SCB Economic Intelligence Center

Note by EIC

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1800 and 900 MHz spectrum auctions … a key factor driving the telecom business and the Thai economy

Highlight

The 1800 and 900 MHz spectrum auctions during the latter half of 2014 will be an important driver for the telecom business and the Thai economy. Both bands can be used to serve rising 3G and 4G demand and allow the 3 mobile operators to make good use of both low-band and high-band spectrums. We expect the 1800 MHz auction to be more competitive than the 900 MHz auction to the extent that the 1800 MHz final bidding price could be significantly elevated, allowing the country to benefit from increased national revenue. While the technology transition after the bidding will directly benefit the telecom business, it will also provide further positive impact on the economy on top of the bidding revenue. For example, the required network investment and the anticipated growth of mobile application and content businesses will further ripen the telecom business, as well as create additional jobs and add value to the country.

Mobile operators need to own various frequency bands in order to keep up with constantly changing technology and variations in consumer demand. The characteristics of each frequency band differ. For instance, low frequency bands such as the 700, 850, and 900 MHz bands have larger coverage areas but are not suitable for high or dense data usage. On the other hand, high frequency bands such as the 1800, 2100 and 2600 MHz have lower coverage areas but can process larger quantities of data at higher speed. As such, operators should own at least 2 bands, namely, one low band for services in provincial areas that demand higher coverage with scattered data usage, and one high band to service areas with high and dense data demand such as in Bangkok. In reality, the use of both high and low bands in one area is also common because low frequency bands like 900 MHz can better increase service capability in tall buildings compared to high frequency bands like 1800 MHz.

For Thailand, 1800 MHz will facilitate 4G usage, while 900 MHz will support more far-reaching 3G coverage. These frequency bands can also be used to service 2G, which is likely to remain in demand at least in the next 5-7 years. Thailand's higher demand for 4G comes from a shift towards "on-the-go" and "always-on" lifestyles, which includes the viewing and sharing of online videos that requires larger and faster data processing than 3G. The 1800 MHz band will be most appropriate for 4G use because the number of existing smart device brands and models (including smart phones, tablets, and other smart devices) that support 1800 MHz use is highest worldwide. The situation was drastically different from the current one when looking back to the August 2013 period when DPC (AIS) and TRUE's 1800 MHz concession was about to expire. Back then the number of smart device brands and models that supported 1800 MHz was much smaller and the phones more expensive, and on top of that,

the demand for 4G was low. It was therefore the right call for NBTC to postpone the 1800 MHz auction to 2014 to allow the technology to be ready on all three fronts: devices, operators, and consumers. Meanwhile, the 900 MHz band is suitable for enhancing 3G potential, as data demand is increasing throughout the country. However, 2G services need to be maintained as there is still demand from financial institutions for ATM systems and from tourists for roaming services. ITU has forecast that 2G services will still be necessary worldwide for the next 5-7 years.

Judging from the current spectrum ownership among the 3 mobile operators and Thailand's 4G-technology readiness, the 1800 MHz auction should be more competitive than the 900 MHz auction, potentially lifting the 1800 MHz final bid substantially higher. Frequency bands lower than 1000 MHz are typically more valuable than those higher than 1000 MHz since they offer 2 times greater coverage area, which leads to a 10 times greater reduction in network investment costs. Consequently, various countries including Thailand have chosen to set a higher opening bid price for 800-900 MHz when compared to 1800-2100 MHz. However, for Thailand there is a high possibility that the final bid price for 1800 MHz will be higher than the 900 MHz final bid price due to higher competition. This is because the 1800 MHz auction during August 2014 will only feature two licenses, whereas there are at least 3 operators participating. Furthermore, there are clear signs of higher 4G readiness and demand for 4G-technology. The key determinant will be whether DTAC will compete as aggressively as the other two operators, since DTAC still owns a 1800 MHz spectrum under concession. However, the upside from regulatory cost savings should it win the auction and migrate customers to a new 1800 MHz spectrum under the license system is quite attractive to the operator.

As for the 900 MHz spectrum bidding to be held after the 1800 MHz auction, AIS appears to be the clear beneficiary as the spectrum currently belongs to them under concession, but they would have to forgo this in 2015 along with a large customer base should they not win back the license. Furthermore, in the short-term there are no other low frequency substitutes for 900 MHz for AIS. Meanwhile, DTAC and TRUE each already own a 850 MHz spectrum under concession which has similar qualities to 900 MHz and the concession will last until 2025. We therefore expect AIS to be the main operator interested in bidding for 900 MHz, causing the final bidding price to only increase slightly from the starting price.

Spectrum bidding and transitions to 4G will increase operator competitiveness and will directly and indirectly benefit Thailand's economy and the telecom business in the long term. The direct and tangible benefits for the Thai economy, and hence what the public focuses on, are the bidding fees paid by license winners. However, if the opening bid price is set at an excessively high level, such as was the case in India and Australia, spectrums may not be completely allocated in order to fully service the population. Or if the bidding is too aggressive, as was the case in the Czech Republic and Taiwan, though the government will receive high bidding revenue, operators could eventually pass on the high license costs to customers. Note that additional benefits for the economy and the telecom business will be more pronounced after the auction, as operators will have to invest in network infrastructure in order to commercially utilize the spectrums. The aforementioned investments will amount to more than 100 billion baht within 3-5 years after the auction and will create additional jobs in engineering and IT. In the long term, network investment will transform Thailand's telecom supply chain landscape. For instance, only two years after the 2100 MHz auction Thailand's smart phone penetration has surged to 40%, with a market size as high as 60 billion baht in 2014. Furthermore, the 2100 MHz auction has prompted application and content development for smart phones, helping modernize communications and advertising channels.

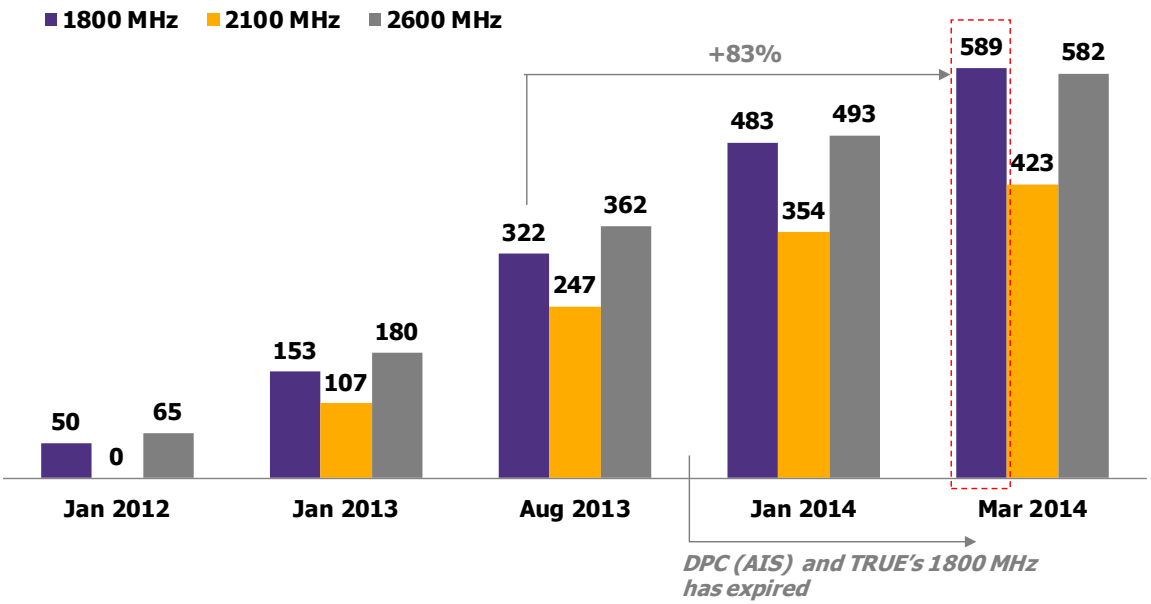
Implication

- **Technology transition will continue to provide a positive driver for infrastructure developers and other value-added markets, such as application and content developers.** The technology transition from 3G to 4G and subsequent intensified data use will require large scale network investment that will benefit installation service providers and suppliers. The growth of smart phone application and content developers will also follow as they will be attracted by billions of baht in mobile advertising money currently in circulation.

- **Mobile dealers could be negatively impacted by mobile operators' various handset promotions to entice customers to shift to the more profitable 3G/4G technology.** Servicing 2G will no longer be worthwhile for operators as the customer base continues to shrink against high concession and network maintenance costs. Meanwhile, 3G and 4G technologies will open up new revenue opportunities for operators on the back of reduced regulatory and operational costs. Operators could expedite the transition to 3G and 4G via establishing supply contracts with mobile manufacturers to churn out cheaper phone models compatible with the 900-1800-2100 MHz bands for 3G and 4G use. Operators could also directly award handset subsidies to help customers switch. Either strategy could impact the sales of mobile phones in typical mobile stores.

Figure 1: The number of smart device models (including smart phone, tablet, and other smart device models) that support 1800 MHz band for 4G/LTE use is the highest worldwide. The figure grew by more than 80% when compared to before DPC and TRUE's 1800 MHz spectrum concessions expired.

Unit: number of models



Source: EIC analysis based on data from GSACOM

Figure 2: Examples of direct and indirect benefits to the economy and the telecom business from the 2100 MHz auction

Direct benefits to the economy and the telecom business from the 2100 MHz auction

- **41 billion baht –** national revenue from spectrum license auction paid as public resource revenue to the Ministry of Finance
- **3 billion baht per year –** estimated minimum regulatory fees equivalent to 5.75% of operators' revenue on 2100 MHz spectrum to be used to develop rural telephones and the country's overall telecom networks

Indirect benefits to the economy and the telecom business from the 2100 MHz auction

- **60-70 billion baht per year –** total network infrastructure investment such as for core networks and fiber optics in each of the 3-5 years after the auction
- **60 billion baht –** market size of smart phones in 2014, having grown 30% per year since the 3G auction in 2012, leading to a 40% smart phone penetration rate currently
- **15 billion baht –** market size of mobile internet in 2014, a 26% jump from a year earlier, having benefitted from a growing smart phone market, social media usage, and mobile commerce
- **2 billion baht –** market size of internet data center in 2014, having grown 20% per year since 2012 from enterprise demand for faster data processing by 3G
- **1 billion baht –** estimated mobile advertising revenue in Thailand, which will attract new forms of mobile application and content development

Source: EIC analysis based on data from operators, NSTDA, NBTC, Telenor and Frost & Sullivan

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