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**A Study of the Transformation and
Development of Telecommunications
Market and Competition Policy in the
Digital Economy Era in Taiwan**

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I. Introduction

Due to the nature of the telecommunications industry, such as economies of scale, network externalities, scarcity of spectrums, and bottleneck facilities, etc., the incumbent operators normally enjoy competitive advantages and become significant market powers in the telecommunications market. Therefore, most countries have imposed asymmetric regulations for the significant market powers to ensure the fair competitions between the incumbent operators and competitive operators.

With the development of technological convergence, new technologies and new services are constantly being introduced, and the communications market has undergone tremendous changes. As a result, the market segmentations between telecommunications and broadcasting services have become increasingly blurred. Accordingly, the traditional telecommunications and broadcasting regulations that regulate telecommunications and broadcasting services providers need to be adjusted in line with the technological convergence. The policy should be also adjusted in response to the change of environment driven by the development of digital communication technologies.

Hence, a revision of the Telecommunications Act, namely,

Telecommunications Management Act, has been passed by the Taiwanese government in 2019. The regulatory supervision has been changed from by the type of business to by the specific telecommunications service market. Accordingly, the related regulation for the identification and supervision of significant market power under the regulatory framework of Telecommunications Management Act will be needed to be revised.

This study firstly analyzes the development of telecommunications market and the asymmetric regulations of the significant market power (SMP) in telecommunications sector as well as related case studies of relevant market definitions and SMP identifications in advanced countries/area, including the European Union (EU), the United Kingdom, the United States, Japan, South Korea, and Australia. Secondly, this study analyzes the current regulations for SMP based on Telecommunications Act in Taiwan. Thirdly, based on the regulations of Telecommunications Management Act and the research findings of the SMP regulations in other countries, this study proposes the draft of SMP Guidelines and conducts the competitive analysis of telecommunications market in Taiwan, including the proposed delineation of relevant market, identification of SMP and proposed remedies imposed with SMP. In addition, the transition of the existing

Telecommunications Act and the new Telecommunications Management Act with regard to the obligations of telecommunications operators (including SMP) are discussed, and the impact analysis of the implement of Telecommunications Management Act is conducted. The major research findings will be summarized below.

II. SMP regulations in advanced countries

EU identifies the SMP through the mechanism of defining relevant markets and conducting a market analysis to identify the SMP in the relevant market. When the regulatory authority of each country in EU finds that there is SMP(s) existing in the market and concerns that the SMP(s) may exercise the market powers, the ex-ante regulations are implemented for significant market power players (ie SMPs), while other non-SMP players apply the ex-post regulations. In 2003, the European Commission released the commission recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation, and 18 markets were suggested. The 2007 version was reduced to 7 markets, and the 2014 version was further reduced to 4 markets. All of the above 4 markets are wholesale markets. The national authorities are

suggested to identify the relevant product markets and geographic markets first, and then conduct a market analysis to identify the SMP. EU suggested that the relevant markets subject to ex ante regulation must be passed a three-criteria test conducted by the national authorities. That is, the market exists high and non-transitory barriers to entry, the market does not have effective competition, and competition law itself fails to correct market failures. Accordingly, UK basically follow the recommendations suggested by the EU.

The United States distinguishes between dominant carriers and non-dominant carriers based on whether the carrier possesses market power, which refers to the ability to increase and maintain prices above the competitive level without losing too many customers and causing unprofitability.

Japan identifies the SMP based on the market share, with 50% for the operators of type I telecommunications business (i.e. for fixed network) and 10% for the operators of type II telecommunications business (for mobile network). The obligations imposed on Japan's SMP include interconnection regulations, price controls, and behavioral controls (for example, the principle of non-discrimination). Similar to Japan, Korea

identifies the SMP also based on the market share. The operator will be identified as the SMP with 50% of market share. If the first three big operations own the market share exceeding 75%, the companies will be identified as market dominating enterprisers (with the exception of the company with less than 10% of market share).

In Australia, ACCC can declare the “declared service” and decide the access determination for the declared service. The ex-ante regulations mainly apply to Telstra and NBN, but sometimes also include the non-Telstra operators.

III. Current SMP regulations in Taiwan

Currently, the SMP in Taiwan’s telecommunications market is regulated based on the Telecommunications Act. Based on the Article 26-1 of the Telecommunications Act, the SMP regulatory supervision is mainly to prevent anti-competitive behaviors conducted by the SMP. The measures include interconnection requirements, price control in terms of price cap or the method of price setting, and non-discrimination treatment to other competitive operators. In addition, the type I telecommunications enterprise which owns the essential facilities to be considered as the SMP,

and should open the access to other type I telecommunications enterprises which engage in the establishments of fixed network.

In addition, the “Administrative Regulation Governing Tariffs of Type I Telecommunications Enterprises” and “Regulations Governing Network Interconnection among Telecommunications Enterprises” mainly impose obligations of network interconnection and price control on SMP.

According to the “Administrative Regulation Governing Tariffs of Type I Telecommunications Enterprises”, the type I telecommunications enterprises will be identified as SMP if it meets one of the three criteria and has been announced by the authority. The three criteria refer to: (1) the operator controls the essential facilities; (2) the operator possesses a dominant power on market prices; and (3) the operator has a market share above 25% in terms of users or sales. In practice, the SMP is identified mainly based on the criterion of market share which is easily to be determined.

IV. The identification of SMP and market analysis under Telecommunications Management Act

1. Suggestions of SMP Identification and Supervision Guidelines

This study proposes a draft of “SMP Identification and Supervision Guidelines” (hereinafter referred to as “SMP Guidelines”).

It is suggested that the “SMP Guidelines” should include the factors for the delineation of specific telecommunications service market (in accordance with the Telecommunications Management Act), and the factors for the SMP identification. SMP identification should consider firstly the factor of market share. If the operator has a market share of more than 50%, it could be deemed as a SMP; if the operator has a market share of 40%, the authority should consider other factors to judge the existence of SMP. The other factors include the market structure, competitive advantages, countervailing buyer power, etc. These factors relate to the player’s market power to influence market prices or service conditions. In addition, if the operator owns or controls the essential facilities, it may be identified as a SMP.

Moreover, it is suggested that the “Guidelines” should include setting up the proper procedures of delineation of relevant market,

market analysis, SMP identification and remedies imposed on the SMP. In particular, in order to provide the SMP(s) and interested parties with an opportunity to express their opinions, the authority should conduct public consultation procedures on the draft of remedies proposed by the authority, for a cautious purpose.

2. Market analysis of the relevant markets

In accordance with above proposed “SMP Guidelines”, this study identifies eight specific telecommunications service markets and conducts market analysis for each market to identify the SMP, if any. The eight relevant markets include mobile retail service market, fixed voice retail service market, fixed broadband retail service market, mobile call termination market, fixed call origination and termination market, internet interconnection bandwidth market, wholesale fixed broadband and voice service market and fixed voice and broadband local access market.

The results of market analysis indicate that except for the mobile retail service market in which no SMP is found, other relevant markets are found that Chunghwa Telecom to be identified as the SMP in those relevant markets, and the suggested remedies imposed on the SMP are

proposed accordingly. The details of market analysis results and suggestions are described below.

(1) Mobile retail service market

The SMP Guidelines indicate that if the operator has a market share of 40%, the authority should consider other factors to evaluate whether there is a SMP in the market or not. The result shows that none of the mobile operators in the mobile retail service market has a market share exceeding 40%. In addition, a comprehensive analysis shows that although the entry barrier is high due to limited spectrum available for mobile operators, the mobile retail service market is competitive in view of the market structure (5 mobile operators) and preferential tariff schemes to customers. The users can easily switch to another mobile operator under the mobile number portable scheme at a fairly reasonable price, which indicates the existence of certain level of countervailing buyer power. Therefore, this research suggests that there is no need to implement ex-ante regulations in the mobile retail service market.

(2) Fixed voice retail service market

The total revenue of fixed voice retail service market has been

decreasing year by year, accounting for only about 10% of total telecommunications market revenue at present. The entry barrier is high because the infrastructure is difficult to duplicate; as a result, Chunghwa Telecom, the incumbent, has a market share of 93% in this market. Based on the SMP Guidelines, Chunghwa Telecom is considered as the SMP as its market share exceeding 50%. In addition, as the landline service is the universal service, in order to maintain the affordable price level of universal telecommunications services, it suggests that the authority maintain the price control to Chunghwa Telecom's fixed voice retail service.

(3) Fixed broadband retail circus market

Chunghwa Telecom's market share in the fixed broadband service has been about 66% in the past two years. Cable operators have actively attracted customers with lower rates or bundled services, and they have also achieved significant results in the past two years. However, Chunghwa Telecom offers the fixed broadband service with higher download / upload speed than that of the cable operators. Chunghwa Telecom is also actively marketing ADSL customers to upgrade to its fiber broadband service. Thus, Chunghwa Telecom is

still able to maintain higher prices under the competition of cable operators.

In view of the supply substitutes, mobile broadband service is the alternative for users to access the internet. In Taiwan, the 4G penetration rate is over 120% and the users enjoy a bargain of unlimited data plan due to intensive competitions in mobile market. It enhances the countervailing buyer power of end-users in the retail fixed broadband service market.

At present, the charges of fixed broadband service in retail market include circuit charge and internet service charge, of which internet service charge is not regulated, and circuit charge is controlled by X value by regulation. Although the circuit charge is paid directly by the consumer to Chunghwa Telecom, it should actually be regarded as the wholesale input that ISP (Internet Service Provider) operators need to purchase. Without it, the ISPs are unable to provide end-user fixed broadband services. It is then actually a wholesale service in nature to the ISP operators.

According to the SMP Guidelines, Chunghwa Telecom has a market share of more than 50% in the market, and is deemed to be an

SMP. In order to prevent the dominant players from abusing their market position, it is recommended that the authority maintain the current price control measures for fixed broadband retail circuits service market by X value.

(4) Mobile call termination market

Mobile termination rate is the charges that mobile operators levy on each other and on fixed network operators for terminating calls on the networks of mobile operators. Currently the mobile call termination rate (MTR) is regaled by the authority which adopted the total elements long-term incremental cost (TELRIC) model to calculate the access charge of MTR.

At present, there are five mobile network operators in Taiwan. Each operator is the only provider which provides the termination service to the retail subscribers using the mobile phone numbers of the mobile network operator. Therefore, each mobile operator has a 100% of market share of its individual mobile call termination market. There is a high entry barrier existing in this market. If the mobile terminating service provider raises the MTR, the originating provider still has to purchase the MTR service from the mobile network

operator which controls the mobile number. Thus, the countervailing buyer power is very low.

Since the authority in Taiwan has regulated the MTR in 2013, it has successfully resulted in a reduction in the off-net rate in the retail market. Therefore, considering each mobile network operator has a 100% of market share in the individual wholesale mobile call termination market, each mobile network operator is identified as the SMP. In order to promote effective competition in the retail market, it is recommended that the authority should continue to regulate the mobile call termination service market. That is, the charges of MTR are calculated based on the TELRIC method, and reviewed every four year.

(5) Fixed call orientation and termination market

The fixed call orientation and termination market includes orientation service and termination service provided by the fixed network operators. As for the fixed termination service, the fixed voice call service operator is the only provider which provides the termination service to the retail subscribers using the landline numbers controlled by the operator. The originating operator must

purchase the fixed termination service to fulfill the needs of end customer who want to call to the other party's landline number. There are four landline service operators in Taiwan currently, and the individual operator is the only provider of fixed call termination service in its fixed line network (i.e. 100% of market share in the individual fixed voice termination service market). However, Chunghwa Telecom owns 93% of the retail market share, so most of the fixed termination charges are received by Chunghwa Telecom.

As for the fixed origination service, according to the "Regulations Governing the Equal Access Service" in Taiwan, the landline service providers have to provide a pre-selection service. This allows the subscribers to choose to call through a different telephone company's network, although the subscribers' telephone lines are maintained by one company (normally the incumbent, i.e. Chunghwa Telecom), which charges the fixed orientation rate when providing the pre-selection service. The provision of fixed voice origination service can only be provided by the operator controlling the fixed line network. Among the four operators which provide landline service in retail market, Chunghwa Telecom has the highest market share of 93%,

being the biggest fixed voice orientation service provider. The countervailing buyer power of other fixed voice service operators is low, because if Chunghwa Telecom raises the fixed voice orientation rate, the other fixed voice service providers still have to purchase the fixed voice orientation service from Chunghwa Telecom to fulfill the calling service requirement of users.

In summary, due to the dominant position of the downstream fixed voice retail market, Chunghwa Telecom has a high market share in both of the fixed call orientation and fixed call termination services. Based on the SMP Guidelines, Chunghwa Telecom is identified as the SMP due to a high market share exceeding 50% in the fixed call orientation and fixed call termination market.

In order to promote effective competition in the retail market, it is recommended that the authority should continue to regulate the fixed call orientation and termination service market, with the related charges to be calculated based on the TELRIC method, and reviewed every four year.

(6) Internet interconnection bandwidth market

The exchanging traffic of internet has increasing dramatically due

to the development of digital economy. The exchange of internet traffic can be made either through peering or transit. Internet is formed by a structure of hierarchy, where one ISP can purchase the “transit” service from the upstream ISP to interconnect the whole internet, or one ISP can have peering with another ISP to mutually exchange internet traffic with similar data amount, normally by a settlement-free way. If the exchange data amount is not equal, however, the larger ISP may ask the smaller ISP to pay for the peering arrangement to share the cost of internet network (i.e. paid peering). Peering can also be classified according to whether the ISPs are directly interconnected or by IX interconnection. The direct interconnection between ISPs is called private peering; the IX interconnection is called public peering.

Although peering and transit is normally regarded as a substitute of internet traffic exchange, ISPs in Taiwan use peering as a main internet traffic exchange way, mainly concerning the quality of internet traffic exchange. Being the incumbent, Chunghwa Telecom is the tier 1 ISP in Taiwan, and other ISPs in Taiwan need to interconnect with Chunghwa’s internet network through a paid private peering.

The peering charges is currently regulated by the “Administrative Regulation Governing Tariffs of Type I Telecommunications Enterprises”. Before the peering charges was regulated by the authority, the charges of private peering by Chunghwa was very high. It has been improved since the authority regulated the private peering charge of Chunghwa Telecom.

Considering that the internet interconnection bandwidth costs account for a considerable proportion of the operating costs of ISPs and ICPs (internet content providers), and Chunghwa Telecom has the ability to raise the market price of private peering in Taiwan, Chunghwa Telecom is identified as the SMP in the internet interconnection bandwidth service market. It is suggested that the authority to regulate this market. Based on the SMP guidelines, it is suggested that Chunghwa Telecom make a voluntary commitment and adopt the Benchmark method (such as referring to the average prices of major countries / cities in the Asia-Pacific region) to reduce the private peering rate. It then will benefit the development of ISPs and ICPs in Taiwan.

(7) Wholesale fixed broadband and voice circuit market

The rental of fixed broadband and voice circuit is a wholesale service. Its products can be used by ISPs, mobile network operators, and enterprises with needs of business connectivity. The products include: (1) interface circuits between ISPs and their users (including local and long-distance leased circuits); (2) interface circuits between ISPs and ISPs; (3) interconnection circuits between type I telecommunications enterprises and type I telecommunications enterprises, between type I telecommunications enterprises and type II telecommunications enterprises which engage in a pure voice resale business, and between the E.164 internet telephone service providers (including local and long-distance leased circuits). The wholesale prices of these products are currently regulated by X value based on the “Administrative Regulation Governing Tariffs of Type I Telecommunications Enterprises”.

According to the statistics of NCC, as of June 2019, Chunghwa Telecom is the biggest service provider in the wholesale fixed broadband and voice circuit market. Chunghwa’s market share calculated in terms of number of circuit and bandwidth was 52% and

63%, respectively, both exceeding 50%. In addition, Chunghwa Telecom enjoys a competitive advantage of vertical integration, and has the ability to raise the market prices of above products because of its well-established infrastructure. As the above wholesale circuit rental products are key intermediate input elements required by communications service providers to provide their retail services to the end-users, the countervailing buyer power is limited.

Based on the above analysis and in line with the SMP Guidelines, Chunghwa Telecom is identified as the SMP in this market. In order to maintain a level playing field in the downstream retail market, it is suggested the authority maintain to regulates the wholesale fixed broadband and voice circus market by the means of price control by X value and related interconnection regulations.

(8) Fixed voice and broadband local access market

The products in the fixed voice and broadband local access market include local loop and xDSL circuits, which are currently regulated by the wholesale price control by X value based on the “Administrative Regulation Governing Tariffs of Type I Telecommunications Enterprises”. However, among the above products, copper twisted

local loop has been announced as the essential facility by the authority in Taiwan since 2006, and Chunghwa Telecom must calculate the charge of copper twisted local loop by a historical cost method.

According to the statistics of NCC, Chunghwa Telecom is the biggest service provider in the fixed voice and broadband local access market. As of June 2019, Chunghwa's market share calculated in terms of number and bandwidth was 89% and 63%, respectively, both exceeding 50%. In addition, the entry barrier is high as it is difficult for other operators to build the "last mile" of the communication network to reach the end-users. As local loop and xDSL circuits are key intermediate input elements required by communications service providers to provide their retail services to the end-users, the countervailing buyer power is limited.

Based on the above analysis and in line with the SMP Guidelines, Chunghwa Telecom is identified as the SMP in this market. It is suggested the authority should maintain to conduct the current wholesale price control measures and related interconnection regulations in the fixed voice and broadband local access market.