An Overview of the Broadband Market in Thailand

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Abstract—Thailand’s telecommunications sector is not fully transformed from monopolistic telecommunications markets into competitive one. The establishment of National Telecommunications Commission (“NTC”), an independent telecommunications regulatory agency, in 2004 has brought about the goal of creating a level-playing competition among incumbents: state enterprises, concessionaires, and new entrants. However, it becomes more challenging for NTC to achieve that goal when the concession agreement still exists. This fundamental problem has a direct impact on residential broadband Internet access as its system architecture relies heavily on fixed-line telecommunications network. The lack of enforcement by regulator and uncompromising attitudes between state enterprises and concessionaires are major impediments to the development of Thailand broadband market.

I. INTRODUCTION
Most governments have recognized the importance of broadband deployment for their country’s economic and social development. As a result, many governments have instituted policies to stimulate broadband growth, which include efforts aimed at leveling the playing field for competition, lowering the price of broadband service, and setting industry targets for national broadband connections. In Thailand, the Information and Communication Technology (“ICT”) Ministry oversees telecommunication policy. The NTC, an independent telecommunications regulatory agency, works closely with the ICT and to regulate and enforce telecommunication policy.

Due to the fast-changing nature of telecommunications, it results in convergence phenomenon that merges old telecommunication technology – that is, telephone lines and television cable - with new technology like Internet protocol. Broadband Internet service provided over existing telephone networks is commonly known as Digital Subscriber Line (DSL).

The convergence not only increases complexity in telecommunications competition, it also challenges regulators’ ability to maintain a level-playing field between incumbents and new entrants through new regulatory frameworks. As a result, the critical challenge to telecommunications regulators around the world is how to effectively regulate broadband Internet service so as to make sure that it is not in hands of monopolists, and instead serves public interest.

This paper will first give an overview of Thailand’s telecommunications problems. Second, I will examine broadband Internet technologies in Thailand and provide some empirical data on broadband development and growth in Thailand. Third, I will identify the key problems in Thailand’s broadband Internet diffusion and analyze Thai regulatory agency’s role in regulating broadband market.

II. AN OVERVIEW OF THAILAND’S TELECOMMUNICATIONS PROBLEMS

A. Regulator
The recent establishment of NTC in 2004 has kindled hopes for a level telecommunications playing field for competition, and lower barriers of entry for new market entrants. NTC has been active in trying to address the industry’s current monopoly problems. Since their inception, they have passed more than 60 new rules. However, NTC faces significant challenges as they try to reconcile conflict between state-owned enterprises and their concessionaires. One particularly problematic area is the broadband Internet market.

Most common type of broadband Internet services is Digital Subscriber Line (DSL) that requires a telephone network and Internet Protocol technology. As a result, it creates a disparity between incumbents and new entrants as incumbents can utilize their existing networks whereas new entrants must either build their own networks or use incumbents’ networks. However, without effective regulation, incumbents can easily
use their leverage in forms of pricing strategy and refusal to
deal strategy to drive their competitors or new entrants out of
the market.

NTC has been active in rule-making - announcing at least
60 telecommunications rules since it inception, including
Rules on Types of Telecommunications Business that Require
a Telecommunications License, Rules on Telecommunications
License Fees, Rules on Internet Service License, and Rules on
Internet Service Licensing Fees. However, NTC’s
interpretation of concessionaires’ rights as a
telecommunications operator, and its reluctance to enforce the
rules, have spurred public debate on its commitment to its core
principles of free and fair competition.

B. Concessionaires

Before the establishment of NTC in 2004, two state-owned
enterprises: Telephone Organization of Thailand (“TOT”) and
Communication Authority of Thailand (“CAT”), acted as
telecommunications licensing agencies. However, both TOT
and CAT also provide telecommunication services. They
directly and indirectly control fixed-line telephone, Internet
service, and mobile service.

TOT, which owns fixed-line networks, granted two
concession contracts to two private companies: True
Corporation and Thai Telephone & Telecommunications
(“TT&T”) to build more fixed-line network in separate
geographic area. True Corporation is responsible for Bangkok
and its vicinity area, while TT&T is responsible for the rest of
provincial area. Under the Build-Transfer-Operate term, both
concessionaires agreed to build the networks, and then transfer
ownership of the networks to the state enterprises after
completion. In return, True Corporation and TT&T were given
rights as concessionaires to operate and manage these fixed-
line networks for a certain period of time. During this
concession period, they agree to share part of their revenues to
the state enterprises. The government hoped this Build-
Transfer-Operate scheme would lead to faster and more
efficient diffusion of telecommunications infrastructures. In
reality, the arrangement has created impediments.

The competition among concessionaires in fixed-line does
not level playing field as it depends on terms each
concessionaire agree with state enterprises. TT&T pays 43
percent of their total revenues whereas True Corporation pays
16 percent of their total revenues. Although it is arguable that
each concessionaire does not directly compete against each
other in the same market, this still can potentially hinder the
deployment of fixed-line infrastructure especially in provincial
areas. Thus, it results in asymmetric market development.

C. State Enterprises

State enterprises received favorable terms in the concession
agreement, for example, concessionaires agree to transfer the
ownership in all network equipments, spare parts of these
equipments, billing system they procured and installed before
the beginning of their operation and during the concession
period to state enterprises provided that all these equipments
must be brand new and never been used and free from any
leasing term or obligation. In addition, concessionaire are
obliged to upgrade these equipments in accordance with any
technological change and during the concession period,
concessionaires agree to allow state enterprise’s technicians to
monitor or examine or gain access to concessionaire’s network
building.

However, although these terms are clearly stated in the
concession agreement, state enterprises have never strictly
enforce these terms when concessionaire violates the terms
such as concessionaire rent network equipments instead of
buying them or concessionaires deny state-enterprise’s
technician to enter into their network building for a security
reason. As a result, concessionaires can fully manage and
control the network and at the same time, be able to block
state enterprises from closely monitoring or using the network.
This leads to broadband problem since TOT is not able to
offer ADSL service using the network that concessionaires are
operating if TOT’s customers do not have concessionaires’
fixed-line number.
III THAILAND’S BROADBAND TECHNOLOGY AND ITS MARKET DATA

Broadband technologies are a term describing high-speed, always-on connection to the Internet. While there is no standard definition of the speed necessary for a connection to be considered “broadband”, it is widely agreed that it should be faster than basic rate Integrated Service Digital Network (“ISDN”) which operates at 128 Kilobits per second [1].

There are several key technologies for residential broadband Internet access; however, I will focus on Digital Subscriber Line (“DSL”)’s family technologies. DSL technologies refer to technology and equipment deployed on a telephone system to provide multi-channel high-speed network access, over a copper telephone line [2]. The telephone-based broadband technology, DSL, make possible for the transmission of data rates as high as 50 Mbps over copper access pairs that had primarily been designed for analogue voice transmission at up to 3.4 kHz [3]. In term of DSL data capabilities, it depends on the loop length that means the closer local loops are to a local exchange, the more data rate they can provide to customers.

One of DSL technologies is Asymmetric Digital Subscriber Line (“ADSL”) technology. ADSL technology is the transmission of data in each direction which consists of upstream and downstream data rate over one copper pair. The difference in data-carrying capacity between upstream and downstream gives rise to the term “asymmetric” because the signal going upstream is at a lower frequency; as a result, it has less data capacity than the high-frequency signal coming downstream to end-users. The basic architecture of a DSL exchange connection requires DSL Access Multiplexer (DSLAM) equipment that modulates data signal coming from a broadband network and voice signal coming from public switched telephone network (“PSTN”) onto DSL signal traveling on fiber optic and the copper line to customer premises. In other words, the DSLAM equipment is installed and used as a splitter or combiner where a PSTN, broadband network, and the copper loop are connected. At the customer premises, the line terminates at the Network Termination Equipment (NTE) and serves sockets giving connection to broadband and telephony customer premises equipment [3].

The empirical evidence shows that ADSL providers have been investing heavily in their networks to meet an increasing demand, and this trend will continue to be seen over the next five years. In terms of broadband access type, in 2004, 98 per cent of broadband subscribers mainly used a DSL connection. Other type of broadband access, such as cable modem and satellite broadband accesses are less promising and are expected to gain slow traction than ADSL due to high cost for customer premise equipment and high initial investment cost for a service provider. See TABLE I.

<table>
<thead>
<tr>
<th>TABLE I</th>
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<tr>
<td>THAILAND BROADBAND ACCESS SERVICES SUBSCRIBER SHARE BY TECHNOLOGY, 2004-2009 (PERCENTAGE)</td>
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<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tbody>
<tr>
<td>DSL</td>
<td>97.6</td>
<td>99.0</td>
<td>99.1</td>
<td>99.0</td>
<td>98.9</td>
<td>98.8</td>
</tr>
<tr>
<td>Cable Modem</td>
<td>0.4</td>
<td>0.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Metro Ethernet</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>FWA</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>0.4</td>
<td>0.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Other</td>
<td>1.9</td>
<td>0.8</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Source: International Data Corporation (“IDC”), 2005

In summary, it clearly shows that DSL technology will continue to play a key role in broadband access services regarding considering the subscriber penetration growth.

The total number of ADSL residential users is about 932,000 in 2006 accounting for 1.3 percent of Thai population with an increase of 40 per cent from 564,000 users in 2004. International Data Corporation (“IDC”) predicts that broadband penetration rate will rise to 3.8 percent by 2009, for a Compound Annual Growth Rate (CAGR) of 64 percent, see TABLE II.

<table>
<thead>
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<th>TABLE II</th>
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<tr>
<td>THAILAND BROADBAND ACCESS SERVICES SUBSCRIBER PENETRATION, 2004-2009 (IN THOUSANDS)</td>
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<tr>
<th></th>
<th>2004</th>
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<th>2006</th>
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<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>62,552</td>
<td>62,917</td>
<td>63,255</td>
<td>63,565</td>
<td>63,848</td>
<td>64,103</td>
</tr>
<tr>
<td>Total Broadband Subscribers</td>
<td>214</td>
<td>617</td>
<td>1,002</td>
<td>1,455</td>
<td>1,936</td>
<td>2,416</td>
</tr>
<tr>
<td>Share of Population (Percentage)</td>
<td>0.3</td>
<td>1.0</td>
<td>1.6</td>
<td>2.3</td>
<td>3.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Households</td>
<td>17,855</td>
<td>18,125</td>
<td>18,651</td>
<td>18,651</td>
<td>18,908</td>
<td>19,161</td>
</tr>
<tr>
<td>Residential Broadband Subscribers</td>
<td>182</td>
<td>564</td>
<td>932</td>
<td>1,359</td>
<td>1,804</td>
<td>2,231</td>
</tr>
<tr>
<td>Share of Households (Percentage)</td>
<td>1.0</td>
<td>3.1</td>
<td>5.1</td>
<td>7.3</td>
<td>9.5</td>
<td>11.6</td>
</tr>
</tbody>
</table>
According to Table II, Thailand broadband market is still in its first stage as a developing market. Although there are a growing number of broadband subscribers, the penetration rate is still very low comparing with other developed broadband market like the United States, Singapore, or Taiwan. The reasons behind this low penetration rate attribute to low level of infrastructure, low personal computer penetration, limited content developers, and high costs of broadband service. Mobile penetration has surpassed fixed-line penetration or even halted growth in fixed lines. This subsequently limits potential DSL broadband take-up especially outside cities.

The top five players in residential broadband market are also narrowband providers. As of October 2006, True Internet has 350,000 subscribers, TOT has 220,000 subscribers, and TT&T (under T-Speed and Max Net brand) has 126,917 subscribers, AIS (under ADC brand) has 20,000 subscribers, CS Loxinfo has 16,420 subscribers.

III BROADBAND PROBLEM IN THAILAND

The core problems of Thailand’s residential broadband service stem from the lack of competing broadband access technology that results in monopoly by Telco and the regulatory oversight of enforcing the rules.

The broadband adoption rate especially for high-speed residential service in Thailand is still low accounting for only 1 percent of the whole population. Although the market looks competitive as there are more than three broadband service providers in the market, the price per speed is still high. Since almost all residential broadband access service is ADSL technology using telephone line that accounts for 97 percent of all residential users, all top three broadband providers are True Internet, a subsidiary of True Corporation, TOT and TT&T, collectively called “Telco” that are either own or have the rights to operate the telephone networks. This means that it might be tough for new entrants who do not own local loop networks to compete since they need to buy the wholesale package from Telco in order to provide high-speed service to their customers.

Telco can stifle the would-be broadband providers by means of setting the wholesales price close to their retail price charging their end-users. For example, Pacific Internet, one of dial-up Internet Service Providers (“ISPs”), decided not to compete in ADSL broadband residential market, since they feel that the residential broadband market is controlled by Telco operators that own or have rights to operate a local loop. Some Telco use price subsidie strategy by setting wholesale price for using last-mile copper loop almost the same as a retail price they charge their own customers. The wholesale package covers only last-mile copper loop and DSLAM equipment but do not include the cost of international bandwidth, and billing cost that ISPs have to pay for which accounts for more than 50 per cent of the total costs of providing the service to end users. Therefore, after combining all costs, most ISPs without owning or having the rights to operate a local loop can not offer broadband service to their customers at the same retail price as Telco offer to their residential broadband customers. However, it is still arguable that the price that Telco charge their customers might still be above the competitive price or high, thus, might allow these would-be broadband providers to be able to earn some profit and stay in the broadband market.

The slow rate and high price has resulted in low rates of broadband usage. The average speed of residential broadband currently delivers only about 512 Kbps on upstream and 1 Mbps on downstream. As a result, users do not see a significant difference between using narrowband and broadband considering the fact that most Thai users typically access to Internet to search for information, check an email, and read news online; all of which is low-bandwidth contents that narrowband can provide acceptable speeds according to a survey conducted by National Electronics and Computer Technology Center (NECTEC). Another survey conducted by IDC on why narrowband users did not switch to broadband Internet access service. The results showed that the majority of respondents think that the current narrowband access service

1Personal interview with Khun Buncha Srisamanuwat, INET Executive Vice President, Engineering Group.
provides enough speeds. Interestingly, almost one-third of responses indicated that the price for broadband usage is still high despite the constant reductions in broadband service pricing.

The failure of telecommunications industry to provide more affordable high-speed data communication services will have major implications for the country’s development for two main reasons. First, as more information is being stored in electronic form, the utility of all information systems becomes increasingly dependent upon Internet-based communications, while progress in Internet services, in turn, is becoming more dependent upon broadband telecommunications [4]. Second, local telecommunications, known as “last mile” to end users does not exhibit exponential improvement in performance delivered at a given cost comparing with other digital information technologies, such as personal computer, digital cameras, fiber optic communications equipment. In other words, the major residential broadband service, ADSL has not significantly improved their price-performance ratios or technical quality since their introduction in 1990s. This attributes to the fact that the broadband service is still in the hands of Teclo as ADSL is the most common residential broadband Internet access technology for residential users, the lack of competing residential broadband technology increases monopoly in residential broadband market.

The slow rate and high price at which faster services have been deployed has resulted in reduced technical progress and low rates of broadband usage. In 2006, 5 percent of Thai households had Internet access. Of these, about two thirds still depended on dial-up modems, while only one third or about one million households use high-speed Internet access, based primarily upon ADSL service provided over telephone lines. Even these services, while faster than modems, are quite slow considering the speeds that computers are already capable of, and that technology can now deliver since most laptops are equipped with wireless technology. Current residential broadband services typically deliver only about 1 megabit per second downstream to homes and 512 kilobits per second upstream to the Internet. This is far less than true broadband speeds, and the structure of these services further reduces their utility.

Another important factor that impedes the broadband adoption is regulatory oversight. The problem is not the lack of rulemaking. Rather, the problem arises from lack of enforcement. A good example is NTC’s Rules on Internet Service License that imposes all types of Internet service providers to receive an Internet Service License. Since the implementation of the Rules on Internet Service Licenses, none of broadband providers, such as fixed-line concessionaires and state enterprises have obtained proper Internet Service Licenses especially Type III Internet Service License. The reasons for these broadband providers not getting a proper Internet Service License are simple. First, they can avoid paying annual fee for Internet Service License that is a separate annual fee for Telecommunications Business Operation License. For example, a Type III telecommunications operator that owns a fixed-line network and provide a broadband service as Type III broadband network access provider will incur two types of annual fees; a 3 percent of total revenues from its telecommunications business operation2 and 5 percent of total revenues from its broadband network access service3, all of which accounts for 8 percent of its total revenues. It is important to not confuse the annual fees under Internet Service Licensing rule with the annual fees under Telecommunications Operation Licensing Rule. The latter is the basic requirement that all telecommunication operators must obtain before operating any types of telecommunications business, for example, TOT and CAT have obtained a Type III Telecommunications Operation license and are obliged to pay 3 percent annual fees of their revenues to NTC.

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Another factor that is related to broadband deployment is the number of fixed-lines per 100 inhabitants is still low at 13.5; there is a great disparity between urban and rural area in the number of fixed-lines. The main reasons for Thailand’s slow increase in the number of telephone lines attributes to the sharp increase in the number of cellular mobile subscribers with a CAGR of 73 percent (2000-2005) [5] and the ongoing disputes between fixed-line concessionaires and the state agency (TOT) on various issues, for example, the scope of concessionaire’ rights to use the fixed-line network to offer broadband ADSL service. TOT claims that True’s broadband ADSL service is offered as part of the fixed-line concession agreement between TOT and True because it requires the use of fixed-line network to offer the broadband service. Therefore, the broadband service offered by True to their fixed-line customers is considered as a value-added service and shall fall under the scope of the concession agreement.4 True, in turn, argues that the broadband service is not under the concession contract with TOT since it is operated by True Internet, one of True’s subsidiaries. As a result, True Internet is not obliged to share 18 percent of the broadband Internet service revenue with TOT.5 Both parties sought the Arbitration Court ruling on this issue. However, the recent Arbitration court’s ruling on similar dispute regarding the use of fixed-line network resulted in a big blow to TOT as the award says that True was entitled to benefits TOT derived from the provision of TOT’s value-added service and from TOT’s permission for others to provide value-added services on the fixed-line network that True Corporation has the rights to operate.6 The court’s ruling spurs lots of debates on the network ownership issue since under the concession agreement, TOT has ownership in the networks that True is operating, while True has the rights to operate and manage the network. However, TOT has threatened to terminate the concession contract and also appealed the court’s ruling to the Central Administrative Court to override the Arbitration Court ruling which could take years before the dispute is completely resolved.7

In summary, the disputes between concessionaires and state agencies coupled have slowed the development of fixed-line infrastructure, weakened Thai telecommunications operators, and lessened foreign telecommunications operators’ confidence in investing in Thailand telecommunications. These factors have a direct impact on the adoption of ADSL residential broadband service since its system architecture relies on a fixed-line network.

REFERENCE


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5 Id.
7 Id.