SECTOR OVERVIEW: INFORMATION AND COMMUNICATION TECHNOLOGY

A. Myanmar Background

1. Myanmar is the second-largest country in Southeast Asia with a land area of about 654,000 square kilometers and a population of about 52 million. About 29% of the population is under 15 years old, and about 55% is below 30.[1] At 90%, the adult literacy rate is high for countries with comparable income per capita. Myanmar's large and growing population, disproportionate percentage of youths, and high literacy rates are significant drivers of information and communications technology (ICT) adoption, especially mobile broadband and the resultant availability of music, video, software, and social media.

2. Annual gross domestic product growth was 7.0% in 2015.[2] The economy has been growing rapidly with annual gross domestic product growth rates exceeding 6% in recent years. High growth rates are attributed to the significant economic reforms, the substantial rise in foreign direct investment, and the increase in job creation and productivity. Myanmar is strategically located besides major economic markets that make up 40% of the world's population: Bangladesh, People's Republic of China, India, Thailand, and the Lao People's Democratic Republic. Many of Myanmar's neighbors are also growing rapidly. However, the poverty rate in Myanmar is still high at about 25%. The country's low income level limits the amount of money spent on basic and discretionary goods and services, including telecom usage.

B. Sector Framework

3. Over the past two decades, telecommunications—particularly mobile and internet—has become an essential element of a country's infrastructure. Among the key infrastructure elements, telecom can be rolled out the quickest and therefore takes the shortest time to produce a major positive impact. Telecommunications serves the economy in two ways. First, it facilitates economic activity, benefiting key sectors such as government, education, health, banking, and retail. Second, it is an economic activity in itself, creating jobs in construction, services, and retail. By facilitating or contributing to the performance of activities related to information and knowledge, telecommunications is at the heart of economic growth and development. In addition to the direct benefits, scaling up investments in telecom infrastructure would (i) improve access to domestic and regional markets, (ii) attract private investment, (iii) reduce urban–rural development gaps, and (iv) help countries reap the full potential gains from regional connectivity and integration. Moreover, the expansion of telecom coverage in remote villages will provide the rural poor with essential infrastructure for economic development, as well as enrich their lives through improved access to health and education services, better delivery of government services, improved security, improved job and small-to-medium business opportunities, and better communications with family and community. In Myanmar, inadequate telecommunications constrains economic activity in several sectors. At the same time, significant economic activity in the telecommunications industry is unrealized.

[1] The Republic of the Union of Myanmar. 2015. *The 2014 Myanmar Population and Housing Census: Highlights of the Main Results. Census Report Vol. 2-A.* Nay Pyi Taw

[2] The World Bank at data.worldbank.org/country/Myanmar (accessed 18 August 2016).

4. The Ministry of Transport and Communications (MOTC) oversees the telecommunications industry. In 2013, a new Telecommunications Law was approved that delineated MOTC's policy, regulatory, and operational functions. The new law fulfilled the basic elements of a liberalized telecoms regulatory framework set out by the World Trade Organization. Under the new law, MOTC's Post and Telecommunications Department (PTD) is responsible for regulatory functions. In 2013, after decades of underinvestment when communications networks were owned and tightly controlled by the state, the government announced an international bidding process for two international licenses. The two licenses were the subject of an international tender process, which was assisted by global strategy consulting firm Roland Berger, and was widely regarded as transparent and competitive. The government received 91 expressions of interest in February 2013 and 12 companies were shortlisted.[3] In June 2013, two bidders were competitively selected: Qatar's Ooredoo Group and Norway's Telenor Group.

5. The licenses were awarded based on several factors such as (i) the bidder's technical and financial capability to roll out a telecom network across the country under a tight time frame, (ii) its commitment to offer affordable prices to the population, and (iii) its proposed fee for the spectrum allocation. The ambitious targets under the licenses have been set to expand universal access to more than 90% of the population. The operating and associated spectrum license is structured on a build–own–operate basis that authorizes the operator to provide a full range of fixed and mobile telecommunications services on a nationwide basis for 15 years with an option to renew for an additional 15 years. The Myanmar Investment Commission has approved 100% foreign ownership for these two global operators.

6. The regulatory and competitive environment in Myanmar is evolving as the government continues to pursue significant reforms in the ICT and other sectors. The World Bank continues to play an important role in advising on the establishment of the telecoms laws and regulations. In July 2015, MOTC released a draft telecommunications master plan. The main objective of the plan is to establish Myanmar as a "mobile first, digitally connected nation" by (i) creating a Myanmar national broadband infrastructure asset, (ii) delivering communications content and services for the Myanmar people, and (iii) creating an enabling institutional framework.

7. The telecommunications market structure in Myanmar has been transformed from a monopoly into a liberalized environment with two international operators, the state-owned incumbent, and a newly approved fourth operator. The incumbent telecom operator, Myanma Posts and Telecommunications (MPT), has been corporatized and announced a memorandum of understanding with Japan's KDDI Corporation and Sumitomo Group in July 2014. The memorandum of understanding stipulates that KDDI Summit Global Myanmar will invest $2 billion over the next 10 years. MPT will share half of its earnings with its Japanese partners. In July 2015, KDDI and Sumitomo unveiled plans to overhaul MPT with a target to increase the state-backed firm's network footprint from 2,000 base transceiver stations (BTS) to 5,000 by 2016.[4]

8. In July 2015, MOTC invited applications from domestic public companies to participate in a special purpose vehicle (SPV) that would be formed in partnership with a foreign firm for the

[3] *International Business Times*. 2014. Telecom: Telenor And Ooredoo Will Need To Overcome Land Disputes, Electricity Shortage And Other Hurdles. http://www.ibtimes.com/myanmar-telecom-telenor-ooredoo-will-need-overcome-land-disputes-electricity-shortage-1568411 (accessed April 7, 2014).

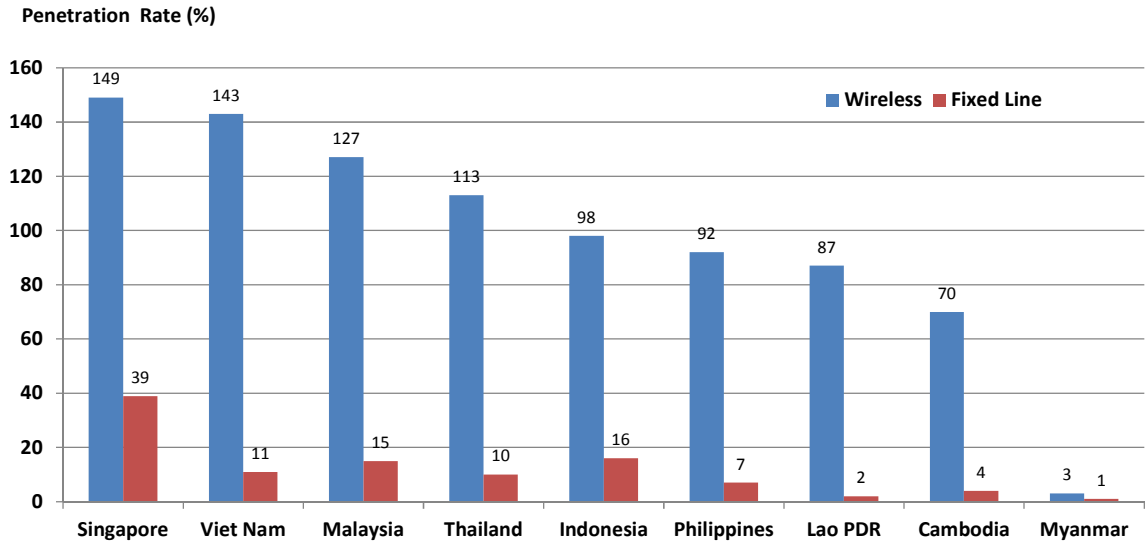
[4] *TeleGeography,* 2015. KDDI, Sumitomo to increase MPT's Myanmar footprint to 5,000 BTS. 8 July.

fourth telecom license. The Myanmar firms were selected first, followed by the foreign partner. MOTC announced in November 2015 that the SPV had been formed with 11 local companies. In March 2016, Viettel, a telecoms operator from Viet Nam, was chosen as the foreign partner that will own up to 49% of the partnership; the rest will be owned by the SPV and Star High Public Company, a subsidiary of military-run Myanmar Economic Corporation.

C. Sector Demand

9. In 2011, Myanmar had the lowest penetration of telecommunication infrastructure among countries in the Association of Southeast Asian Nations (Figure 1). Penetration levels were well below 10% for mobile, and even lower for fixed line and internet.

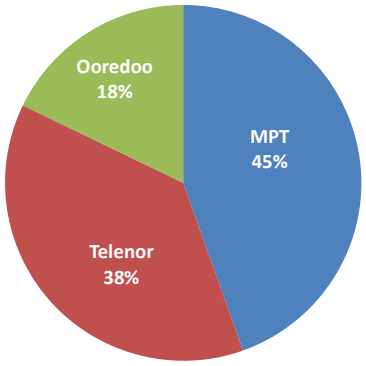
Figure 1: Telecommunication Penetration Rates Among Countries in Association of Southeast Asian Nations (2011)



Lao PDR = Lao People's Democratic Republic.
Source: Deloitte. 2013. *Myanmar: The Next Asian Telecommunications Greenfield?* Singapore.

10. As late as 2013, Myanmar had only about 4.4 million mobile subscribers served exclusively by the government-owned monopoly provider MPT. Subscriber numbers have exploded since then, reaching 44.9 million by the second quarter of 2016. This growth has been driven by the aggressive rollout of voice and data services by Ooredoo and Telenor since 2014. While MPT's market share has dropped to less than 50%, its subscriber base has more than quadrupled, boosted by the 2014 partnership with KDDI and Sumitomo.

Figure 2: Myanmar Mobile Operator Market Share and Number of Subscribers (Q2 2016)



Mobile Operator	2013	Q2 2016
MPT	4,400,000	20,000,000
Telenor	0	16,900,000
Ooredoo	0	8,000,000

MPT = Myanma Posts and Telecommunications, Q = quarter.
Source: Operator data.

11. While growth in the telecom sector is interdependent with the country's overall economic growth, Myanmar's ICT services growth potential is much greater than its neighboring countries. In 2015, Myanmar added more new mobile subscribers than any other country in the world except for People's Republic of China and India.

Table 1: Net Subscriber Additions, by Country

Rank	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016
1st	India, 26M	India, 12M	India, 13M	India, 21M	India, 21M
2nd	PRC, 8M	**Myanmar, 5M**	PRC, 7M	PRC, 6M	**Myanmar, 5M**
3rd	**Myanmar, 5M**	Nigeria, 4M	US, 6M	US, 5M	Indonesia, 5M
4th	Indonesia, 4M	US, 4M	**Myanmar, 5M**	**Myanmar, 5M**	US, 5M
5th	Japan, 4M	Bangladesh, 3M	Nigeria, 4M	Nigeria, 3M	Pakistan, 3M

PRC = People's Republic of China, M = million, Q = quarter, US = United States.
Source: Ericsson Mobility Report June, August, and November 2015; and February and June 2016.

12. Consequently, teledensity had risen from less than 10% to over 60%. Demand for digital and data services is also strong, driven by the high percentage of subscribers using smartphones.

D. Tower Market Overview

13. The core component of a mobile network is the base transceiver station (BTS), which is made up of a radio and associated equipment that is responsible for sending and receiving cellular signals. Each BTS is mounted on and around a tower. The tower provides the infrastructure to support the cellular antennas and associated equipment. Each tower can support about 3,000 subscribers.

14. Unlike in more developed markets, the new international telecom operators in Myanmar, Telenor and Ooredoo, chose the "tower company model" to deploy its telecom network from day 1. Under this model, the telecom operator outsources the construction, operation, and maintenance of its towers to a third-party tower company, and installs its equipment on towers owned and operated by the tower company. The tower company constructs and manages the

tower infrastructure, which it leases to the telecom operators under long-term contracts. This business model allows faster deployment cycles to meet the aggressive rollout targets and achieve cost efficiencies by sharing tower infrastructure with other telecom operators.

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