19.2: Comparison of the market opening timetable and restrictions.**

Licensing category	Opening timetable	Type of licensing	Numerical restrictions
Type I – full-service fixed-line operation	1st round: 1999 2nd round: 2004 Since 2008: application is open throughout the year.	Franchise	1st round: Yes 2nd round: No Since 2008: No
Type I – individual services fixed-line operation	2004 Since 2008: no restriction	Franchise	1st round: Yes 2nd round: No Since 2008: No
Type I mobile operation	GSM: 1997 3G: 2003	Franchise	No: based on spectrum availability
Type I Wireless broadband access (Wimax) operation	2008	Franchise	No: based on spectrum availability
Type II operation	1997	General authorisation	No
Type II ‘special’ operation (e.g., VoIP that requires number allocation)	2001	General authorisation	No

Source: NCC 2009.

The Type I mobile service was liberalised in 1997 with the issuing of four nationwide and two regional GSM (2G) mobile licences. However, mergers and acquisitions led to only three GSM operators being left by the end of 2008, all of them declared Significant Market Players (SMPs). In 2002 3G operations were licensed with the issuing of five licences. Entry was now limited only by the availability of radio spectrum assigned to mobile operations.

The issuing of fixed-line Type I licences did not take place until 2001, when three full-service fixed-line licences were granted. In the initial stage there were seven consortia competing for this pre-determined limited number of new licences. As a result, an assessment based on technical innovation, financial capacity and past experience had to be held. The numerical restriction on fixed-line licences was removed from 2008.

Type I licences are issued by the regulator in conjunction with a concession franchise, a privilege granted by the government as opposed to a *de jure* right that Type II applicants are entitled to.

The Telecommunications Act specifies two categories of telecommunications operations, namely, Type I telecommunications enterprises (Type I) and Type II telecommunications enterprises (Type II) (Table 2.3). Type I operations are network-based operators that install telecommunications network facilities in order to provide telecommunications services. Type II operations are telecommunications enterprises other than Type I telecommunications enterprises (Telecommunications Act, ss. 1 and 2 and §11), that is, those that do not own physical network facilities. Another feature of this facility and non-facility dichotomy is the integration of voice telephony services with facility-based operations.

**Table 19.3: Telecommunications service classification systems in Chinese Taipei.**

Carrier categories	Designated service provisions	Types of licensing
Type I (facility-based)	Voice telephony and data transmission	Full service licence Individual service licence <sup>a</sup> Mobile licence
Type II (service-based)	None except Special Type II services	Type II Special Type II: voice resale, Internet telephony and mobile voice resale

Note: <sup>a</sup> individual service licensees can only operate through the provision of either local, domestic long distance or international services.

The service categories reserved exclusively for Type I fixed-line businesses are, in addition to their network leasing service, voice telephony connections between local, domestic, long distance and international destinations. These service categories are set out in the Regulations Governing Fixed Network Telecommunications Businesses (the Fixed Network Regulations), which is an administrative rule authorised by the Act. Operations in each of these telephony service categories, except for the holder of a full-service licence, require separate licences. For Type I mobile operations, the service provision includes both nationwide mobile telephony and data services.

In contrast, Type II operations do not have a pre-determined set of service categories other than voice-related operations. Voice service operators that do not own network facilities, including simple voice resale, VoIP, international telephony through leased international circuit and virtual mobile network operations (VMNO), are classified as Special Type II operators and they must apply for Special Type II licences.

In accordance with the Fixed Network Regulations, the regulator has the discretion to add other services to the list of Special Type II services as it deems appropriate. VMNO is the provision of a mobile voice telephony service by purchasing spare spectrum and network facility capacity from Type I mobile operators. It is the mobile analogue of voice resale.

It should be noted that no additional licence is required in order for Type I operators to provide Type II services.

In addition, Chinese Taipei adopts an asymmetric regulatory approach, whereby a Type I licensee classified as a SMP incurs additional burdens, especially with regard to price setting, interconnection and facility-sharing obligations. The qualification of SMP, as stipulated in the Administrative Regulation Governing Tariffs of Type I Telecom Enterprises, is judged by three criteria:

- a market share threshold measured in terms of either sale value or subscription rate that exceeds 25% of the relevant service market;
- dominant power over the market price; and
- the control of essential telecommunications facilities.

Currently the regulator has declared the incumbent CHT as the SMP in both Type I fixed-line and mobile operations. Interestingly, two new entrants in the mobile service market, Taiwan Mobile and FarEast Tone (FET), were also declared as SMPs for Type I mobile operations from 2007, making all 2G mobile operators SMPs. The consequence is that if all operators in a particular market are SMPs, the original intention of the Telecom Act to apply regulations asymmetrically to SMPs and non-SMPs becomes meaningless. The loosely defined qualification for SMP has been criticised for this peculiar outcome (Lee 2010).

### 19.2.2 Market structure

The full market entry liberalisation policy facilitated the issuing of a total of 109 Type I (facility-based) and 495 Type II (service-based) licences at the end of 2009. Yet Chinese Taipei's fixed-line and mobile markets remain concentrated. As at 2009, there were four integrated fixed-line service operators in Chinese Taipei: CHT, Taiwan Fixed Line Communications, Asia Pacific Telecom and Sparq Telecom. Nonetheless, as reflected in Chinese Taipei's experience, regulating market dominance to foster competition is not an easy task. Notwithstanding the introduction of pro-competition regulatory measures discussed below, the incumbent operator CHT still dominates the fixed-line market (Figure 19.1). It is especially worth noting that CHT enjoys a market share exceeding 97% for local telephony services. Further, dominance in a local telephony market often provides the operator with an advantage in the provision of broadband access services such as ADSL and fibre-based access services, and this is the case for Chinese Taipei, where CHT accounts for 83.8% of market share for the fixed broadband (including cable modem) market (CHT 2008). Evidence suggests that the policy enabling access to local loops is not delivering its intended objective, and is hindering the broadband development (see discussion in Section 19.4).

The mobile market is more competitive where the market shares of operators are less unequal compared to those in fixed-line services, with CHT sharing a similar market share with two primary competitors (Taiwan Mobile and FET) for both 2G and 3G markets (Figure 19.2). Reasons for this development are most likely related to the network deployment cost, network scalability, market demand for a mobile network vis-à-vis fixed-line and a relative lack of 'bottlenecks'.

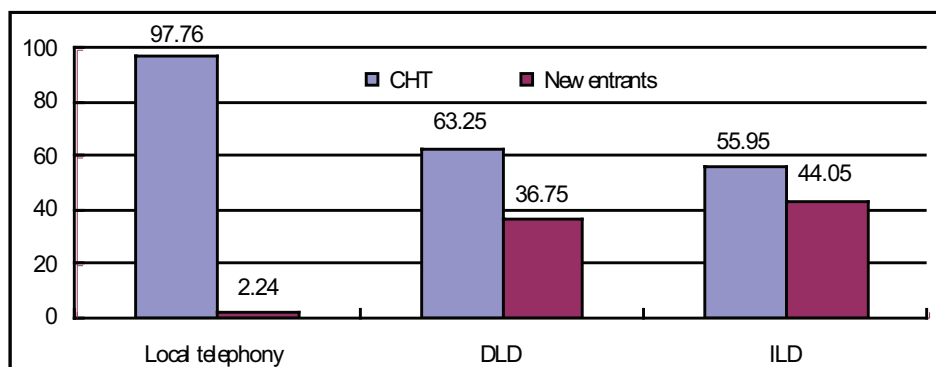


Figure 19.1: Market share in Chinese Taipei's fixed-line market, 2009 (% of total subscribers). (Source: NCC 2009)

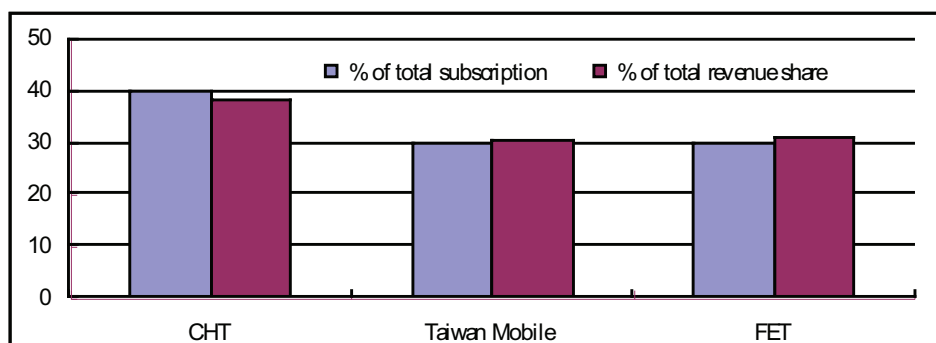


Figure 19.2: Market share in Chinese Taipei's mobile market, 2009 (% of total subscribers). (Source: NCC 2009)

## 19.3 PRO-COMPETITION REGULATIONS

### 19.3.1 Interconnection regime

As prescribed in the Telecommunications Act and the Regulations Governing Network Interconnection among Telecommunications Enterprises (hereinafter called the Interconnection Rules), the interconnection and access regulations in Chinese Taipei follow the principle of transparency, reasonableness and non-discrimination. All facility-based Type I operators are mandated, upon request, to interconnect with each other, either directly or indirectly through transit arrangements with third parties (Telecommunications Act, §16, para. 1). The regime also adopts an asymmetric approach that places additional requirements on the SMP to unbundle its network elements, adopt cost-based pricing and share certain essential network facilities with competitors.

In all cases, an interconnection agreement is deemed to be a commercial contract. All terms and conditions, including the point of interconnection (POI) and tariff, are subject to bilateral negotiation (the Interconnection Rules, §7 and §14). The regulator is not in a position to intervene for mediation and arbitration unless operators fail to reach agreement within 3 months from the date of the initial request. Even if the agreement is treated as a private contract, it is still required to observe certain provisions. These include requirements that agreement on the terms and quality of an interconnection should be non-discriminatory and that information exchanged between carriers to facilitate the interconnection of networks should be considered proprietary, and thus confidential. In the draft amendment of the Interconnection Rules published by the DGT in mid 2005, interconnection tariffs between non-dominating operators are also required to follow a cost-based and non-discriminatory approach.

Regulations for an interconnection agreement involving a SMP are different, and the POI is not the subject of negotiation. The Interconnection Rules prescribe a list of POIs where a dominating operator is obliged to offer interconnection with competitors upon request. The dominating operator is mandated to unbundle its network into trunk, local and switching components. The interconnection tariff must be calculated separately based on a Total Element Long Run Incremental Cost (TELRIC) pricing formula set forth by the regulator. In accordance with the Interconnection Rules (§2), TELRIC refers to the long run forward-looking cost added to telecommunications enterprises for making use of equipment; its functions are related, directly or indirectly, to unbundled network elements in order to offer network interconnections.

The final tariff is subject to approval by the regulator. The dominating operator must disclose the formula and method used in calculating the tariff. Also, the interconnection agreements between a dominating operator and other operators must be made publicly available as a reference for subsequent negotiations (articles 16 and 26 of the Interconnection rules).

Prior to 2003, the interconnection regime in Chinese Taipei did not extend to Type II operators. Interconnection between Type I and Type II operators is viewed as a private issue and arranged by commercial negotiation. A series of disputes have arisen since the liberalisation of voice-based Type II service provisions in 2001. These prompted the regulator to amend the Telecommunications Act and the Interconnection Rules in 2003 to include voice-based Special Type II operations under the interconnection regime.

The application of the interconnection regulations between Type I and Type II interconnections is rather limited; it only imposes the duty to provide interconnection with a regulatory arbitration when parties fail to reach consent within 3 months. As there is no requirement for cost-based pricing for interconnection between Type I and Type II operators, the regulatory arbitration mechanism will not be able to set the interconnection tariff for any interconnection disputes. This feature consequently constrains the capacity of the regulatory arbitration to settle interconnection disputes.<sup>3</sup>

Current regulation on interconnection tariffs (i.e., termination charges) in Chinese Taipei has been focused on its role in facilitating competition. Only the interconnection tariff set by the SMP is required to be cost-based and subject to regulatory approval. The application of the regulated tariff must also be non-discriminatory, so that it is applicable to all interconnection seekers.

The DGT amended the Interconnection Rules in 2005 to introduce cost-based and non-discriminatory rules for the calculation of interconnection tariffs across all operator categories. Yet given the bilateral contract nature of interconnection agreements between non-dominating operators, non-discriminatory rules would only be 'on paper' where there is a dispute and parties seek regulatory arbitration. This is because current rules do not require non-dominating operators to disclose their individual interconnection agreements and thus new negotiations cannot draw reference from the tariffs as well as terms and conditions agreed previously. Without this basis for comparison, it would be difficult for the negotiating party and regulator to assess if price and non-price conditions in a later agreement were non-discriminatory. Still, between 2006 and 2008 the regulator intervened to assist the establishment of 48 co-location sites.

Another unique feature of the interconnection tariff regulation in Chinese Taipei is that the access charge between mobile and fixed-line networks are decided by the mobile operator, regardless of which network originates the call. This arrangement departs from a common observation made by other regulators and the literature (Armstrong 2002; Albon & York 2004); they point out that, due to the lack of substitutes, a mobile operator enjoys a termination monopoly over calls made to its subscribers. This provides the opportunity and incentive for a mobile operator to set an access price that is above the competitive level. As such, there are several likely anti-competitive effects in Chinese Taipei's approach to regulating the fixed-line to mobile access charges. Firstly, pricing is not cost-based because interconnection tariffs are determined unilaterally by the mobile operators instead of bilaterally negotiated: this means, at the least, that the cost of the fixed-line partner in an interconnection relationship is not taken into consideration. In practice, all mobile operators in Chinese Taipei have set fixed-line to mobile access charges almost identical to each other through regulator-assisted group negotiations.<sup>4</sup> Secondly, this structure encourages the mobile operators to set the access charge above the competitive level without the need to worry about losing subscribers. Overall, this structure virtually implies that the fixed-line operator is subsidising mobile operators. With mobile market already out-performing the fixed-line market in recent years, this structure is increasingly unsustainable.

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<sup>3</sup> In addition to the interconnection agreement, fixed-line SMP (i.e., CHT) is offering other whole services (e.g., leased line) to other Type I and II operators at tariffs regulated by the NCC.

<sup>4</sup> See the regulator-approved fixed-to-mobile tariff at <http://www.cht.com.tw/PersonalCat.php?Module=Fee,Describe&CatID=113&PageID=1694> (accessed on 17 August 2010).

For these reasons, the NCC announced in 2008 its plan to cease this arrangement in 2011. While retail tariff for a fixed-to-mobile call is still set by mobile operators, the NCC has introduced a 'make-up' component in the NCC-approved fixed-to-mobile access charge formula to minimise the subsidising effect.

### 19.3.2 Access to essential facilities

The regulatory survey undertaken in this report finds that 13 of the 21 APEC members have, in varying forms, mandatory third-party access provisions (i.e., regulations that mandate a major supplier to offer access to essential facilities).

One of Chinese Taipei's third party access regulations assists new entrants to build their own networks by providing access to right-of-way. The regulator has declared a range of physical locations that are considered 'right-of-way bottlenecks', and the holder of right-of-way (i.e., the incumbent) is required to share these locations with competitors. These include public bridges, public tunnels, main access pipelines, distribution frame rooms as well as telecommunications pipelines in multi-complex buildings.

A 'Local Loop Unbundling' (LLU) rule has emerged as a popular arrangement to foster both competition and broadband development (OECD 2003a). Specifically, an LLU rule consists of two requirements: a dominating and vertically integrated operator is required to unbundle formerly integrated network components in local access into separate elements, and the dominant operator has to render access to its unbundled network elements to access seekers at a reasonable and non-discriminatory price and non-price terms and conditions.

In ensuring this is achieved, an access provider's individual or reference access undertakings are subject to regulatory approval in some economies (e.g., Australia), while others (e.g., Chinese Taipei) adopt a regulatory arbitration approach so that the regulator only intervenes when a commercial leasing negotiation has failed to reach agreement. In essence, an LLU rule offers two categories of open access to the local loop.

The open access regime in Chinese Taipei in essence imposes a duty on a SMP to share certain network elements in the local loop with rivals. These network elements have to be unbundled so that an access seeker can lease only the elements that are required. The Telecommunications Act stipulates that a SMP cannot refuse a request for leasing a network component by other Type I telecommunications enterprises without due cause. In addition, the Interconnection Rules in Chinese Taipei require that the local loop be further unbundled between the subscriber lines, local switching facilities and trunk network between local switching offices.

The Telecommunications Act does not, however, provide authorisation for the regulator to determine access tariffs and the pricing model. The only exceptions are in a limited list of network facilities that were declared to be 'bottlenecks' (§37) for which leasing tariffs had to be cost based. In 2006 the twisted-pair local loop was added to the list and in 2009 other elements were added: public bridges, public tunnels and main access pipelines, distribution frame rooms, in-building telecommunications pipelines in multi-complex buildings and local access networks. Of note is that all bottleneck facilities are related to fixed-line operations, as there have been no bottleneck facilities declared for mobile operations.

Despite frequent requests from access seekers since the LLU policy was introduced in 2006, it is not functioning as expected. This appears to be mainly because parties have failed to agree on the level of unbundling, the services that can be provided over the unbundled local



loop and, most importantly, the tariffs for leasing network elements. New entrants have reported that, as of 2009, little more than 200 lines have been leased by new entrants.<sup>5</sup>

### 19.3.3 Universal service obligations

Teledensity in Chinese Taipei reached 171% per household at the end of 2008 (CHT 2009), which reflects the fact that network coverage is almost universal. This is perhaps the result of past policy before market liberalisation which demanded that the state-owned incumbent provide voice services upon request to all citizens at a uniform and affordable price. Traditionally, any deficit incurred by the incumbent in implementing this policy was compensated by a direct state budget or cross-subsidy from long distance and international services (DGT 1997).

The prohibition of cross-subsidies, in tandem with the increased level of competition in the subsidising service markets post liberalisation, significantly limited the incumbent's ability to recover losses in undertaking the universal service obligation. It was in this capacity that the then current USA regime emerged to establish an industry-wide universal service funding scheme levied on all eligible telecommunications operators.

The Regulation on Telecommunication Universal Services (hereinafter called the Universal Service Rules) in Chinese Taipei defines 'universal services' as the provision of 'indispensable telecommunications services with a reasonable level of quality provided fairly and at reasonable rates for all citizens'. Currently services considered 'indispensable' include voice telephony and data communications. Specifically, the scope of services set out in the Universal Service Rules (USR) include both uneconomic public payphone services, telephone services in uneconomical areas provided via a fixed-line PSTN and broadband Internet access to public schools and libraries at a subsidised price. The term 'uneconomic area' is defined as an area where the avoidable costs of the service provided to it by a local exchange office exceeds the amount of its revenue foregone.

The USR designate the fixed-line incumbent CHT to be the mandatory provider of universal local telephony services. The reason for this designation is straightforward: it is because CHT has the most extensive network coverage. Still, the USR provides the procedures for other local network to become a universal service provider. The amount of subsidy for providing voice telephony under the universal regime is determined by the difference between avoidable costs and the amount of revenues foregone. That is, the subsidy is estimated based on the costs the universal service provider can avoid, and what revenues it would consequently forego, if it were not required to provide services in areas that are deemed uneconomical.

The costs for providing universal services are then distributed and levied across all Type I and Special Type II operators in proportion to their respective annual turnovers. The Universal Service Rules, however, also adopt a threshold of financial eligibility based on market assessment, with only those operators having revenues in excess of TWD200 million required to make a contribution. According to the NCC's latest survey, in 2008 contributions levied from eligible operators in the USA based on that monetary threshold account for 98.4% of that economy's total costs for that year. Inevitably, larger operators have to bear the costs of the levies avoided by small and exempt operators. This is a common practice to

<sup>5</sup> In 2009 the NCC approved the monthly rental price per pair at TWD126, which is 10% lower than the 2007 price of TWD140. This is to encourage new entrant operators to rent LLU owned by SMP and to enhance the competition of ADSL in the fixed-line market. The effect is yet to be observed.

reduce both the possible financial impact on low turnover and new entrants and the cost of managing (by minimising auditing and verifying costs) the funding mechanism without substantially affecting the level of equity and competitive neutrality.

## 19.4 ASSESSMENT OF PERFORMANCE

### 19.4.1 Accessibility and price

The recent performance of Chinese Taipei's telecommunications sector has been remarkable in comparison with other APEC member economies. Measurements for major performance indicators, including fixed-line, mobile and broadband service penetration (defined as subscribers per 100 inhabitants), have been significantly refined over the last two decades, while price has been decreasing rapidly over the same period. The lack of competition in the fixed-line market, however, is likely to be responsible for undermining Chinese Taipei's broadband development.

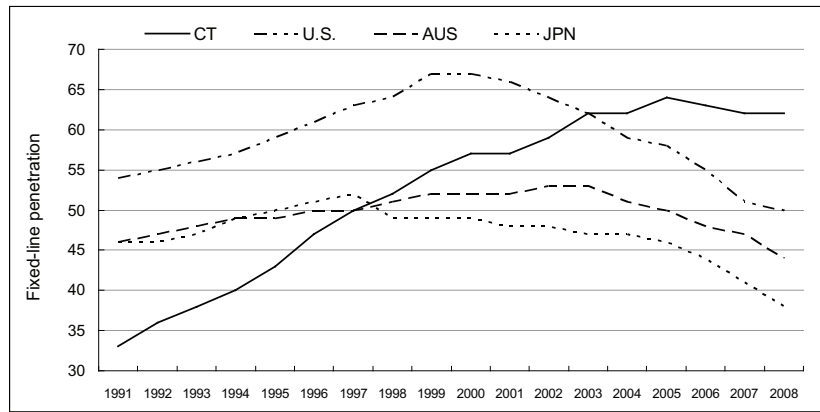
In terms of accessibility performance, fixed-line penetration in Chinese Taipei exceeded that of Australia and Japan in 1998 and of the USA in 2003 (all economies with much higher *per capita* GDPs: see Figure 19.3a). Broadband performance appears to be performing well vis-à-vis these comparator economies (Figure 19.3b). Mobile sector's performance is equally consistent that of fixed-line and broadband. As demonstrated in Figure 19.3c, a sharp increase in mobile penetration took place around 1998 when competitive 2G operators began, surpassing many pioneer economies in the region, such as the USA; Australia; and Japan. This trend of rapid development continued until it reached its saturation point in 2004. The entry of 3G mobile operators in 2003 is likely to be the reason for this rebound in penetration since 2005.

While mobile penetration in Chinese Taipei represents a direct link between structural reform and performance, the relationship between fixed-line and broadband performances in Chinese Taipei and structural reform is less straightforward. The steady upward improvement in fixed-line penetration occurred before the introduction of structural reform in 1996, and no significant change has occurred since the fixed-line market was liberalised in 2001. On other hand, Chinese Taipei, once an APEC forerunner in broadband accessibility, has been lagging behind in broadband access since 2004. As demonstrated in Figure 19.4, the relative level of refinement for broadband penetration in Chinese Taipei between 2004 and 2008 is significantly lower than that in some other developed APEC economies.

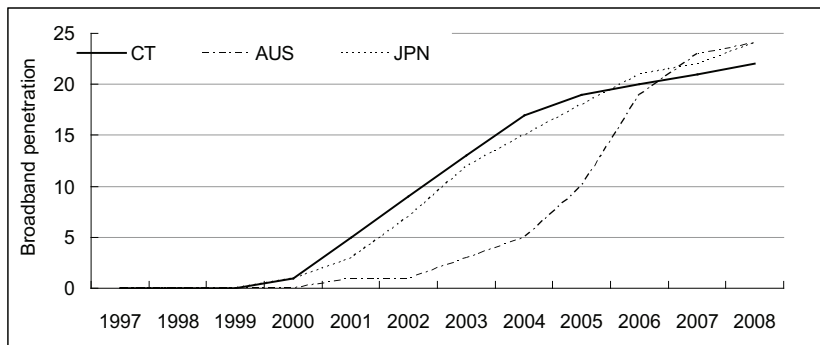
Lack of competition due to the dominance of the incumbent CHT in broadband access offers a possible explanation. In fact, the CHT has other potentially anti-competitive conducts that would reflect its strategy to deter competition. One of the recent examples was the bandwidth degradation incident between CHT and other Internet Service Providers (ISPs) in 2009. A dispute over internet interconnection charges took place between CHT and other major ISPs in mid 2009, with the latter requesting regulator's arbitration. It was reported that while the arbitration process was still on-going, CHT unilaterally degraded the interconnection bandwidth with other ISPs to 75% of its normal speed when other ISPs refused to provide deposits before the conclusion of the arbitration.<sup>6</sup> As CHT hosts the majority of Chinese Taipei's prime websites, the impact of bandwidth degradation was felt in essence only by CHT's competitors.<sup>7</sup>

<sup>6</sup> Report on United Daily News (21 May 2009) available at [www.mag.udn.com/mag/digital/storypage](http://www.mag.udn.com/mag/digital/storypage).

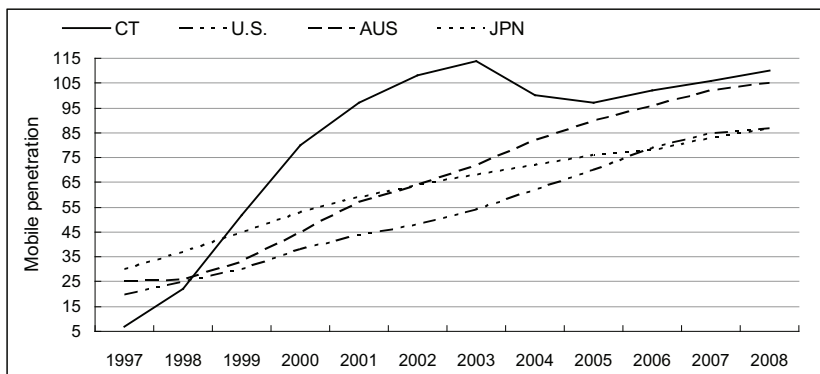
<sup>7</sup> The bandwidth was eventually resumed a week later after the regulator's intervention.



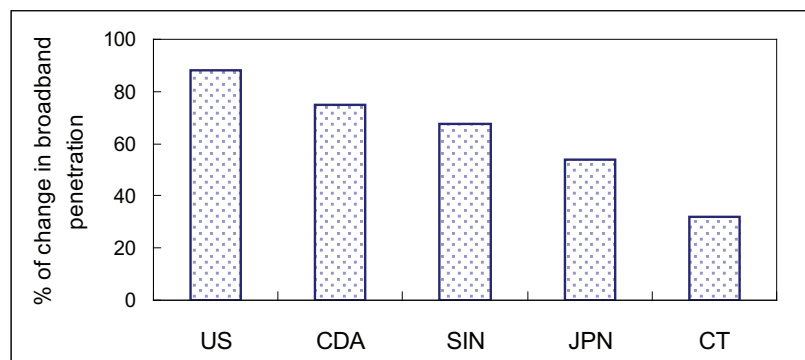
**Figure 19.3a: Fixed-line penetration rates in Chinese Taipei; the USA; Australia; and Japan, 1991–2008. (Source: ITU 2009).**



**Figure 19.3b: Broadband penetration rates in Chinese Taipei; Australia; and Japan, 1997–2008. (Source: ITU 2009).**



**Figure 19.3c: Mobile penetration rates in Chinese Taipei; the USA; Australia; and Japan, 1997–2008. (Source: ITU 2009).**



**Figure 19.4: Percentage of change in broadband penetration between 2004 and 2008 for five APEC members – the USA; Canada; Singapore; Japan; and Chinese Taipei. (Source: ITU 2009)**

Crémer et al. (2000) and Malueg and Schwartz (2001) have argued that bandwidth degradation can achieve the same anti-competitive outcome as pricing-based strategy. Chinese Taipei's competition law authority – the Fair Trade Commission (FTC), also issued a statement to express its concerns on the likelihood of CHT's degradation decision as abuse of market power.<sup>8</sup> Despite the swift resolution of the incident, it would possibly produce a chilling effect at least on future internet interconnection negotiations.

In relation to the change in price, performance in Chinese Taipei also demonstrates a positive relationship between structural reform and performance. A significant reduction for mobile service connection and monthly subscription charges, as well as the connection charge for fixed-line services, took place around the beginning of the structural reform. Of note is that, according to ITU (2009) data, the average connection and monthly subscription charges for mobile services reduced to zero since 2004 after the introduction of 3G mobile services (Figures 19.5a and b). Yet contrary to the ITU data, charging monthly subscription fees is still commonly practised in Chinese Taipei.<sup>9</sup>

Similar to the situation in Viet Nam (Chapter 20) mobile operators in Chinese Taipei waive connection fees with the view of achieving economies of scale. In addition, the level of competition was significantly increased after the entry of new 3G mobile operators, and new entrants often offer free subscription/connection fees, bundled plan with free handset and possibly free on-net calls to lure subscribers to switch operators. This strategy often prompts existing operators to follow suit.

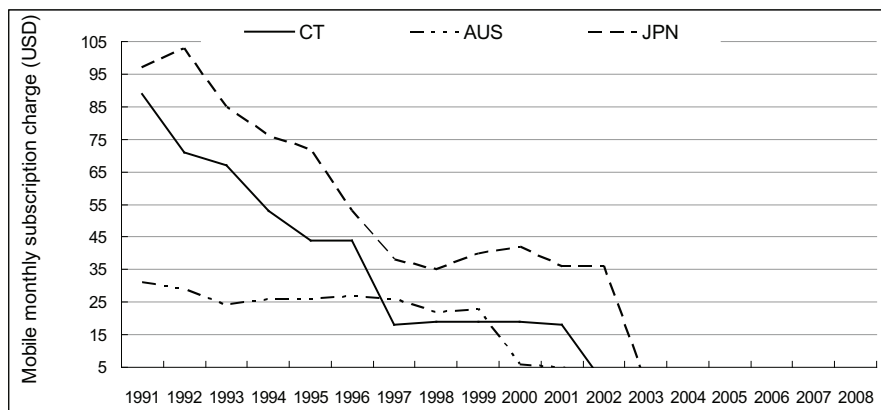


Figure 19.5a: Mobile service monthly subscription charge (USD). (Source: ITU 2009)

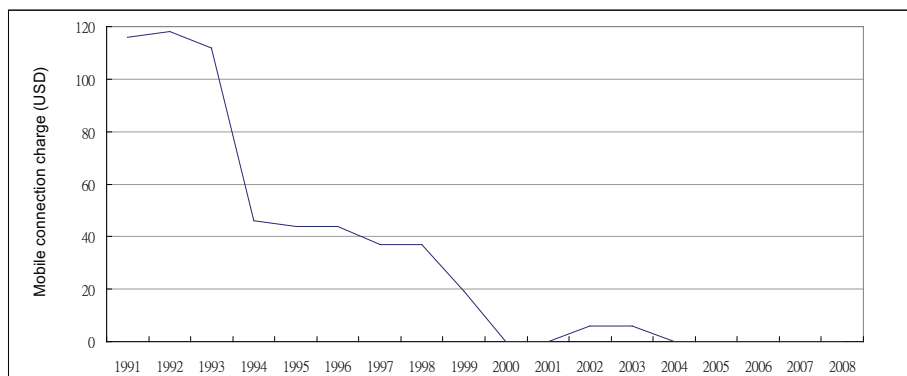


Figure 19.5b: Mobile service connection charge (USD). (Source: ITU 2009)

<sup>8</sup> [http://mag.udn.com/mag/digital/storypage.jsp?f\\_MAIN\\_ID=314&f\\_SUB\\_ID=2922&f\\_ART\\_ID=195391](http://mag.udn.com/mag/digital/storypage.jsp?f_MAIN_ID=314&f_SUB_ID=2922&f_ART_ID=195391)

<sup>9</sup> This observation comes from visiting mobile operator's websites (e.g., CHT's at [www.cht.com.tw](http://www.cht.com.tw)).

### **19.4.2 Quantitative assessment**

In this section, we report on the results of independent research commissioned by Chinese Taipei's telecommunications regulator (which was still the DGT at the time of commissioning) on the impact of liberalisation on efficiency. The report (CIER 2003) aimed to explore efficiency gains at both macro and micro levels.

At a micro level the research examined production efficiency and the total consumer surplus due to price reduction. Using the Data Envelopment Analysis (DEA) methodology in measuring production efficiency, the research found that four out of a total of six mobile services operators in Chinese Taipei enjoyed a technical efficiency value at 1, representing 100% utilisation of input. But most mobile operators failed to reach scale efficiency. On the consumer surplus estimation, the report concluded that between 1998 and 2003 the total consumer surplus reached TWD222.4 billion (USD71.1 billion at the 2010 exchange rate) due to a reduction in the mobile retail price. For the international long distance service, the consumer surplus stemming from the price reduction was TWD23.69 billion (USD0.76 million) (CIER 2003).

At the same time, the report found that the spillover benefit of telecommunications liberalisation in Chinese Taipei also went to the telecommunications system and terminal equipment manufacturing sector and the computer and information system management sector, as well as to the advertising and distribution services.

For macroeconomic impact, the report estimated the impact of the telecommunications liberalisation policy with the Computable General Equilibrium model. It found that, on the assumption that efficiency would be improved through competition, telecommunications liberalisation policy in Chinese Taipei would increase 0.31% of the GDP (equivalent to TWD30.8 million) and TWD19.7 billion in consumer equivalent variation. That is, for every 1% improvement in efficiency, there would be TWD2 billion and TWD1.25 billion increases in GDP and consumer equivalent variations respectively. At the same time, the report observed that there was room for improvement in telecommunications service quality and tariffs through international benchmarking (CIER 2003).

## **19.5 FUTURE CHALLENGES**

Despite the remarkable performances discussed above, the telecommunications structural reform experiences in the APEC region and in Chinese Taipei suggest that policy challenges remain to be addressed. These challenges are likely to be common to most APEC economies.

### **19.5.1 Market dominance**

Market dominance plays a dual role in the characterisation and specification of regulatory treatment. The first role is dominance in the local loop. The local loop is considered to be a bottleneck for competition in a downstream market with a SMP, where the SMP has the ability and incentive to deter competition when it is itself competing in the same downstream market (Economides 2004). Although facility-based competition is allowed at policy level, ensuring third party access to an incumbent-dominated local access network is viewed as the preferred way to encourage entry, by lowering the risks and entry barriers at the initial stage of a market's opening.

Nonetheless, as reflected in Chinese Taipei's experience, regulating market dominance to foster competition is not an easy task. Despite the introduction of pro-competition regulatory

measures as discussed above, CHT still dominates the fixed-line market. Further, as demonstrated in the bandwidth degradation case discussed above, dominance in the local telephony market gives CHT the opportunity to leverage its dominance to the provision of broadband access services such as ADSL and fibre-based access services.

### 19.5.2 Convergence

Convergence refers to the development that, due to digitalisation and IP-based technologies, traditional market boundaries have been removed and both broadcasting and telecommunications are coming together. Convergence becomes a policy issue when regulatory regimes are not updated with technological and market development, thus becoming barriers instead of facilitators. It is becoming increasingly evident that new IP-enabled services that are, in most respects, 'like' services to their traditional counterparts, are not receiving non-discriminatory treatment.

For example, when CHT launched its IPTV service over the broadband telecommunications network in 2006, it could not apply for a cable TV system licence. This is because each cable TV system licensee in Chinese Taipei can only offer service in one specific 'servicing area';<sup>10</sup> there is thus no licensing category that meets the profile of CHT's nation-wide network coverage.<sup>11</sup>

Another example is the debate over the legal basis for the issuance of mobile TV licences. If mobile TV is defined as a digital free-to-air TV on a hand-held device, the Broadcasting Act would be applicable. Nevertheless, Chinese Taipei's Broadcasting Act prohibits foreign investment, and this would disqualify all existing mobile operators from participating as they all have foreign equity holding).<sup>12</sup>

### 19.5.3 Competitive safeguards

The WTO Reference Paper stipulates that appropriate measures shall be maintained to prevent major operators, alone or together, engaging in or continuing anti-competitive practices. Anti-competitive practices carried out by operators, in particular operators with market power, pose a major barrier to competition and trade. Regulating operators with market power in the telecommunications market has been widely discussed.

In light of communications convergence, issues of cross-sector anti-competition practices are surfacing that require further attention. For example, it has been reported that TV program distributors owned by cable TV operators in Chinese Taipei have refused to supply TV programs (or in some cases supply only inferior quality programs) to IPTV services offered by telecommunications operators. While most of the refusals are based on disagreement over price and non-price terms and conditions, some of the refusals have been argued by some to be with the intention to distort competition.<sup>13</sup> This indicates that the concept of 'bottleneck facilities' in communications convergence needs to be redefined to address both hardware and 'software' bottlenecks (ITU 2008).

<sup>10</sup> There are 52 'servicing areas' defined by Chinese Taipei's Cable TV Act.

<sup>11</sup> To resolve the issue, the regulator amended the 'Regulations Governing Fixed Network Telecommunications Business' and defined IPTV over telecommunications networks as 'telecom multimedia platform service' instead of a cable TV system service.

<sup>12</sup> This issue is still pending as at August 2010.

<sup>13</sup> Information collected through field interviews at file with the author.

Unfortunately, while competitive safeguard rules are included in the Telecommunications Act in Chinese Taipei, there is no similar regulation available for the cable TV or other broadcasting sectors. While there is a generic competition law to address possible anti-competition measures, its ex-post nature makes it less effective in regulating anti-competition measures in the broader communications sectors.

#### **19.5.4 Interconnection**

As discussed above, major issues in interconnection regulation in Chinese Taipei include non-disclosure interconnection agreements between non-dominating operators and the fixed-line to mobile termination charges. At the same time, with the development of next generation broadband networks, issues of interconnection arrangements for IP-based traffic have come to light. There are issues relating to costing methodologies. Also, Quality of Services (QoS) assurance across networks with differentiated transmission technologies and speed, for example, would be a challenge for regulators to avoid QoS 'Balkanisation' situations (where either an individual or each of a group of networks unilaterally adopts a set of QoS standards that apply only to 'on-net' services).

Three aspects of interconnection QoS in the IP-based environment are involved: standards and indicators of QoS; the technical performance required of a network to ensure that end-to-end performance standards are met; and the division of responsibility in meeting performance goals between interconnecting parties.

#### **19.5.5 Access to essential facilities**

As discussed, access to essential facilities, in particular the LLU policy, is not delivering its promised objective in fostering competition and broadband diffusion in Chinese Taipei. As at 2009 only a few more than 200 lines had been leased by new entrants and competition in the fixed-line market was limited by comparison with the mobile sector.

In light of the development in Chinese Taipei of a next generation broadband network, recent discussions have focused on mandatory infrastructure sharing as a new regulatory issue. Technically, as traditional copper wires are replaced by fibre-optical cable, substantial physical space will be freed from existing conduits and trenches that will enable sharing by competing operators who are in the process of next generation broadband network deployment. ITU (2008) categorises this type of infrastructure sharing as 'passive sharing' (which includes the sharing of non-electrical 'civil engineering' elements of the network and rights of way). ITU (2008) recognises that passive sharing is a critical approach in encouraging the development of next generation broadband network.

The scope of essential facilities needs to be revisited because of convergence. The provision of cross-sector communication services warrants that the essential aspects, in particular the availability of alternative elements that are able to carry out a similar set of services, need to be assessed from a much broader perspective beyond traditional sector boundaries.

#### **19.5.6 Universal service obligations**

Each WTO member should have the right to define the kind of universal service obligations it wishes to maintain. These obligations will not be regarded as anti-competitive *per se*, provided that they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the particular economy.

Traditional definitions of universal service focus on the provision of a set of pre-defined services, the most notable of which are voice telephony and data access. Communications convergence has significantly altered the pre-conditions of this traditional approach. As the scope of technologies to be included or omitted in a universal service scheme affects the cost, convergence indicates that what is required is technological neutrality that takes into account the viability of similar cross-networking services. The delivery modes for carrying out universal service obligations (however these are assigned) should not be confined by pre-determined technologies.

Such an approach would also help to identify the qualifications required to entitle operators to share the cost of providing universal service. Many economies tend to impose the universal service contribution onto a narrowly defined group of telecommunications operators, more specifically levying contributions from operators who provide voice telephony services via fixed-line or mobile networks. As an alternative, Sicker and Mindel (2002) and the OECD (2006) discussed the possibility of a contribution scheme based on telephony number assignment to ensure a more technology-neutral funding arrangement.

#### **19.5.7 Allocation and use of spectrum and scarce resources**

Any procedures for the allocation and use of scarce resources, including radio spectrum, numbers and rights of way, are important factors determining market accessing. The WTO Reference Paper requires that these procedures should be objective, timely, transparent and non-discriminatory and that the current state of allocated frequency bands should be made publicly available.

Emerging issues in this regard include the re-allocation and re-assignment of additional spectrums that are released after the digital terrestrial TV (DTV) switch over and the allocation and assignment of numbers to IP-based telephony services.



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