Design analysis of consolidation of cellular operators in Indonesia

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Abstract. To increase the network capacity demands cellular operators have to add sites, use technology with a high efficiency spectrum, and increase spectrum allocation. The limited frequency spectrum becomes an obstacle for operators in increasing the availability of system capacity, which in turn can reduce the quality of mobile broadband services. Indonesian cellular operators are expected to have a spectrum deficit of around 400 - 450 MHz in 2020. One way to overcome spectrum deficits is consolidation between cellular operators. It is therefore very interesting to conduct a consolidation research of Indonesian operators and evaluate and analyze their impact on reducing spectrum deficits and competition. In this research the consolidation design was carried out with the following provisions: a maximum of two operators, migration of spectrum two of the consolidated operators that were not contiguous was carried out to a minimum, the consolidated spectrum of results is a contiguous frequency, and no spectrum divestment. The consolidation scenario of Indonesian cellular operators is simulated on operators namely Tsel, XL, Isat, and H3I operating at frequencies of 900, 1800 and 2100 MHz in six regional mobile broadband services namely Sumatra, Java, Bali Nusa Tenggara, Kalimantan, Sulawesi and Maluku Papua. There are three consolidation scenarios. Scenario I consolidation consisted of H3I+Isat consolidation, XL+Tsel, scenario II consolidation consisted of H3I+XL consolidation and Isat+Tsel consolidation, and scenario III consolidation consisted of H3I+Tsel and Isat+XL consolidation. First evaluated consolidation which gives the least spectrum deficit. Then the consolidation scenario is evaluated using company operational and financial data to decide which operator consolidation provides efficiency and fair competition. It can be shown from the results that the best technically consolidated operators may not necessarily provide good financial results.

1. Introduction

In Indonesia, the penetration of cellular phone usage in recent years has increased very rapidly. Based on the report on the implementation of cellular operators in 2011, the number of cellular subscribers in Indonesia was recorded at more than 250 million users, until the end of 2017 the number increased to 58.64%, which was recorded at more than 435 million subscribers. This number has exceeded the population in Indonesia, which is recorded at 265 million inhabitants. However, the growth in the number of subscribers does not guarantee that the cellular telecommunications industry will continue to experience increased revenues. According to data from the Indonesian Telecommunications Association (ATSI), in 2018 the cellular telecommunications industry in Indonesia recorded a decline of 6.4%, the worst, due to reduced use of voice and sms services, and increased data traffic. While
cellular operators in Indonesia are competing to reduce data prices, so the high costs incurred are not balanced with the income received. This certainly can affect the company's financial performance, where almost all cellular operators suffer losses. In addition, unfair competition occurs because of the imbalance in the number of users owned by cellular operators. There is big operator controls almost 50% of the cellular market share. Cellular operators in various ways are trying to get a high market share so that the price war is inevitable. The occurrence of the price war indicates that there is unfair business competition [2], [3].

With increasingly fierce competition among cellular operators to get users all strategies are also implemented. The price war is inevitable to attract users. In order to reduce costs, it is not uncommon to reduce the quality of service. Internet access is slow, the sound quality is also not clear and many other problems that become customer complaints. Besides that, the company's financial condition is also sacrificed.

In several countries in Europe such as Germany, Ireland and Austria, problems in the telecommunications industry are overcome by consolidating cellular operators [4]. Some cellular operators in Europe claim that their revenue has been reduced due to intense competition. Competition does not only occur between cellular operators, but also with global and over the top (OTT) internet players such as WhatsApp and Skype, which offer alternative services at lower prices. While cellular operators must also continue to invest a large amount for broadband networks in order to improve the quality of data services, so consolidation is seen as an effort to increase investment and profitability of the company [5]. The consolidation of cellular operators can increase investment in cellular telecommunications infrastructure and by combining frequencies and networks will improve service quality for users. In addition, by doing consolidation can improve cost efficiency so that prices can be lowered [4],[6]. This is not only beneficial for cellular operators but also for users. Some reasons for consolidating cellular operators are, among others: gaining new markets, strengthening business, reducing competition, increasing market share, increasing company finances, and acquiring new technology [7], [8].

Consolidation of four Indonesian cellular operators has been simulated and analyzed by Roland et al [9]. The strengths of this research are the service quality approach for service to users and also the efficiency in the use of radio frequency spectrum. However, this research has a drawback where it does not consider the elements of business feasibility and efforts to improve the financial condition of cellular operators to be consolidated.

The problem that will be discussed and analyzed in this research is how the consolidation scenario can improve the financial condition of cellular operators so that fair and balanced competition can be realized. Pursuant to Government Regulation Number 57 of 2010 concerning the Merger or Consolidation of Business Entities and the Acquisition of Company Shares that Can Result in the Occurrence of Monopolistic Practices and Unfair Competition in Article 2 Paragraph (1) states that, "Business actors are prohibited from conducting business combinations, merging business or takeover of shares of other companies that may result in monopolistic practices and / or unfair business competition [10]." Therefore, this research will be conducted by analyzing the consolidation scenario that has been designed by assessing the market balance and the balance of the financial capabilities of the consolidated cellular operators.

In contrast to that was done in research conducted by [9], this research was conducted using operational performance data and company financial data in 2013-2017. The analysis was carried out with several methods, namely calculating financial ratios to measure the feasibility of a consolidated scenario business, then a combination analysis between time series and cross sections to compare each consolidation with a span of 5 years from 2013 - 2017.

Financial ratios are one of the tools used to conduct business feasibility analysis [11]. There are four types of financial ratios that are commonly used to measure a company's financial capability including liquidity ratios, solvency, profitability and activity [11] - [13]. The four financial ratios can show the financial capability and business feasibility of mobile operator consolidation modeling. The results of the financial ratios will be combined analysis by combining time series analysis and
financial data cross section [14]. In addition, forecasting is also carried out to predict the likelihood that will occur until 2025. Analysis and selection of scenarios is based on the realization of market balance and the performance of each consolidated result.

2. Consolidation Scenario

In [9] it was simulated the consolidation of the merger of four mobile network operators in Indonesia, namely Tsel, ISAT, XL and H3I in six regional mobile broadband services namely Sumatra, Java, Bali Nusa Tenggara, Kalimantan, Sulawesi and Maluku Papua. This consolidation is done by modeling the merging of a maximum of two mobile network operators. The consolidation scenario aims to optimize the use of the radio frequency spectrum by prioritizing the feasibility of mobile broadband services for the benefit of users. The allocation of the 900 MHz, 1800 MHz and 2100 MHz frequency bands belonging to 4 cellular operators is shown in Figure 1.

The consolidation scenario that occurs from 4 cellular operators consisting of scenario I, is the consolidation of Tsel+XL and ISAT+H3I, scenario II is the consolidation of Tsel+ISAT and XL+H3I, and scenario III is the consolidation of Tsel+H3I and ISAT+XL.

Scenario I, which is a consolidation of Tsel+XL and Isat+H3I [9]. In the scenario I, Tsel and H3I will migrate on the 2100 MHz band in 2017, with details projected as many as 67,815 sites belonging to Tsel and 20,200 sites belonging to H3I for the entire region. Available capacities for H3I+Isat, XL and Tsel for the Java region have remained in deficit since 2011. The available capacity of H3I+Isat, XL and Tsel is projected to be sufficient for the Sulawesi, Bali Nusra and Kalimantan regions. The available capacity of H3I+Isat for the Sumatra region is projected to be only sufficient until 2021. In the consolidation of scenario I, only three cellular operators were obtained, namely: H3I+Isat, with occupied bandwidth of 46.2 MHz, XL and Tsel, with occupied bandwidth of 33.7 MHz. Comparison of the number of H3I+Isat users: XL: Tsel = 29.68%: 20.76%: 49.56%; and number of H3I+Isat sites : XL: Tsel = 39.82%: 19.94%: 40.24%. In the consolidation of scenario I there was no bandwidth consolidation in the 900 MHz frequency band.

Scenario II which is the consolidation of Tsel+Isat and H3I+XL got results migration of the 2100 Isat and H3I bands in 2017, with projected details of 20,200 H3I sites and 19,660 Isat sites for the entire region. Available capacity from both H3I+XL and Isat+Tsel for the Java region has remained a deficit since 2011, but is better than the consolidation of scenario I. The available capacity of both H3I+XL and Isat+Tsel is projected to be sufficient for the Sumatra, Bali Nusra, Kalimantan, Sulawesi and Malpua regions so that no additional sites are needed as in the consolidation of scenario I. There are only two cellular operators operating in the 1800 MHz and 2100 MHz frequency bands namely: H3I+XL, with occupied bandwidth of 53.7 MHz and Isat+Tsel, with occupied bandwidth of 63.7 MHz. Comparison number of H3I+XL subscribers: Isat+Tsel = 37%: 63% and number of H3I+XL sites: Isat+Tsel = 40%: 60%. In the consolidation of scenario II there is a consolidation of bandwidth Isat+Tsel in the 900 MHz frequency band.

Scenario III as a consolidation between Tsel+H3I and Isat+XL gives results as follow. Isat and H3I will migrate on the 1800 MHz band in 2017, with details projected as many as 20,200 sites belonging to H3I and 19,660 sites owned by Isat for the entire region. The available capacity of both Tsel+H3I and Isat+XL for the Java region has remained a deficit since 2011 on a scale of hundreds of MHz, but worse than the consolidation of scenario II. The available capacity of both Tsel+H3I and Isat+XL is projected to be sufficient for Sumatra, Bali Nusra, Kalimantan, Sulawesi and Malpua regions so that no additional sites are needed as in the consolidation of scenario I. There are only two cellular operators operating in the 1800 MHz and 2100 MHz frequency bands namely: H3I+Tsel, with occupied bandwidth of 53.7 MHz and Isat+XL, with occupied bandwidth of 63.7 MHz. Comparison of the number of users in 2017-2025 is number of H3I+Tsel subscribers: Isat+XL = 52.7%: 47.3% and number of sites H3I+Tsel: Isat+XL = 63%: 37%. In the consolidation of scenario III there is a consolidation of bandwidth Isat+XL on the 900 MHz frequency band. However, before consolidation will occur migration between Isat and Tsel. Seen from the three consolidation scenarios, shows that scenario II provides the smallest spectrum deficit and large bandwidth occupancy.
3. Analysis of Consolidation

Three existing consolidation scenarios will be analysed covering operational and financial aspects. Operational aspects include the number of users and the number of base stations. Financial aspects include current ratio, cash ratio, debt to asset ratio, net profit margin, operating profit margin, return on assets, accounts receivable turnover, total assets turnover, and turnover of fixed assets.

3.1. Operational Aspect Analysis

3.1.1. Number of users. Based on number of users, in the scenario I, the difference number of users between the two consolidations has tended to decrease in the last three years and the difference in the number of users in this scenario is projected to decrease. In the scenario II, The number of consolidated users between Tsel+Isat is increasing every year and it is projected that it will increase significantly, while the consolidated users between XL+H3I have not increased. While in the scenario III, The difference in the number of users of operators in this consolidation scenario is not too far, but based on the results of projections in the coming years the difference in the number of users will be even greater. It can be concluded that consolidation scenario I provides a stable balance of the number of users.

3.1.2. Number of base station. Based on number of base stations, in the scenario I, the number of base stations in the consolidation between Tsel+XL has increased sharply each year and is projected to increase significantly. While the number of base stations resulting from the consolidation between Isat+H3I did not show a significant increase. In the scenario II, the difference in the number of base stations between each consolidation scenario tends to be small. However, based on the results of the
projection, the difference in the number of base stations on this scenario will increase every year. While in the scenario III, the difference in the number of base stations between each consolidated scenario tends to be small and based on the results of the projections, the difference in the number of base stations owned by each scenario is also not too lame. It can be concluded that consolidation scenario III provides a balance of the number of base stations.

3.2. Financial Aspec Analysis

3.2.1. Current ratio. In the scenario I, consolidation between Tsel+XL has a high current ratio, but the ratio tends to decrease until 2025. While the current ratio on the consolidation between Isat+H3I shows fluctuating results, it is predicted that it will also tend to decrease although not significantly. While in the scenario II, the level of liquidity between the Tsel+Isat consolidation scenario is high and is projected to tend to increase in the following years. However, the consolidation between XL+H3I has a low level of liquidity and is also projected to decrease. While in the scenario III, The current ratio difference in each consolidation is not too large and is projected to decline in subsequent years. The level of liquidity of each consolidation is more balanced.

3.2.2. Cash ratio. In the scenario I, the consolidation between Tsel+XL has a high cash ratio and is projected to increase. While the cash ratio on the consolidation between Isat+H3I shows a low level of liquidity. While in the scenario II, The consolidation between Tsel+Isat has a high cash ratio and is projected to increase. While the cash ratio on consolidation between XL+H3I shows a low level of liquidity. In the scenario III, the cash ratio difference in each consolidation is not too large and tends to fluctuate. However, if it is projected, the level of liquidity in Tsel+H3I will increase, while Isat+XL will decrease.

3.2.3. Debt to asset ratio. In the scenario I, The debt consolidation ratio between Isat+H3I is high and tends to increase. While the debt ratio in the consolidation of Tsel+XL is not too high and is also predicted to decline. While in the scenario II, The debt consolidation ratio between XL+H3I is high and it is also predicted to increase. While the debt ratio in the consolidation of Tsel+Isat is not too high and is predicted to decrease. In the scenario III, The second debt consolidation ratio has a nearly balanced value. Based on the results of forecasting the value of the Isat+XL debt ratio will tend to decrease but Tsel+H3I will increase.

3.2.4. Net profit margin. In the scenario I, The consolidation between Tsel+XL receives high margins and is predicted to increase every year. However, the consolidation between Isat+H3I experiences a minus margin value (loss) and is predicted to increase in the future. While in the scenario II, the consolidation between Tsel+Isat receives high margins and is predicted to increase every year, and consolidation between XL+H3I experiences a minus (loss) margin value and is also predicted to increase. And the difference in the both margins of consolidation tends to be more balanced. In the scenario III, Both consolidations will experience an increase in net profit. The level of profitability of Tsel+H3I will far exceed the level of profitability of Isat+XL.

3.2.5. Operating profit margin. In the scenario I, The consolidation between Tsel+XL receives high margins and is predicted to increase every year. However, the consolidation between Isat+H3I experiences a minus margin value (loss) and is predicted to increase in the future. While in the scenario II, the consolidation between Tsel+Isat has high margins and is predicted to increase every year, and consolidation between XL+H3I has a minus margin but is predicted to increase. The margin of both consolidation tends to be more balanced. In the scenario III, both consolidations have an increasing trend. Both consolidations are also predicted to experience an increase in operating profit. However, the level of profitability of Tsel+H3I will far exceed the level of profitability of Isat+XL.

3.2.6. Return of assets. In the scenario I, the consolidation between Tsel+XL is able to generate profits and it is predicted that this ratio will increase in the coming years, while the consolidation between Isat+H3I has a minus ratio figure but it is projected to increase in the future. While in the
scenario II, the consolidation between Tsel+Isat is able to generate profits and it is predicted that this ratio will increase in the coming years, while the consolidation between XL+H3I has a minus ratio number and is predicted to increase. In the scenario III, the consolidation between Tsel+H3I and Isat+XL has projected results that increase every year but increase in the consolidation between Isat+XL cannot compensate for the increase achieved by the Tsel+H3I consolidation so that in the years to come, the difference in capability between these two consolidation scenarios will widen.

3.2.7. Account receivable turnover. In the scenario I, Tsel+XL consolidation has a high receivables turnover ratio while Isat+XL and is predicted to experience an increase together. However, the increase in Isat+H3I consolidation cannot compensate for the Tsel+XL consolidation. While in the scenario II, the consolidation between XL+H3I has a ratio of accounts receivable turnover which tends to increase and is projected to increase every year. But on the contrary with the consolidation between Tsel+Isat which is predicted to be likely to remain. In the scenario III, the consolidation between Tsel+H3I has high accounts receivable turnover and tends to increase. and is predicted to increase every year. But on the contrary with the consolidation between Isat+XL which is predicted to be likely to remain.

3.2.8. Total assets turnover. In the scenario I, the consolidation between Tsel+XL has a high total asset turnover and is predicted to increase every year. While the consolidation between Isat+H3I has a low total asset turnover, it tends to increase and is predicted to increase in the future. While in the scenario II, the consolidation between XL+H3I has a total asset turnover which tends to increase is predicted to increase every year. But on the contrary the consolidation between Tsel+Isat has a total asset turnover which is predicted to decrease. In the scenario III, both consolidations have a total asset turnover that tends to increase predicted to increase every year and the second trend of the consolidation shows a similar trend.

3.2.9. Turnover of fixed assets. In the scenario I, the consolidation between Tsel+ISAT has good fixed asset turnover and is projected to increase. While the consolidation between XL+H3I has a low ratio and is projected to decline. While in the scenario II, the consolidation between Tsel+XL has a high fixed asset turnover and is projected to increase. The consolidation between ISAT+H3I has a lower ratio and tends to be fixed. In the scenario III, both consolidations have fixed asset turnover which tends to increase and is projected to increase every year and is expected to become balanced.

It can be concluded that scenario II provides a balance level of profitability to the operators. While scenario III provides a balance in terms of liquidity, solvency and activity.

4. Conclusion
The consolidation scenario which shows the balance of the number of users is the consolidation scenario in scenario I, which is the consolidation between Tsel+XL and Isat+H3I. The consolidation scenario which shows the balance of the number of base stations is the consolidation scenario in scenario III, which is the consolidation between Tsel+H3I and Isat+XL. In the analysis conducted on financial aspects, the consolidation scenario which shows a balance of ability in the level of profitability is a consolidation scenario in scenario II, which is between Tsel+Isat and XL+H3I, but a consolidation scenario that shows a balance in terms of liquidity, solvency and activity, namely the consolidation scenario in scenario III is the consolidation between Tsel+H3I and Isat+XL.

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