

MOBILE OPERATORS NEED SPECTRUM

Valuing mobile spectrum in
the midst of a pandemic

2020

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VALUING MOBILE SPECTRUM IN THE MIDST OF A PANDEMIC

THE ADVENT OF 5G SERVICES

There is a lot of excitement surrounding the advent of 5G mobile services. This is because 5G could be used both to boost existing mobile broadband services, and to support new use cases, including automated cars, smart cities, augmented reality and industry automation. These applications will open up new potential business opportunities for mobile operators. However, there is, at the same time, considerable uncertainty about the business models that will underpin these use cases. How, therefore, should operators value the spectrum that will enable them to launch 5G services, especially in light of the even greater economic uncertainty caused by Covid?

HOW SHOULD SPECTRUM BE VALUED GIVEN COVID-19?

Numerous 5G spectrum awards are scheduled over the coming year, which means that operators and regulators will be forced to estimate the value of the licenses on offer despite the huge uncertainty created by the COVID-19 outbreak.

Operators have had to bid for spectrum during tough economic times in the past - many 4G auctions took place around the time of the financial crisis. However, 5G will ultimately represent much more of a technological step change than 4G. That will make determining the value of 5G probably even more difficult than it was for 4G.

TYPICALLY, THERE ARE THREE WAYS OF THINKING ABOUT SPECTRUM VALUE

Although operators may have bespoke valuation models, it is possible to identify three main approaches to spectrum valuation:

- Discounted Cash Flow (DCF) modelling. Operators can derive the value of spectrum by estimating its effect on discounted cash flows, which will be a function of the impact on both incremental costs and revenues .
- Benchmarks. Operators often use benchmarks from other countries to estimate the value of spectrum on a per MHz

EXEC SUMMARY

Mobile operators need spectrum to be able to deliver 5G services. A significant amount of this spectrum will be auctioned off over the next few years. Typically, successful bidders are awarded licences for up to 25 years. Therefore, operators will need to determine the long-term value of the spectrum up for grabs when deciding on their bidding strategy. Even under normal circumstances, this is no mean feat. However, COVID-19 has ramped up the uncertainty, making it even trickier for operators to arrive at a valuation. As set out in this article, this heightened uncertainty is likely to increase the need to take into account the role of real options when valuing spectrum.

per population basis . This approach can produce quite a sizeable valuation range because the amounts paid depend on the auction rules and conditions of the country in question.

- Real options valuation. Operators can use a real options valuation to take into account the flexibility they have over when and how to deploy the acquired spectrum. This can reflect the fact that in reality, operators don't have to make a definitive decision about how they will use 5G spectrum for the next 25 years - they can use it flexibly depending on how demand evolves.

As we set out below, the advent of Covid is likely to increase the importance of considering real options valuation.

COVID-19 HAS RAMPED UP THE UNCERTAINTY

The pandemic makes demand for 5G services even more uncertain. On balance, there appears to be a risk that demand could be dampened, although there are a number of offsetting effects:

- COVID-19 has had a dire short-term impact on the economy, but opinions differ greatly about the likely shape of the recovery (e.g. V-shaped vs U-shaped vs L-shaped) .
- In general, people have relied heavily on telecoms during lockdown, turning especially to fixed services. As a result, COVID-19 has had less impact on telecoms demand than on the broader economy . Despite this, there is still a question as to what extent the increased reliance on telecoms services will feed through into higher demand for 5G, especially as new technologies typically suffer more during recessions than more basic services.

THE MEDIUM TERM IS KEY TO VALUING 5G SPECTRUM

Forecasts for the first 10 years are usually the most important in DCF modelling, as any later years are quite heavily discounted. Given that it will take time for users to acquire 5G-compatible handsets, the value of 5G spectrum is unlikely to be that high in the short term regardless of how the wider economy fares. For example, before the full effects of the pandemic became clear, the GSMA forecast that it would take five years before 5G accounted for 20% of connections globally (34% of connections in Europe) . As a result, the most important period for determining the value of 5G spectrum is likely to be the medium term because it represents a sweet spot between:

- Cashflows not being overly discounted; and
- A significant number of users having upgraded to 5G-compatible handsets.

That being the case, COVID-19 will likely make a big difference to the value of 5G spectrum only if the impact of the virus on the economy and 5G demand in particular persists for a number of years. And for now, that is unknown.

DOES 5G SPECTRUM HAVE OPTION VALUE?

The coronavirus crisis has widened the range of scenarios that need to be modelled when trying to estimate the value of spectrum. This can be done within a DCF framework. One possibility is to run a number of different simulations to get a better sense of the distribution of possible spectrum values . However, DCF modelling (even with simulations) is still a static analysis that fails to incorporate the option value of spectrum. Put another way, DCF modelling implicitly assumes that management is passive - once an investment decision is made, it can be argued that the assumption is that the business plan is executed as set out in the forecast.

STAYING FLEXIBLE

In contrast, operators may adjust their business plans over time depending on how demand evolves. They could do so in the following ways:

- **Slow the speed of 5G roll-out.** Subject to coverage obligations and ‘use-it-or-lose-it’ requirements, operators may have the option to delay the deployment of new spectrum until there is more certainty about the nature of demand . Alternatively, they may consider a partial roll-out. For example, they could deploy 5G services for urban customers while delaying the decision whether to expand into rural areas until the demand picture is clearer.
- **Accelerate 5G roll-out.** If demand turns out to be higher than expected, operators could roll out 5G more quickly than their original business plan envisaged.
- **Readjust the use of spectrum.** Operators may be able to tweak how they split their spectrum holdings between different use cases over time, depending on how demand develops.

VOLATILITY INCREASES OPTION VALUE

Having these options increases the value of spectrum. That is because options always have a value greater than zero. And importantly, the greater the uncertainty the higher the option value of acquiring spectrum. This means that 5G spectrum may have a greater option value than that of spectrum awarded previously to mobile operators.

As a result, it is possible that ignoring the option value may result in an underestimation of the value of 5G spectrum, especially because the value is likely to be driven mainly by cashflows generated in the medium term, by which stage operators may wish to modify their original business plans.

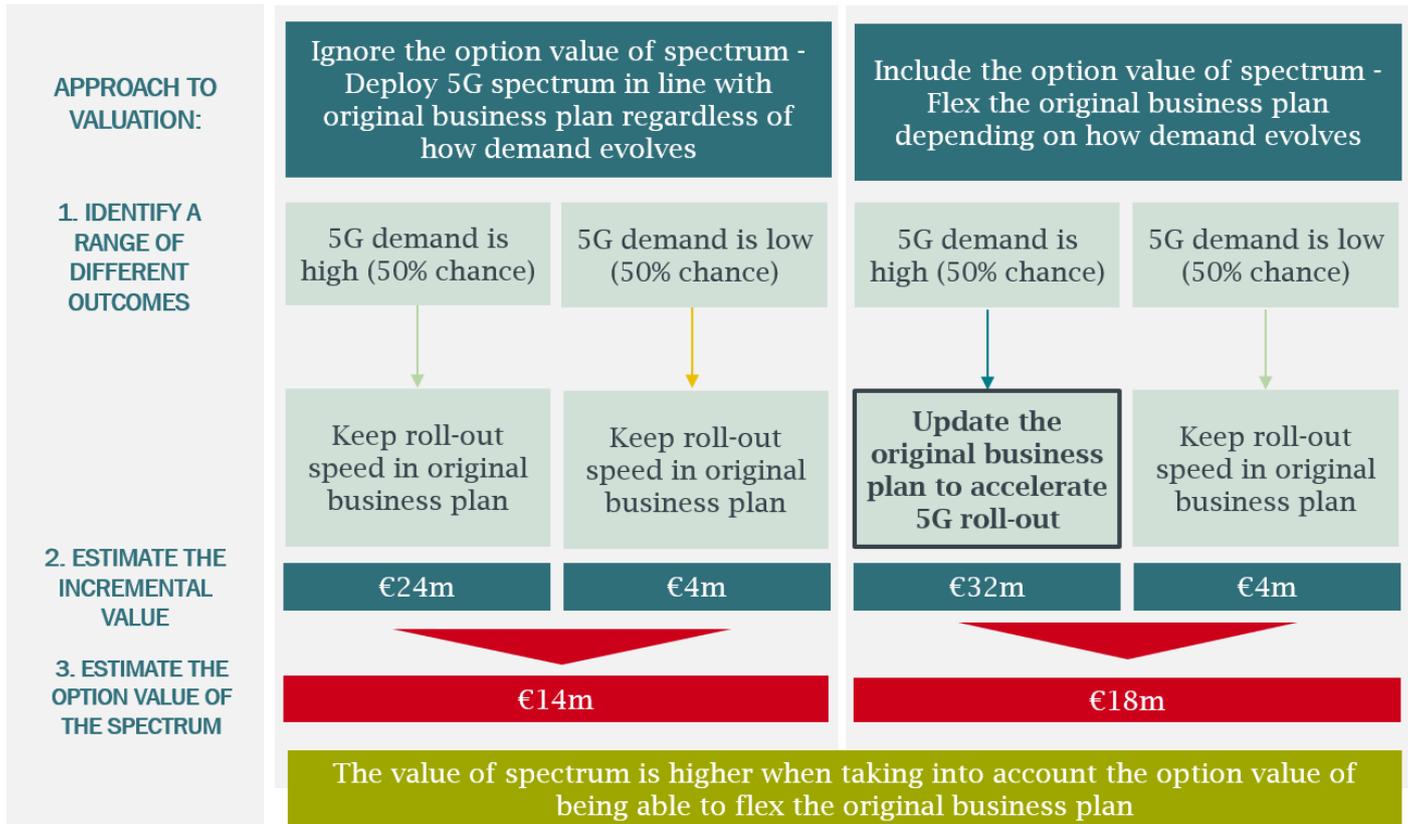
ESTIMATING THE OPTION VALUE OF SPECTRUM IN PRACTICE

The Black-Scholes model provides a framework for valuing options, which requires a reliable estimate of volatility over time. As this is not available, the most pragmatic approach is to use a ‘decision tree’. This requires a number of steps:

- 1 Identifying a range of different outcomes (e.g. demand for 5G turns out to be high/low) with a probability attached to each outcome.
- 2 Estimating the incremental value of the spectrum under each outcome relative to not having the spectrum.
- 3 Estimating the option value by considering how flexibility will allow operators to maximise the value of the spectrum in each scenario, e.g. accelerating some investments if demand turns out to be high. The estimate of the option value will also need to take into account how other operators will respond to different scenarios - even if demand for new applications is higher than expected, stiff competition may constrain margins.

The figure below provides an illustrative example of how a decision tree could be applied. Under a static DCF approach, the 5G spectrum would be valued at €14m . However, the figure rises to €18m once account is taken of the option value of accelerating the deployment of 5G spectrum in response to a higher than expected level of demand. This is because it includes the value to a provider of being able to respond to demand if 5G proves more successful than expected.

FIGURE 1 OPTION VALUE OF ACQUIRING 5G SPECTRUM



Source: Frontier Analysis

CONCLUSION

Many operators will be facing the difficult decision of how to value 5G spectrum. This is because there is a wide range of scenarios for how the appetite for 5G services will turn out, both at an aggregate level but also in terms of the relative demand between various use cases. Therefore, the traditional approaches to valuations may need to be expanded, to consider, in particular, how operators would respond in terms of network roll-out and investment as more information about 5G demand comes to light.

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