NET NEUTRALITY REGULATIONS IN THAILAND TOWARDS THE BASIS OF FREE AND FAIR COMPETITION: STICK OR CARROT?

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Received Date August 31, 2020
Revised Date August 24, 2021
Accepted Date October 5, 2021

Abstract

This paper intends to examine whether net neutrality (NN) is a legitimate concern in Thailand. The issue of NN currently plays a major role in debates in many countries, while simultaneously posing challenges for policymakers. It is expected to become part of the global mainstream discussion in the near future. Net neutrality has impacts on various aspects of economics, politics, and society. In addition, the role of NN in telecommunications is of the utmost concern, especially its role in regulatory frameworks for content providers as it pertains to Over-the-Top (OTT) services, which have been increasing rapidly in recent years. Thus, this topic needs to be discussed and explored to determine whether NN is appropriate for Thailand, especially in the field of telecommunications regulations by drawing upon the documentary research to address the competitive concerns motivating NN rules and the potential impact of the proposed rules on consumer welfare. Results show that there is significant and growing competition among Internet service providers (ISPs), and that few meaningful competitive problems have been observed to date. Moreover, the zero-rating practices in Thailand have been generally harmless to users up to this point. Therefore, it seems that Thailand is better suited to a non-net neutrality (NNN) scenario, with ex-post or light-touch regulations, until there is compelling rationale motivating a move to NN as is being recommended by policymakers in Thailand.

Keywords: Net neutrality, Regulations, Internet service providers, Thailand

บทคัดย่อ

บทความนี้มุ่งวิเคราะห์ว่าหลักความเป็นกลางทางเน็ตควรเป็นประเด็นพิจารณาในการกำกับดูแลในประเทศไทยหรือไม่ หลักการนี้เป็นประเด็นสำคัญที่มีการถกเถียงกัน และท้าทายผู้กำหนดนโยบายอย่างกว้างขวางทั่วโลก ทั้งในมิติด้านผลกระทบต่อเศรษฐกิจ การเมือง สังคม รวมทั้งในด้านโทรคมนาคมซึ่งเป็นประเด็นที่มีความสำคัญ โดยเฉพาะการกำกับดูแลผู้ให้บริการเนื้อหาและบริการโอทีที ซึ่งกำลังมีบทบาทอย่างยิ่ง ดังนั้น จึงต้องมีการวิเคราะห์เพื่อพิจารณาว่าแนวทางของหลักความเป็นกลางทางเน็ตนั้นเหมาะสมกับประเทศไทยหรือไม่ โดยเฉพาะอย่างยิ่งการกำกับดูแลด้านโทรคมนาคม โดยใช้วิธีวิจัยเชิงเอกสารเพื่อวิเคราะห์บนหลักการด้านการแข่งขันอย่างอิสระและเป็นธรรม รวมถึงโอกาสเกิดผลกระทบจากมาตรการดังกล่าวต่อสวัสดิการของผู้บริโภค ผลการศึกษาแสดงให้เห็นว่า การแข่งขันในกลุ่มผู้ให้บริการอินเทอร์เน็ตมีความสำคัญและเติบโตขึ้น แต่ไม่พบปัญหาสำคัญที่เกี่ยวข้องกับการแข่งขัน นอกจากนี้ บริการเข้าถึงเนื้อหาบนอินเทอร์เน็ตแบบไม่มีค่าใช้จ่ายในประเทศไทยนั้น ไม่ได้สร้างผลเสียต่อผู้ใช้บริการ ด้วยเหตุนี้ประเทศไทยอาจเหมาะสมกับการไม่รับมาตรการหลักความเป็นกลางทางเน็ต และควรใช้มาตรการรับมือหลังเกิดปัญหา หรือการกำหนดมาตรการอย่างอ่อนจนกว่าจะมีแรงจูงใจที่สมเหตุสมผลเพื่อบังคับใช้มาตรการหลักความเป็นกลางทางเน็ตโดยผู้กำหนดนโยบายในประเทศไทย

คำสำคัญ: หลักความเป็นกลางทางเน็ต การกำกับดูแล ผู้ให้บริการอินเทอร์เน็ต ประเทศไทย

1. Introduction

Net neutrality (NN) is regarded as a controversial issue in various debates, with discussions ranging on whether it is dead or alive, whether it should be adopted or not, and how to apply it in different contexts. Generally, net neutrality refers to the principle of non-discriminatory practices applying to internet traffic management. Under NN rules, Internet service providers (ISPs) must treat all data transmitted on their network equally. The concept of NN has gained attention over the years among both policymakers and the private sector, specifically in the telecommunications industry. Net neutrality became a “hot-button issue” after the Federal Communications Commission (FCC) repealed the NN rule in 2017. The repeal officially took effect in 2018. The abolishment of the NN rule was proposed by FCC Chairman Ajit Pai, who was appointed by President Donald Trump. This repeal ended the 2015 Open Internet Order (OIO), put in place by Barack Obama’s administration. After the cancellation, the FCC

imposed the "Restoring Internet Freedom Order," which claimed to ensure a free and open internet, both for consumers and for internet service providers. There were, however, protests both online and offline to draw attention to the rollback of net neutrality. Nevertheless, after the incident, controversial questions surrounding NN have arisen, such as its validity, its appropriateness on the grounds of competition, aspects of consumer welfare, innovation, incentive to investment for Internet service providers, and even freedom of speech in the country.

To date, Thailand has not applied NN principles in its telecommunications regulations. Moreover, to the best of the authors' knowledge, discussion and study regarding this issue are scarce. Additionally, the recommendation to employ NN principles proposed in the existing academic studies is in contrast to the intention of the private telecommunications operators. Studies concerning NN in Thailand generally encourage the adoption of NN rules for a variety of reasons, including competition, transparency, and consumer protection (Jarintippitak, 2017; Sirilim, 2014; Wongprasit, 2017) However, the ISPs seem to disagree with the enactment of NN regulations due to an inefficient traffic management system. However, NN and its ramifications continue to be a pressing topic that is discussed globally. Moreover, NN is expected to be a challenge for policymakers, including within Thailand, particularly with regards to its relevance to the regulatory framework for over-the-top (OTT) services. The first contribution of this paper intends to ultimately provide a recommendation concerning the appropriateness and embrace of NN in the Thai context. Additionally, this paper intends to elucidate the general concept of NN and its relevant legislation. Afterwards, the advantages of NN are discussed in the context of Thailand, and finally, the action of the Thai government and its policymakers is considered.

The remainder of this article is organized as follows: Section 2 posits the objectives of the study, Section 3 declares the data and methodology used in the paper, Section 4 explains the general concept of NN, Section 5 summarizes the prior studies, Section 6 presents the results, including experiences in other countries, and examines the appropriateness of NN adoption in Thailand, Section 7 proposes guidelines for policymakers, Section 8 provides recommendations for future study, and Section 9 presents the paper's conclusion.

2. Objectives

2.1 To delineate the existing regulatory framework of NN in Thailand.

2.2 To elucidate the worldwide experiences of government intervention in NN.

2.3 To examine the rationale supporting NN in Thailand.

2.4 To provide guidelines regarding NN for policymakers in Thailand.

3. Data and Methodology

The aim is to achieve the research objectives by examining the current regulatory framework relating to NN from worldwide experiences, looking for an answer to the question of whether Thailand should adopt NN regulations. This paper employs a qualitative research approach, and data collection is based on the documentary method.

Data collection consists of documentary evidence from various sources, including public documents, newspapers, books, and academic papers attained through various publication databases (i.e. Emeralds, ResearchGate, Elsevier, ThaiLIS), as well as the mobile industry database known as GSMA. In addition to government papers (laws and regulations on NN and related issues), data collection comes from organizational documents (reports, strategic plans, minutes of meeting, charts), mainly from the NBTC and ISPs in Thailand. Data were collected between January and June 2020.

Data were analyzed through content analysis of the experiences of various countries globally that have accepted or considered adopting the principles of NN concepts. Data were collected and analyzed in order to frame the guidelines for Thailand's practice of the adoption of NN regulations in supporting a free and fair competition basis. The results are presented in a narrative style.

4. Net Neutrality: Definition and Stakeholders in the Ecosystem

The term net neutrality or network neutrality was coined by law professor Tim Wu in 2003. He proposed the framework of network neutrality on the grounds of the non-discrimination rule (Wu, 2003). Actually, the NN idea was developed with the concept of an "end-to-end" approach, encouraging open and free internet access (Audibert & Murray, 2016; Krämer et al., 2013; Reggiani & Valletti, 2016). With respect to the definition of this term, it is rather broad and not officially established. In general, the definition is that "Net neutrality prohibits internet service providers from speeding up, slowing down, or blocking Internet traffic based on its source, ownership, or destination" (Krämer et al., 2013, p. 796). This definition focuses on the action of internet service providers (ISPs) and their traffic management practices. Under a strict NN rule, ISPs cannot take any action on data traffic management. In other words, ISPs are obligated to bring data from Content Providers (CPs), transmit it on their system, and deliver the content to users without discrimination. As shown in Figure 1, the ISP acts as an intermediary bringing the content from CPs to users.

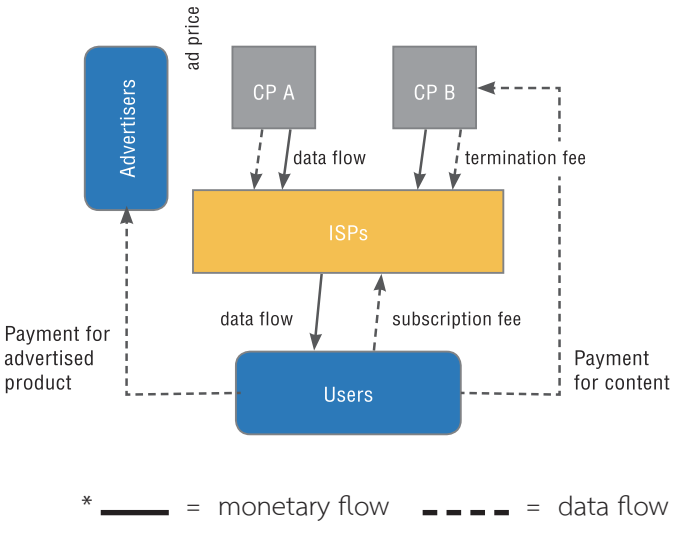

Figure 1 Internet Ecosystem

Source: Greenstein et al. (2016)

The other definition asserted by Hahn and Wallsten (2006, p.1) is that "Net neutrality usually means that broadband service providers charge consumers only once for Internet access, do not favor one content provider over another, and do not charge content providers for sending information over broadband lines to end users." This definition expands the first

by prohibiting charging for content providers. Figure 1 shows that users pay the ISPs for internet access via a subscription fee, while also paying a content access fee to CP B. This is common practice. On the other hand, users may not have to pay for internet connectivity to enjoy the content of CP A, because the internet subscription fee is covered by the advertisers. CP B adopts a one-sided business model, while CP A employs a two-sided pricing model. The business model of CP A is called zero-rating, which is regarded as a violation of the NN rule. There is a lot of concern and discussion regarding zero-rating activities. For instance, ISPs may favor one CP who is willing to pay over another CP that is not. A Paying CP might transmit data to users via a "fast lane" provided by the ISP, resulting in better service quality and enhanced user experiences. On the other hand, the unpaid CP has to deliver its content on a "dirt road," suffering unsatisfied users and resulting in a decline in customer usage. This situation can lead to several problems, such as unfair competition, consumer protectionism, and innovation hindrance.

To sum up, the meaning of NN, as asserted by the FCC, can be used to encapsulate the overall definition of NN. ISPs must be prohibited from: 1) Prioritizing traffic and charging differential prices based on priority status; 2) Imposing congestion-related charges; 3) Adopting business models that offer exclusive content or that establish exclusive relationships with particular content providers; and 4) Charging content providers to access the Internet based on factors other than the bandwidth supplied (Becker et al., 2010, p. 498). So far, the meaning of NN has been discussed with respect to how to precisely implement these rules within the regulations of each country, where the political, economic, and social contexts are diverse. Many regulators around the globe continue to debate how to implement these rules. However, many countries have announced and implemented these rules in their regulations. This information will be specified in the next section.

5. Literature Review

NN has been discussed in various ways. Several studies have investigated its effect primarily in order to discover that NN is an important principle for every stakeholder in the industry, including ISPs, content providers, and users. There is no one right answer. NN and non-net neutrality (NNN) regimes both have tradeoffs. However, by understanding the results, governments and policymakers can find compelling rationale for maintaining the status quo or switching to NN, and vice versa.

The studies regarding the ISPs under the NN policy are topics of popular debate about NN. The common assumption posited is that ISPs will lose their incentive to invest when the NN rule is applied (Hahn & Wallsten, 2016). The reason put forth for this is that they cannot control the traffic on the internet. As a result, they become a "dumping pipe" for content providers, meaning ISPs cannot manage the exaflood of data (the rapidly increasing stream of data transmitted over the internet). Moreover, an excess of data causes higher maintenance costs. On the other hand, without investing in maintenance, the quality of service drops, resulting in customers' switching to other providers, especially in such a highly competitive market. This claim was examined to be true in many cases (Bourreau et al., 2015). For example, a study found that ISPs' incentive to invest is relatively low under NN policies (Bourreau et al., 2015). Another study indicates that ISPs' incentive to invest depends on the tradeoff between the two sides of the market, those being the network access fee the users must pay, and the revenue gained on the content providers' side (Njoroge et al., 2014). One study found that such a claim is true, suggesting that the incentive to expand the infrastructure of ISPs is higher under NN regulation (Cheng et al., 2011). However, a counter study found that larger internet capacity leads to a decrease in sale price under a discriminatory regime (Choi & Kim, 2010). Thus, this common assumption does not hold true in all cases.

The relationship between NN and CPs is a recurring focal point among NN studies. As the upstream side of ISPs, CP investment incentive is worth considering. Usually, the studies focusing on the investment incentive of ISPs also weigh CP's incentive as tradeoffs within NN and NNN. One study found that the CPs' incentive to invest decreases under a discriminatory regime because they are concerned about ISPs' forfeiture of investment benefits, as well as higher prices (Choi & Kim, 2010; Njoroge et al., 2014).

Debates over content providers also focus on their innovation. Under a discriminatory regime, innovation is easily hindered. In that sense, NN is the principle protecting the innovation at the edge (Reggiani & Valletti, 2016), while at the same time advocating for the development of innovation (Singer & Litan, 2007). Moreover, abandoning NN might result in a reduction of startups' capability to compete in the marketplace, resulting in an overall decline in innovation (Giles, 2017; Guo et al., 2012). However, a study found that NN may delay the development of internet-based innovation due to insufficient quality of service arrangements (Bauer & Knieps, 2018). To prevent this outcome, a solution in which differentiation of network services is to be permitted has been proposed.

To ensure free and fair competition among operators of broadband service, the NN policy is considered to be a key measure in many countries. However, the effectiveness of adopting the NN policy is still in question. Anti-NN proponents suggest the answer as to how to maintain a free and open internet is to allow common benefits to operators and users with no-touch regulation (McGill, 2017). Similarly, Hahn and Wallsten (2006) disagreed with the NN policy, as well as with price regulation. Instead, they argued, the government should concentrate on creating competition in the broadband market by liberating additional bandwidth and reducing barriers to entry. Likewise, Kotrous (2016) argued that the key to improving consumer welfare is through deregulation, rather than increased regulation, of broadband providers.

Nowadays, NN topics continue to be the subjects of heated debates. There are no clear-cut results to say whether NN is a net positive or negative. There are certainly tradeoffs in imposing this regulation. Rebalancing stakeholders is the work of policymakers and regulators to complete, and it depends on multitudes of externalities, such as situation, context, competition, demand for internet, and content. Each case is individual. As for Thailand, there are many considerations to be made, which will be preliminarily discussed in this paper.

6. Result and Discussion

6.1 Experiences in the Adoption of Net Neutrality by Country

Countries adopted NN at different levels of intensity, and with different objectives. The reasons for adopting NN are mainly to protect users and the internet ecosystem, as stated in BEREC's Open Internet Regulation [Regulation (EU) 2015/2120]. However, not every country strictly implemented the rules or found them to be effective for their countries. Some countries adopted the rules but failed to enforce them, while others follow the rule more closely. A summary of the NN rules by country is exhibited in Table 1.

Table 1 Adoption of Net Neutrality by Country (as of August 2020)

	Country	Legislation/Guidelines	Zero-Rating Practice	Details & Current Status
Asia				
1	India	DoT Letter on Net Neutrality Regulatory Framework, dated 31-07-2018	Prohibited	- DoT (Department of Telecommunications) approved the recommendation of TRAI regarding NN, with amendments on licenses provided to ISPs. - The recommendation was effective from July 12, 2018.
2	Israel	Israel's Communications Law (amended)	Not specified	- Israel's parliament approved the NN law in 2011 for fixed-line services and in 2014 for mobile services. However, enforcement of zero-rating practices is vague.
3	Japan	MIC report 2007 Interim report and announcement, 2019	Not specified	- MIC (Ministry of Internal Affairs and Communications) Report 2007 recognized the NN principle but did not officially implement it due to competition concerns. - MIC is attempting to establish an NN framework.
4	Singapore	IDA's Decision and Explanatory Memorandum for the Public Consultation on Net Neutrality	Not specified	- Infocomm Media Development Authority (IMDA) released the decision letter in 2011, though niche or differentiated internet services are allowed.
5	South Korea	Telecommunication Business Act, Korea Communications Commission's Guidelines 2011, The Citizen's Coalition for Economic Justice and Open Web 2013, 2018	Not specified	- TBA defines some articles related to NN principles, but there is no enforcement implemented by KCC. - Currently, there are only guidelines regarding NN.
Africa				
6	South Africa	ICT White Paper 2016	Not specified	- The Department of Telecommunications and Postal Services (DTPS) published ICT White Paper recommending NN rules in 2016. There has been no further progress since.
North America				
7	Canada	Telecom Regulatory Policy CRTC 2017-104 (policy 2017-104)	Partially prohibited	- ISPs can offer differential pricing, though not for content.
8	Mexico	Federal Telecommunications and Broadcasting Law 2014 (updated in 2018) IFT (Federal Telecommunication Institute)'s draft for Traffic Management and Internet Administration	Prohibited	- There is a lack in binding the law from the IFT. - Currently, the new law is in progress.

	Country	Legislation/Guidelines	Zero-Rating Practice	Details & Current Status
9	USA	Restoring Internet freedom order (present) Open Internet Order 2015 (repealed)	Not specified	- Open Internet Order 2015 was repealed in 2017 and took effect in 2018. The new "Restoring Internet Freedom Order" was implemented in 2018. - The state government can establish its own rule regarding NN. - So far, there are four states that have enacted the NN rule; Washington, Oregon, Vermont, California. Six states have issued the executive orders; Hawaii, Montana, New Jersey, New York, Rhode Island, and Vermont.
South America				
10	Argentina	Argentine Digital Law	Not specified	- The law is not strictly implemented. - It was violated in 2017 by some mobile network operator (MNO)'s zero-rating practice.
11	Brazil	Marco Civil of Internet	Prohibited	- Implemented from 2014.
12	Chile	Law No. 20.453	Prohibited	- Implemented from 2010. The law was updated in 2018.
13	Colombia	The Act 1450	Not specified	- The law was implemented in 2011. - Violated by zero-rating practices.
Europe				
14	European Union (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden)	Regulation 2015/2120	Not specified	- The regulation was approved in 2015 and implemented in 2016. - Zero-rating practices are frequently exercised in the EU. There are only two countries that have not violated NN by zero-rating, Bulgaria and Finland. - Inconsistency between cross-border and internal legal enforcements.

	Country	Legislation/Guidelines	Zero-Rating Practice	Details & Current Status
15	United Kingdom	Regulation (EU) 2015/2120	Not specified	- Currently, the UK is obligated to submit reports to the Body of European Regulators for Electronic Communications (BEREC) under the law EU Regulation 2015/2120 until December 31, 2020, after which time, Ofcom, the UK telecom regulator, will be in charge under UK law.

Source: Jitsuzumi (2011); Kline (2019); Nguyen et al. (2020) (Adapted by authors)

6.2 NN in Thailand Context

Net neutrality in Thailand is not being practiced at present. The National Broadcasting and Telecommunications Commission (NBTC) – the Thai telecom regulator – does not currently employ this principle. While they do not have specific rules for traffic management, they do have standards for ISP quality of service (QoS) for licensees. According to the Notification of the National Broadcasting and Telecommunications Commission Re: Standard of Service Quality for Telecommunications Services B.E. 2562. (2019), the standard was adopted from the framework of the International Telecommunication Union (ITU), posited in ITU-T E.800 ("Quality of Service refers to the totality of characteristics of a telecommunications service that bear on its ability to satisfy stated and implied needs of the user of the service"). Regulations were established for ISPs to adhere to two main aspects: non-technical and technical parameters. Non-technical parameters refer to customer services, such as the percentage of service installation completed on or before the date confirmed, the number of fault reports per 100 subscribers, and billing accuracy complaints. Technical parameters require ISPs to conduct QoS measurements, such as network unavailability cumulative Last Mile Node outage time in a month ratio, Round Trip Time (RTT), FTP success ratio, and FTP ratio subject to specified data rate (e.g. in 75% of success before timeout, download speed for 4G must be at least 2.5 Mbps, and 500 kbps for uploading). The NBTC requires ISPs to measure and regularly submit reports to the NBTC. These regulations are implemented to assure the quality of services provided to users, as well as to regulate consumer protection.

Although the regulation adopting NN is absent in Thailand, there are some studies discussing the potential effects of NN on the country. Jarintippitak (2017) concluded that Thailand should carefully consider the NN policy and its effects in parallel with regulations aimed to motivate the production of local content in proper proportions. Another positive

opinion regarding the NN policy was proposed by Sirilim (2014), stating that the specific regulation on NN is required to balance freedom of use and traffic management control with the essential elements of competition and transparency. In addition, Wongprasit (2017) recommended that an NN measure should be enacted as a means to protect users of OTT services from the intervention of broadband operators. A further study conducted by Thailand Development Research Institute (TDRI, 2016) also proposed that NN should be implemented in order to protect freedom of speech and prevent unfair competition. However, ISPs and mobile network operators (MNOs) expressed opinions regarding NN in discussions arranged by the Internet Governance Forum (IGF) in 2015 and NBTC in 2017. Their opinions basically support NN only in terms of consumer protection, but not for traffic management. With so many suggestions and opinions from stakeholders, it will be the duty of the government to precisely consider the balance between internet freedom and traffic management control.

6.3 Decision on Adoption of NN in Thailand

Whether or not to adopt NN remains a challenge for regulators in Thailand. By adopting guidelines for policy decisions espoused in the literature (Bauer, 2007; Becker et al., 2010; Krämer et al., 2013), this section intends to examine the claims proposed by proponents of NN and whether they are appropriate for use in Thailand. Claims are justified on the grounds of fair competition resulting in consumer welfare. The competition between ISPs and zero-rating practices is discussed in this section.

6.3.1 Competition among ISPs

Proponents of NN basically worry about competition among ISPs; the ISPs can certainly exercise monopoly power or anticompetitive practices in the market under an inequitable regime. These actions can harm consumers (Hahn & Wallsten, 2006). However, this claim seems to deviate from the reality of the situation in Thailand. As shown in Table 2, indicators reflecting competition are presented. With respect to the fixed-line internet market, users increased to over 10 million subscribers in quarter 4 of 2019, with overall revenue reaching over 18 million baht in the same quarter. Competition indicators suggest that competition is acceptable. The market share of each provider does not exceed 40%, so none are considered to be a Significant Market Power (SMP), as defined by the Notification of the National Broadcasting and Telecommunications Commission Re: Identifying Operators with Significant Market Power in Telecommunications Market B.E. 2557. (2014). Moreover,

the Herfindahl-Hirschman Index (HHI) decreased during that time from 2,940 to 2,793, meaning that there was an increase in competition and balance of market share. Although the HHI number was over 1,800, which the NBTC defines as a highly concentrated market, this is quite common in the telecommunications market. In addition, the decreasing average price per month paid by users implies competition within that market. A totality of all the information illustrated indicates that the fixed-line internet market is fairly competitive.

Table 2 Fixed-line and Mobile Internet Market in Thailand 2017 - 2019

Fixed-line Internet													
Indicator	Operator	2017				2018				2019			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Market share	TICC (True)	38.1%	38.0%	37.9%	38.4%	37.4%	37.6%	37.8%	37.9%	37.8%	37.7%	37.5%	37.6%
	3BB	33.3%	33.5%	33.7%	33.2%	32.1%	32.2%	32.4%	32.0%	32.1%	32.4%	32.4%	31.4%
	TOT	17.9%	17.3%	17.0%	16.7%	18.9%	18.1%	17.5%	17.2%	16.7%	16.2%	16.1%	16.2%
	AWN (AIS)	4.9%	5.7%	6.0%	6.3%	6.5%	7.0%	7.4%	8.0%	8.5%	8.9%	9.5%	10.3%
	Others	5.7%	5.5%	5.4%	5.3%	5.1%	5.1%	5.0%	4.9%	4.9%	4.7%	4.6%	4.4%
HHI		2,940	2,930	2,929	2,927	2,855	2,854	2,858	2,847	2,838	2,837	2,824	2,793
Monthly average price per user (Baht)		617	631	642	641	617	619	615	609	596	582	586	588
Users		7.57	7.79	8.02	8.21	8.73	8.91	9.08	9.19	9.36	9.57	9.86	10.10
Revenue (Million Baht)		16,100	16,600	15,300	15,700	16,300	16,700	17,000	16,900	16,900	17,000	17,700	18,100

Mobile Internet													
Indicator	Operator	2017				2018				2019			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Market share	AIS	45.6%	44.6%	45.0%	46.0%	45.9%	45.8%	46.4%	46.9%	47.6%	47.9%	43.5%	44.9%
	dtac	28.5%	29.7%	29.8%	29.4%	29.8%	30.3%	30.2%	29.8%	29.3%	28.8%	21.7%	22.1%
	True	23.9%	23.6%	23.0%	22.4%	22.0%	21.6%	21.1%	21.1%	20.9%	21.1%	32.0%	30.2%
	CAT	1.0%	1.1%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.5%	1.5%
	TOT	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.3%	0.3%	0.3%	0.4%	0.4%
	Others	0.7%	0.7%	0.7%	0.7%	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%	0.9%	0.9%

Mobile Internet												
Indicator	Operator	2017				2018				2019			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
HHI		3,462	3,428	3,442	3,480	3,482	3,486	3,513	3,530	3,560	3,570	3,393	3,417
Average price Per user (Baht)		0.19	0.19	0.15	0.14	0.14	0.15	0.15	0.16	0.17	0.17	0.17	0.17
Users		38.5	39.4	40.2	41.0	42.0	42.6	43.3	43.8	44.4	45.1	45.7	46.3
Revenue (Million Baht)		27,529	29,494	30,232	31,593	32,646	34,188	34,511	34,823	35,051	35,332	44,131	46,698

Source: NBTC report in telecommunications market (2017 – 2019), GSMA (Compiled by authors)

The indicators in Table 2 show the mobile internet market to be less competitive than the fixed-line market (Note: the indicators are likely to decrease and fluctuate). Although the mobile internet market is growing steadily (Srinuan et al., 2012), the competitive level is still fairly limited. However, it is important to note that, compared to fixed-line internet, mobile internet usage is less mature, yet it is growing at a much faster rate. Mobile internet usage is seeing four times the growth rate of fixed-line usage, with revenue from mobile users double that from fixed-line subscribers.

The National Telecommunications Commission (NTC) (currently the NBTC) identified all the mobile network providers in Thailand (AIS, True, dtac, TOT, and CAT) as operators with Significant Market Power (SMP) in the Order of the National Telecommunications Commission No. 32/2553 Re: Identifying Operators with Significant Market Power in Each Relevant Market and the Operators with Significant Market Power to comply with Specific Measures B.E. 2553 (2010). With this notification, the actions of those operators are closely monitored by the NBTC in order to prevent anticompetitive practices. The operators must comply with specific procedures, such as separating accounts by type of service and submitting data and information about services charges and rates to the commission for supervision. Thus, concern about competition is not a solid assumption motivating the NN regime in Thailand.

6.3.2 Zero-rating Practices in Thailand

In Thailand, zero-rating practices are not prohibited. Santhi's study (2019) showed that all the mobile internet providers with their own networks - AIS, True, and dtac - offer this type of service to users. The characteristics of zero-rating can be summarized as follows: 1) Most of the zero-rating is compiled with popular mobile applications, such as YouTube, LINE, and Facebook. 2) Exclusive content provided by a particular provider is rarely found. Basically, the applications used by operators in zero-rating programs are also used by other operators. 3) Conditions of use are quite restrictive, such caps on as speed, data, and time. 4) ISPs frequently offer data exemptions on their own applications, such as TrueID by True and AIS Play by AIS, but they still have restricted usage. 5) Compared to fixed-line internet services, zero-rating is usually found in mobile services.

Overall, it can be said that zero-rating service in Thailand is not the main aim of content providers. Rather, it is considered as a strategy of operators to attract new users. Zero-rating is used as a "product differentiation" employed by operators to differentiate themselves from their rivals. It is a characteristic of competition (Eisenach, 2015; Krämer & Peitz, 2018). Allowing ISPs to offer different packages should positively result in consumer welfare. This ends up being a benefit for users, because they can choose the most efficient package, assign personal value to each attribute, and minimize the cost. In addition, these options allow ISPs to observe users' preferences in the market and modify their services to make the most of the data they collect, along with innovating new packages and products that better fit the users' lifestyles.

In summary, competition in the Internet market in Thailand is significantly increasing. The justification motivating an NN system is not sufficient at this point in time. The rationale for NN as a driver of competition and consumer welfare is not considered to be solid enough. Moreover, when weighing other risks, such as decreasing investment incentives, an overly regulated market negatively resulting in the free market, the status quo of the current system, NNN is more appropriate for the time being. For all of the reasons above, ex-post or light-touch regulations should remain in place until there is compelling evidence to suggest that NN would be better suited to the situation in Thailand.

7. Policy Implications and Recommendations

With the growth of broadband services, OTT issues became increasingly relevant. Time Consulting (2016) pointed out that the most important indicator to enact regulation on NN regards incidents of ISPs managing their own networks to alleviate congestion by blocking or distorting the quality of data transfer on OTT services. The NBTC should enact and enforce NN laws when the broadband internet network in Thailand is ready for overall accessibility, known as full competitive status. As concluded in the last section, ex-post regulation and case-by-case investigation after complaints are validated are more appropriate.

7.1 Recommendations to the NBTC as the regulatory agent

Before considering on adoption of the NN policy, apart from the competition issue discussed in the previous section, broadband penetration should be the first priority. The digital infrastructure in Thailand still faces disadvantages in the accessibility rate, with broadband penetration at 15.10% of the nationwide population and a per household accessibility rate of 47.59% (as of July 29, 2020) This paper agrees with the recommendations of Time Consulting (2016) that currently, a policy of NN is not yet necessary; the improvement of internet access is of greater importance.

Focusing on the Second Broadcasting Master Plan (2019 - 2023), strategies were formulated to promote free and fair competition among operators, prevent anti-competitiveness, and aim for public benefits with liberal access to information on an equal basis. Moreover, to promote competition in services, right-of-way is a measure to support new operators and startups, as well as the creation of standards in service quality by setting a mechanism to protect user's rights in terms of privacy, personal information protection, denial of service, complaints, and freedom of choice in services and operators. As pertains to all strategies formulated in the Second Broadcasting Master Plan, the NBTC plays an important role in regulation setting as the reconciliation unit between users and operators. Making a decision to regulate is a complex mission. Decisions should be based on the principles of transparency, objectivity, professionalism, efficiency, and independence. Moreover, in a fully competitive context, strict regulation seems unnecessary.

7.2 Recommendations to ensure consumer welfare

Discrimination regarding NN can occur with deregulation, which is why an antitrust enforcement mechanism provides a better framework for competition than the NN policy (Becker et al., 2010). Thailand has promulgated the Antitrust Law, known as the Trade Competitive Act B.E. 2560 (2017), which states that cartels, price fixing, output limitation, market sharing, and bid rigging are prohibited and subject to criminal prosecution (Article 54). Furthermore, activities related to cartels or that limit the competition in the broadband market are considered to be subject to administrative penalties (Article 50). Criminal punishment is proposed to support trade competition in an agile and fair environment. Moreover, anticompetitive practices are monitored by the NBTC under the notification regarding the Identifying Operators with Significant Market Power in Each Relevant Market and Measures for the Prevention of Monopoly or Unfair Competition in Telecommunications and Broadcasting Business Act B.E. 2557 (2014). Additionally, the Consumer Protection Act B.E. 2522 (1979) is one of the most effective legal mechanisms to protect consumer welfare.

8. Recommendations for Future Research

This paper focuses mainly on the roles and responsibilities of the NBTC. However, broadband sector management relies on the collaboration among stakeholders of various sectors. For further study about government issues, a collaborative model between the public and private sectors is needed. Also, a cross-sector agenda in administration, for example, with the Ministry of Digital Economy and Society or the Ministry of Education and the Ministry of Health should be emphasized, in order to drive the improvement of services for increased consumer satisfaction and to provide better quality of life outcomes.

9. Conclusion

After the repeal of the net neutrality rule in the U.S. in 2017 - 2018, NN became an even more controversial topic of debate, marking an increased challenge for governments and policymakers around the globe, Thailand included. This paper aims to tackle the issue and provide guidelines regarding the handling of NN for policymakers in Thailand, assessing the appropriateness of NN within the Thai context in terms of competition associated with

consumer welfare. The motivation to implement NN is posited for varied reasons, one of which is competition hindrance resulting in declined consumer welfare. Qualitative methodology was employed in content analysis across primary and secondary data sources. The results indicate that a hindrance in competition cannot be observed. Moreover, zero-rating practices, which are considered to be anti-NN, leading to consumer harm, are not as severe as expected by NN proponents, the reason being that zero-rating programs employed by ISPs and MNOs in Thailand are only used to attract new customers, not to hide or obscure cooperation between ISPs and CPs. In addition, the NBTC has established an anti-competition law limiting monopolistic tendencies of ISPs. The NBTC has also established consumer protection regulations requiring ISPs to safeguard user benefits. Through all of these considerations, the compelling rationale to switch to the NN policy is not appropriate for Thailand at the moment. As a recommendation to policymakers, ex-post or light-touch regulation is preferred. The government does not need to intervene in the market to over-regulate the current situation and worsen the terms of the free market. Additionally, antitrust laws are encouraged to be implemented rather than NN, until there is solid evidence indicating that NN is needed, at which time, if it comes, NN should be carefully implemented and regulated, with an eye on any changes to the telecommunications industry and their effect on the future.

10. Acknowledgements

The authors would like to express our gratitude to two reviewers of the NBTC journal for their constructive comments. Also, the authors are extremely grateful to Ajarn Victor Matthews for his contributions in revision and his kind support throughout the process of this paper. Last but not least, the authors would like to thank the NBTC staff for their helpful suggestions and guidelines, which are considerably complemented in the paper. This paper would not be complete without this generous support.

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