



Portuguese Telecom Services

A worsening outlook

Fundamentals in the Portuguese market are sound so far, yet the outlook is, in our view, deteriorating. First, according to its management, Nowo now plans to become a full-fledged national player. Second, the telecom regulator's 'pro consumer' rhetoric has stepped up and it seems ready to use the upcoming 5G spectrum auction to facilitate a change in the market structure. We are uncertain about the business case for a fourth player in Portugal but see downside risk for existing players. We cut our mid-term estimates for NOS and our PT from EUR6.0 to EUR5.0. We remain UW.

5G auction/Regulator pro-consumer rhetoric. Portugal will hold 5G spectrum auctions in 2020 on the 700MHz and 3.6GHz bands. Not all the details are finalized and the regulator has flagged it would like to use the auction to facilitate more competition, through possibly reserving spectrum to new entrants and/or imposing roaming obligations on 5G. More generally, the regulator considers the level of competition to be insufficient and prices too high (unlike our view as we discuss in the report).

Nowo (not covered) - New shareholders, new strategy. With new shareholders (Masmovil, GAEA), management has indicated that Nowo wants to become a full-fledged operator. Opportunities exist: on the infrastructure we note that Altice FTTH is willing to wholesale capacity to third parties and that there is now large portfolio of towers held by an independent company. In terms of market, ARPU are relatively low in Portugal and the three existing players have well invested fixed and mobile assets. However, as implied by statements made by the CEO, Nowo only wants to take c. 0.5m customers in a market that is still growing and prices are not very differentiated between existing players. Nowo may be able to develop a position at the lower end of the market.

Cutting estimates: We cut mid/long-term estimates for NOS and now expect flat revenues for 2019e-2024e (revenues/EBITDA 3Y /5Y CAGR of c. +0.5%/+1% as we expect Nowo to capture most of the market growth and caps upselling potential. Compared to the impact seen in other markets from the entry/change of strategy of a player, this assumes a relatively limited impact. We cut our NOS PT from EUR6 to EUR5 and remain UW. The shares are trading on 2020e EV/EBITDA 6.7x, EFCF 5.7%, unlevered FCF yield of 4.7% vs peers on 7.5x, 6.8% and 5.1%. Positively NOS has an attractive DY of 8% (c. 3.5% for peers). For Altice (Portugal is c. 15% of the EV) we leave our estimates as higher wholesale revenues could offset lower growth in retail.

Barclays Capital Inc. and/or one of its affiliates does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

This research report has been prepared in whole or in part by equity research analysts based outside the US who are not registered/qualified as research analysts with FINRA.

PLEASE SEE ANALYST CERTIFICATION(S) AND IMPORTANT DISCLOSURES BEGINNING ON PAGE 26.

INDUSTRY UPDATE

European Telecom Services

NEUTRAL

Unchanged

For a full list of our ratings, price target and earnings changes in this report, please see table on page 2.

European Telecom Services

Mathieu Robilliard

+44 (0)20 3134 3288

mathieu.robilliard@barclays.com

BBI, Paris

Maurice Patrick

+44 (0)20 3134 3622

maurice.patrick@barclays.com

Barclays, UK

Simon Coles, CFA

+44 (0)20 3555 4519

simon.aa.coles@barclays.com

Barclays, UK

Titus Krahn

+44 (0)20 7773 0469

titus.krahn@barclays.com

Barclays, UK

Tavy Rosner

+972 3 623 8628

tavy.rosner@barclays.com

Barclays, UK

Ganesh Nagesha

+91 (0)22 6175 1712

ganesh.nagesha@barclays.com

Barclays, UK

Summary of our Ratings, Price Targets and Earnings Changes in this Report (all changes are shown in bold)

Company	Rating			Price Target				EPS FY1 (E)			EPS FY2 (E)		
	Old	New	Date	Price	Old	New	%Chg	Old	New	%Chg	Old	New	%Chg
European Telecom Services	Neu	Neu											
NOS (NOS PL / NOS.LS)	UW	UW	23-Jan-2020	4.89	6.00	5.00	-17	0.32	0.30	-6	0.38	0.38	-

Source: Barclays Research. Share prices and target prices are shown in the primary listing currency and EPS estimates are shown in the reporting currency.

FY1(E): Current fiscal year estimates by Barclays Research. FY2(E): Next fiscal year estimates by Barclays Research.

Stock Rating: OW: Overweight; EW: Equal Weight; UW: Underweight; RS: Rating Suspended

Industry View: Pos: Positive; Neu: Neutral; Neg: Negative

Valuation Methodology and Risks

European Telecom Services

NOS (NOS PL / NOS.LS)

Valuation Methodology: We use a DCF and SoP based valuation for NOS, assuming an 7.5% WACC and 1% terminal growth rate for the domestic business.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Key upside risks: The regulator returns to a more pro-investment stance. Nowo's new strategy is unsuccessful.

Source: Barclays Research.

Spectrum auction and regulatory noise

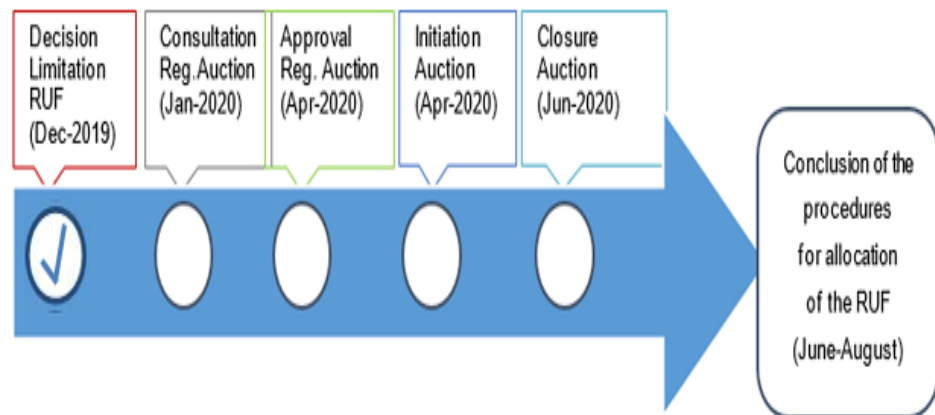
Portugal will hold 5G spectrum auctions in 2020. Spectrum on the 700MHz and 3.6GHz bands will be sold for 5G, together with some residual spectrum in other bands that are already being used with other technologies. Not all the details are yet known and the regulator has flagged it would like to use the auction to facilitate more competition, as it may reserve spectrum for new entrants or/and impose roaming obligations on 5G.

Separately, the regulator’s rhetoric about, in its view, insufficient competition in Portugal continues to step up, creating uncertainty about potential measures to increase competition. We fundamentally disagree with the regulator’s view: The absolute level of prices is at the lower end of European prices, there has been material network investment, ROCEs are low vs European peers. Yet as in other European countries, the pro-consumer/pro-competition mantra is not abating and even continues to rise. This makes for a paradox: Telecommunications are increasingly essential in consumer’s lives and to drive productivity in the economy, but pricing power and spending per capita continue to be under pressure and industry fragmentation increases. In our view, this is largely due to regulatory intervention and stands out when compared to most other European sectors (utility prices are rising, for example).

Historically, the Portuguese regulator’s approach has been relatively balanced between pro-investment/pro-consumer, which had enabled a rational market and high investments notably in FTTH. This equilibrium now looks to be at risk, an unfortunate development when critical 5G investment needs lie ahead.

5G spectrum auction

FIGURE 1
5G spectrum auction timeline



Source: Anacom

As can be seen in the figure above, the spectrum auction is expected to take place between April-June 2020. The key elements are the following:

- 400MHz spectrum auctioned in 3.6GHz. Unlike the initial draft, no lots will be reserved for regional lots. On this band Dense Air will see its blocks reduced from 168MHz to 100MHz in zones 1 and 2, 55MHz in zones 3 to 8 and none in zone 9. By 2025 Dense Air will lose its spectrum that will be allocated to the winning bidders of the auction.
- The regulator has publicly indicated (see [here](#) - Jornal Economico, 20 January 2020) that it could reserve part of the spectrum auctioned to new entrants, impose roaming

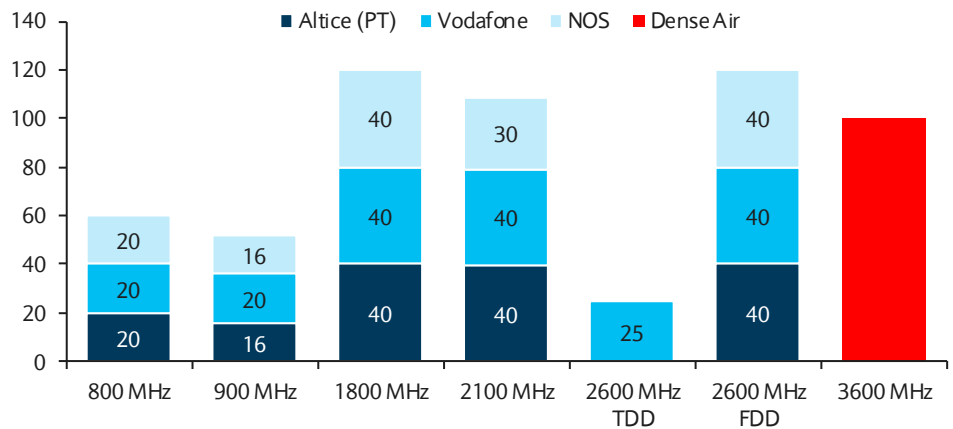
and MVNO obligations to the winning parties of the 5G auction and implement spectrum caps on the auction.

FIGURE 2
Spectrum auction

Bands	Quantity of Spectrum	Lot Size
700 MHz	2 x 30 MHz (FDD)	2 x 5 MHz
900 MHz	2 x 5 MHz (FDD) + 2 x 3 MHz (FDD) + 2 x 1 MHz (FDD)	2 x 5 MHz and 2 x 1 MHz
1800 MHz	2 x 15 MHz (FDD)	2 x 5 MHz
2.1 GHz	2 x 5 MHz (FDD)	2 x 5 MHz
2.6 GHz	2 x 10 MHz (FDD) + 25 MHz (TDD)	2 x 5 MHz , 25MHz
3.6 GHz	400 MHz (TDD)	10 MHz (national)

Source: Anacom

FIGURE 3
Portugal: Spectrum assets



Source: Anacom

Rising pro-consumer rhetoric

Throughout 2019, the head of Anacom, Mr Joao Cadete de Matos, has made numerous public comments regarding the state of competition in Portugal. Specifically, during his speech at the 29th Digital Business Congress on 20-21 November 2019, he flagged that Anacom’s analysis suggested that telecom prices in Portugal had increased by +12.5% over the past ten years vs a decline of 10.9% during the same period in the EC. This led him to conclude that one of the priorities of the regulator was to see a reduction in prices, along with improved quality of service.

All players in the Portuguese market have taken issue with this statement. From our point, two key elements need to be taken in to consideration: 1) The absolute level of ARPU in Portugal is actually among the lowest in Europe (only France is lower). 2) The revenues of the Portuguese telecom sector have declined over the past five years, as shown by the reports of Anacom itself (see [here](#) – Anacom, 15 November 2019).

In any case the regulator has launched 12 initiatives to foster more competition, one of which has been supported by the competition authorities on 9 December 2019 with a focus to reduce the minimum contract and generally facilitate termination of contracts and the possibility for consumers to change provider.

Altice ready to wholesale its FTTH network

On 13 December 2019, Altice announced the sale of its Portuguese FTTH asset to Morgan Stanley Infrastructure Partners. The asset includes around 4.0m homes passed with FTTH by YE 2019 and the dark fibre asset. The deal values the EV of the entity at EUR4.6bn, a 20x EV/19E EBITDA multiple (EBITDA of EUR237m). Payment is spread between 2020 (EUR1,565m), 2021 (EUR375m) and 2026 (EUR375m), with the last part subject to some performance elements.

With the limited details that have been disclosed and based on published and estimated figures for Altice FTTH assets, we estimate that the wholesale prices that Altice will pay are around EUR15 per month per line. This would be at the lower end of the European range (EUR15-20) and relatively inexpensive considering retail prices in Portugal (EUR20 for naked FTTH, EUR39 for 2 Play (FTTH + voice) and EUR 35-45 for 3P (FTTH + Voice + >100 Free TV channels). This offer will be available to third parties and could be taken by the number four player (Nowo), which has limited own coverage in Portugal (c.1.0m).

We show below our assumptions regarding the potential level of the wholesale fees, wholesale lines, other revenues and EBITDA margin to arrive at the EBITDA that the company has guided to (EUR237m).

FIGURE 4
Assumptions on Altice FTTH Portugal

Altice Portugal FTTH	Sce 1 % rev		Sce 2 % rev		Sce 3 % rev	
FTTH lines – 000s	1,200		1,300		1,400	
Wholesale FTTH ARPU – EUR	16.0		15.0		14.5	
EURm						
FTTH revenues	230	70%	234	70%	244	71%
Other wholesale	100	30%	100	30%	100	29%
Total revenues	330		334		344	
EBITDA margin	72%		71%		69%	
EBITDA	237		237		237	

Source: Barclays Research estimates

For Morgan Stanley IP, despite the high apparent multiple, we can see the attractiveness of the deal: 1) We estimate Altice FTTH is paying EUR15 per month (and prices are CPI-linked). 2) The number of lines should grow (we estimate from 1.1m to 1.4m). 3) The EBITDA margin is typically c.70% on these businesses but can ramp up to 75%+. 4) The maintenance capex should be low (less than 10% of revenues). 5) The cost of funding is probably quite low given the high visibility of the revenue stream.

We show below our estimate for the value of the business: We arrive at c.EUR5bn, i.e. close to the valuation that Altice achieved (EUR4.6bn).

FIGURE 5

Valuation of Portuguese FTTH company

	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Homes passed – FTTH	4,139	4,204	4,204	4,204	4,204	4,204	4,204
FTTH lines wholesaled	1,200	1,200	1,300	1,400	1,500	1,550	1,600
ARPU (EUR)	15.0	15.2	15.3	15.5	15.6	15.8	15.9
FTTH revenues	216	218	230	250	272	289	301
Other revenues	100	105	110	116	122	128	134
Total revenues	316	323	340	366	393	416	435
margin	71%	72%	73%	74%	74%	74%	74%
EBITDA	224	233	248	271	291	308	322
Capex	125	39	27	29	31	33	35
OpFCF	99	194	221	242	259	275	287
DCF		153	174	191	205	217	227
Wacc	5.0%						
g rate	1.0%						
EV	5,006						

Source: Barclays Research estimates

Nowo (not covered): New shareholders, new ambitions

Nowo: The fourth player

On 20 August 2019, Masmovil and GAEA Inversion announced the acquisition of Cabonitel, who owns the telecom operators Nowo and Oni, from KKR. The Competition Authorities approved the deal on 15 October 2019. Masmovil indicated it paid EUR15m for a minority stake but there are no more details on the deal.

Nowo results from the merger of Cabovisao (second largest cable operator) and Oni (B2B telecom) after Altice sold Cabovisao to Apax as part of the requirements imposed by the EC when Altice acquired PT. Apax then sold Nowo to KKR in Q4 2018.

Nowo has a CATV network with 900k homes passed and c. 14,000km of fiber/cable covering 18% of the country. It fully completed its DOCSIS 3.0 upgrade ten years ago but it is unclear how much has been done in terms of DOCSIS 3.1 upgrade.

It is Portugal's fourth largest telecom operator. According to regulatory data, in B2C it has c. 160k subscribers and sells Broadband, Pay TV and fixed telephony services as well as mobile services as an MVNO. Nowo's market share of broadband subscribers is approximately 4%, in Pay TV c. 5% and in mobile c. 2%. According to the regulator in 2018 Nowo accounted for 2% of total revenues of the Portuguese telecom market and Oni for 0.1%.

New shareholders, new ambitions

Since the entry of Masmovil and GAEA, Nowo management has made a number of public statements indicating that the company wanted to become a fully-fledged national player:

- On 8 November 2019, CEO Miguel Venancio indicated in a [Press Release](#) that it wanted Nowo to become a national player providing the best customer experience. Carlos Conti from GAEA inversion joined Nowo BOD and indicated that it saw a great growth potential in Portugal and that GAEA was ready to invest to support the strategy.
- On 6 December 2019, in an interview to [Jornal Economico](#), the CEO indicated that it wanted to triple its Broadband market share to 12%, thanks to increase coverage to 3.5m homes. The company indicated it is in discussion with a fund, Digital Bridge, that is considering investing EUR0.5bn to deploy the network. An alternative could be to sign a wholesale deal with Altice Portugal FTTH (see pages 5-6) as the newly founded entity has announced it would be willing to sell wholesale services to all operators on similar same financial terms. In mobile, Nowo already has an MVNO deal with Altice but the CEO indicated that it could enter the 5G spectrum auction, depending on the conditions (spectrum reserved to new entrants? 5G roaming obligation?,...) that are still being defined by the regulator.

Market opportunity: Available infrastructure and potential space on the lower end

We look at the market opportunity for Nowo's stated plan to develop a more aggressive strategy. We note on the positive the availability of FTTH infrastructure on a wholesale basis as well as potentially mobile passive infrastructure. In terms of pricing and marketing, ARPU are relatively low in Portugal but volumes are still growing. At the lower end of the market, there could be room for Nowo, in our view.

A well invested market

The Portuguese market is already very well developed in terms of High Speed broadband with an 80% penetration compared to c. 30% in Europe. This has been driven by the fact that the three players have built largely competing networks. In mobile, there are three MNO with national networks that are primarily upgraded for 4G. Typically each operator network is based on c. 3,000 cell sites.

State of the fixed market

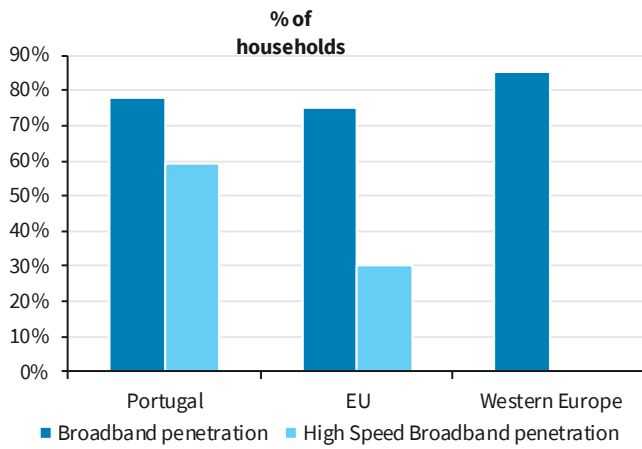
FIGURE 6

High Speed Broadband access in Portugal

In 000s	2017	2018	1H 2019
Population (e)	10,335	10,375	10,400
Households (e)	4,800	4,850	4,875
Homes (e)	6,302	6,325	6,324
High Speed BB homes passed	4,777	5,123	5,249
Penetration (homes)	76%	81%	83%
Broadband subscribers	3,575	3,785	3,868
Penetration (homes)	57%	60%	61%
Penetration (households)	74%	78%	79%
Broadband subscribers - Technology split	3,575	3,785	3,868
o/w DSL	750	607	542
o/w FTTH	1,381	1,711	1,863
o/w Cable	1,167	1,181	1,184
o/w Other (FWA, ...)	277	287	279
Broadband subscribers - Companies split	3,575	3,785	3,868
o/w Meo (Altice)	1,412	1,514	1,555
o/w NOS	1,333	1,389	1,392
o/w Vodafone	665	727	762
o/w Nowo-Oni	154	148	147
o/w Other	11	8	12

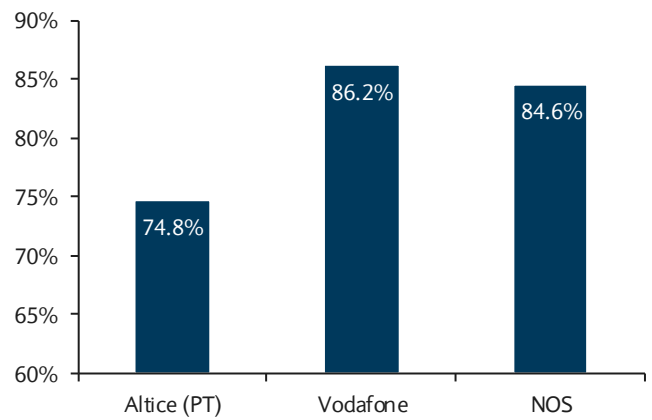
Source: Anacom, Companies, Barclays Research estimates

FIGURE 7
Broadband penetration in Portugal in line with EU but below Western Europe



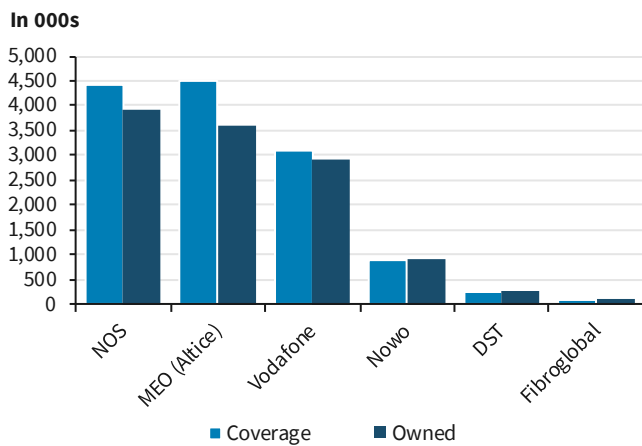
Source: EC, Anacom, Barclays Research estimates

FIGURE 8
Portugal: 4G availability



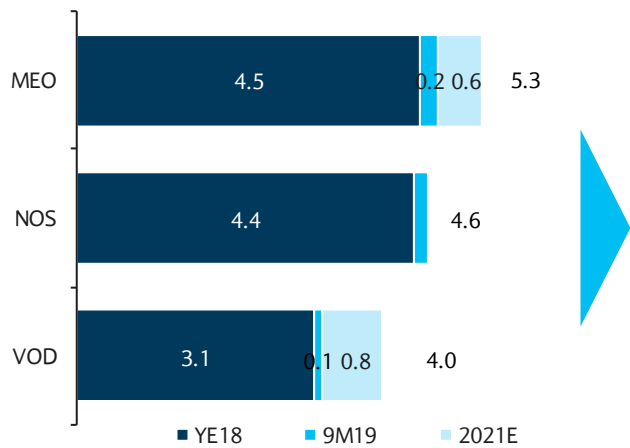
Source: Open Signal

FIGURE 9
Homes passed and owned – YE 2018



Source: Company reports, Barclays Research estimates

FIGURE 10
High Speed Broadband homes passed targets – In m

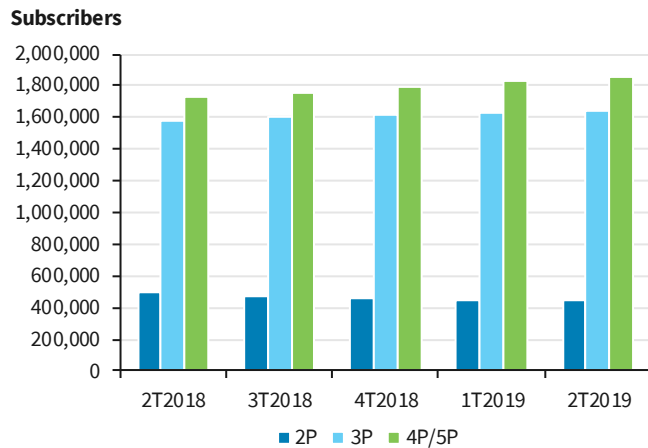


Source: Company reports, Barclays Research estimates

A largely convergent market

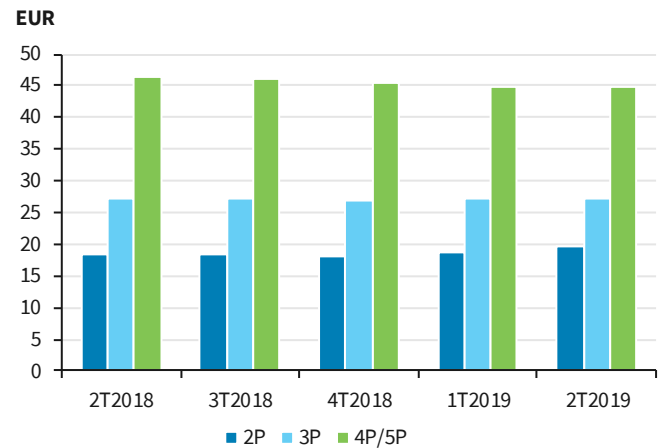
According to data from the regulator, consumers taking a multiplay/bundle offer represented 3.95m at Q2 2019. This compares with 3.9m broadband subscribers and 5.1m fixed lines in Portugal, suggesting very high penetration of bundles.

FIGURE 11
Subscribers subscribing to bundles *



Source: ANACOM * All offers have at least one fixed line product

FIGURE 12
Monthly ARPU per bundle *



Source: ANACOM, Barclays Research estimates* Only includes the monthly fee, not any revenues from extra option such as additional SIM cards, premium content

Nowo has not communicated on what segments it is likely to target with its new strategy, but the brand positioning seems to be focused on ‘transparency’ and ‘simplicity’. With no evident differentiation in terms of product available, it seems the company will be competing on price or value.

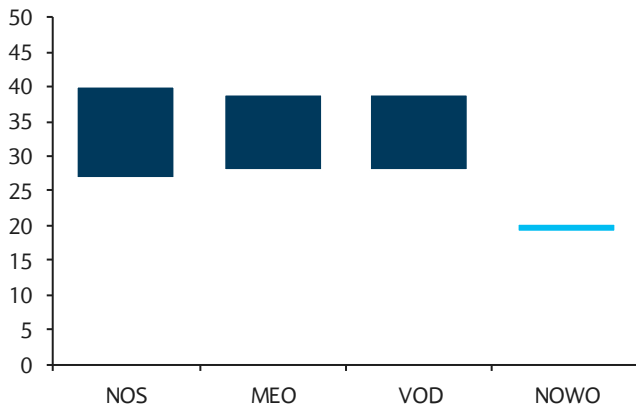
- Nowo wants to achieve a market share of 12% in Broadband, as indicated by its CEO.
- We still see potential for growth in Broadband penetration in Portugal (78% penetration vs 85% in Western Europe). The market is currently growing at c. 150k per year. Assuming this continues until 2025, penetration for the aggregate market will reach 90% in 2025.
- Based on a simple calculation, by 2025 Nowo’s 12% market share would represent c. 560k subscribers, equalling a net increase of c. 410k subscribers, i.e. 60% of the market subscriber growth between YE 2019 and YE 2025, all else equal in the industry.

Opportunity at low end in fixed

For double- and triple-play products in Portugal, the three established fixed operators price largely in line with each other whereas Nowo is undercutting the market to some extent, particularly with its naked retail FTTH offer. On the other hand, Nowo’s broadband subscriptions are limited to the lower end of the market in terms of speed and content.

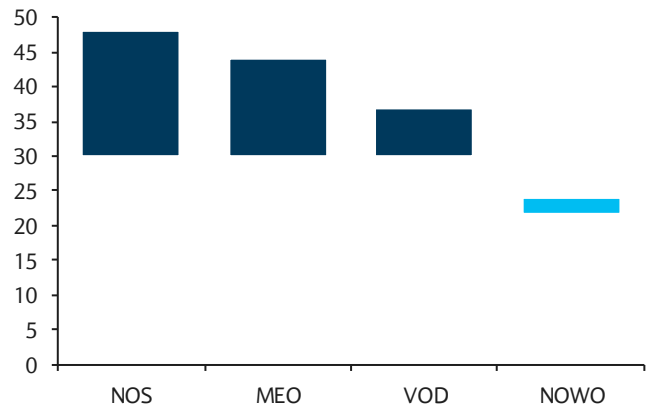
- Considering solely broadband tariffs which offer fiber-like speeds of at least 100Mbps, Altice, Vodafone and NOS all have a nearly identical price range in dual-play (which offers better comparability due to the varying TV content). Vodafone’s and Altice’s entry-level products (with 100Mbps) both price at around €28/month whilst NOS is slightly below but excludes a fixed voice connection. At the upper end, dual-play subscriptions with speeds of up to 1Gbps generally cost around €39-40/month.
- We note that NOS is the only one of the three operator that offers broadband-only tariffs to its customers (but no dual-play), which makes it directly comparable to Nowo.
- Nowo is pricing its broadband-only tariff at a considerably lower rate (€20/month) with an effective delta of around €8/month on a 24-months basis. However, Nowo’s broadband-only product offers a single speed of up to 120Mbps, making higher speeds not accessible on a non-bundled basis.

FIGURE 13
Portugal: Dual-Play (voice+ BB) Fiber pricing range – incl. VAT and promotions



Source: Barclays Research, Companies, Broadband-only tariffs for NOS/NOWO, including tariffs only with >100Mbps broadband speed

FIGURE 14
Portugal: Triple-Play (voice + BB+ TV) Fiber pricing range – incl. VAT and promotions



Source: Barclays Research, Companies, including tariffs only with >100Mbps broadband speed

- Comparing the range of triple-play, pricing in Portugal shows a similar situation. Whereas NOS, Altice and Vodafone apply the same prices to their entry-level tariffs, Nowo’s pricing is again noticeably lower. At the lower end, all three established providers offer bundles with speeds of 100Mbps at around €30/month, whilst higher-speed tariffs cost up to €48/month. The variation at the upper end should be mainly a result of different TV offerings (ranging from 140 to 180 channels for triple-play), in our view. Nowo’s entry-level tariff is considerably less expensive at around €22/month, but includes only 90 channels (with 120Mbps). Additionally, the operator does not offer a tariff that competes with the subscriptions at the upper end of the market. Nowo’s most expensive contract (€24/ month over a 24-month period) offers a limited bundle in terms of speed (up to 250Mbps) and TV content (90 channels).

What network strategy to follow?

Fixed: wholesale or extend the fixed network?

The ambition expressed by the CEO to increase coverage from 0.9m to 3.5m homes with a Broadband proposition can be achieved through different options as the company indicated:

1) Own build which the company estimates would cost EUR0.5bn, i.e. c. EUR200 per homes passed, broadly in line with what peers have achieved in the country. For the economics to work, the critical factor will be the take up rate, which may be a struggle since Nowo will be competing with three established brands. In any case Nowo has indicated it has found a financial partner that could finance the roll-out.

2) Wholesale access from an existing player. We note Altice FTTH Portugal is now a separate entity from Altice fixed retail and mobile operations and is willing to sell to third parties. We estimate its wholesale FTTH lines at around EUR15 per month. This price may only be offered in exchange for large volume commitments so a buyer may have to pay a higher price. Today Nowo has offers at EUR19 for broadband only at 12Mbps and EUR24 for Broadband/TV/Voice at 120Mbps. In our view, a wholesale price of say EUR16 per month would require to higher tariffs considering CPE/in house wiring costs of around EUR200 per subscriber.

Mobile strategy: MVNO or network build?

Nowo has an MVNO deal with Altice but has indicated it would look at the opportunities created by the 5G spectrum auctions, which may come with reserved spectrum and roaming obligations.

Typically each operator network is based on c. 3,000 cell sites. Built from scratch that would represent an investment for the RAN/passive infrastructure of only c. EUR450m and operating costs of c. EUR35m per year.

We also note that mobile data usage in Portugal is still quite low at 3.5GB per user per month.

Impact on competitors not expected to be material but caps growth

As discussed above, based on company commentary and simple calculations, Nowo could reach its subscriber objectives by capturing c. 60% of all estimated new subscribers until 2025. The strategy would be based on a lower price and may not affect the pricing of the other players. This, however, would mean very limited volume growth for the remaining players, if any, and potentially less ability to monetize and upsell data growth.

As a result, we cut our mid to long-term estimates for NOS revenues and now expect flat telecom revenues between 2019-2025 vs +1.5% CAGR previously. Compared to the development we saw in other markets after the entry of new players or a material change in strategy from a small player, this assumes a relatively limited impact.

For Altice we keep our estimates unchanged at this stage. If Nowo does decide to deploy its own infrastructure that would create downside to our Altice Portugal estimates where we expect a +1% revenue CAGR for 2019-2025e.

NOS - Changes in estimates and PT

We reduce our mid- to long-term revenue estimates for NOS from 2021E. This is driven by the Telco business as we incorporate limited volume growth potential as a result of Nowo's possible market share gain and possible negative impact on pricing power. We increase our revenues for the other divisions to reflect the good results in Q3.

Our lower telecom revenue estimates translate into lower EBITDA expectations, which we reduce by -1.9% for 2021E. We are in line with Bloomberg consensus for 2020e revenues and EBITDA but 2% below for 2021e. We now expect only a modest increase in DPS.

FIGURE 15

NOS: Changes to forecasts (€m, %)

	New			Old			Var (%)		
	2019E	2020E	2021E	2019E	2020E	2021E	2019E	2020E	2021E
Revenues	1,596	1,618	1,626	1,592	1,617	1,643	0.2%	0.1%	-1.0%
Telco	1,521	1,541	1,546	1,522	1,544	1,569	0.0%	-0.2%	-1.4%
Audiovisuals and Cinema	116	119	121	112	114	116	4.1%	4.1%	4.1%
Others	-42	-41	-42	-42	-41	-42	0.6%	0.1%	-1.0%
EBITDA	650	661	667	647	660	673	0.4%	0.1%	-0.9%
Net Income	155	196	215	164	195	209	-5.5%	0.6%	2.7%
EPS	0.30	0.38	0.42	0.32	0.38	0.41	-5.5%	0.6%	2.7%
DPS	0.36	0.37	0.38	0.36	0.40	0.40	0.0%	-7.5%	-5.0%
Capex incl. leases	436	420	401	429	408	402	0.0%	0.0%	0.0%
OpFCF excl leases	265	291	316	268	303	321	-1.4%	-3.9%	-1.6%
Net financial debt	1328	1535	1545	1331	1466	1502	-0.2%	4.7%	2.9%

Source: Barclays Research estimates

Valuation

We remain UW on NOS. We reduce our DCF and SoP-based PT to €5.0 p/s from €6.0 p/s. The reduction is mainly driven by lower estimates for the Telcos business but also due to higher estimates for spectrum spend (we increase from EUR120m to EUR200m assuming 100MHz at EUR0.1 for 3.5GHz and 20MHz at EUR0.5 for 700MHz).

FIGURE 16

NOS: DCF valuation inputs (€m)

Item	Value
EV Present	1,187
EV Terminal	3,469
EV consolidated	4,656
Vodafone wholesale	23
EV	4,757
Fin Net Debt	1,536
Equity value	2,582
NOSH	513
Target price	5.0
WACC	7.5%
G	1.0%
Terminal multiple	15.4

Source: Barclays Research estimates.

FIGURE 17

NOS: DCF (€m)

DCF	2020e	2021e	2022e	2023e	2024e	2025e
EBITDA	661	667	671	679	688	690
minus depreciation	-412	-396	-389	-379	-342	-257
EBIT	249	271	282	300	345	433
Tax	-52	-57	-59	-63	-73	-91
Tax rate	0	0	0	0	0	0
Noplat	197	214	223	237	273	342
minus capex	-370	-351	-331	-291	-280	-270
plus depreciation	412	396	389	379	342	257
Working capital	-15	-15	-10	-10	-5	-5
CF for discounting	223	244	270	315	331	324
Discount factor	0.00	0.93	0.87	0.80	0.75	0.70
Discounted CF	0	227	234	254	248	225

Source: Barclays Research estimates

On our new forecasts, NOS trades on 6.6x 2020e EV/EBITDA, 15.0x OpFCF and 5.7% EFCF. NOS trading multiples are summarised in the following table.

FIGURE 18

NOS: trading multiples (x, %)

	2018A	2019E	2020E	2021E	2022E	2023E
P/E (x)	17.9	16.3	12.0	10.0	8.9	7.5
EFCF yield (%)	4.6%	4.5%	5.7%	7.0%	8.8%	12.4%
Dividend yield (%)	7.1%	7.3%	8.1%	9.0%	10.2%	11.7%
TSR yield (%)	6.1%	7.1%	7.3%	8.1%	9.0%	10.2%
EV/EBITDA	6.7	7.1	6.7	6.4	6.1	5.7
EV/OpFCF	18.4	17.3	15.3	13.5	12.0	9.9
Unlevered FCF yield (%)	3.6%	4.2%	4.7%	5.4%	6.3%	7.8%

Source: Company data, Barclays Research estimates. Closing price 22 January 2020

NOS – Detailed Estimates and Valuation

FIGURE 19

NOS: Summary P&L forecast (€m)

P&L Statement	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E
Revenues	1,559	1,576	1,596	1,618	1,626	1,631	1,637	1,642
y/y (%)	3.1%	1.1%	1.2%	1.4%	0.5%	0.3%	0.3%	0.3%
Total Opex	-983	-984	-945	-957	-959	-961	-957	-954
EBITDA	575	592	650	661	667	671	679	688
margin (%)	36.9%	37.5%	40.8%	40.9%	41.0%	41.1%	41.5%	41.9%
D&A	-420	-390	-417	-412	-396	-389	-379	-342
Operating Income	155	202	233	249	271	282	300	345
Net other cost/(Income)	-16	-1	-15	0	0	0	0	0
Equity in loss / (Gain)	23	-6	3	4	4	4	4	4
EBIT	163	194	221	253	275	286	304	349
Net Interest	-24	-24	-25	-22	-25	-25	-24	-24
PBT	139	170	196	231	250	261	280	326
Tax expense	-16	-29	-42	-35	-35	-40	-45	-50
tax rate	11.9%	17.2%	21.2%	15.1%	14.0%	15.3%	16.1%	15.3%
Minority interest	-0	1	0	0	0	0	0	0
Net income	122	141	155	196	215	221	235	276
Basic EPS	0.24	0.28	0.30	0.38	0.42	0.43	0.46	0.54
Diluted EPS	0.24	0.28	0.30	0.38	0.42	0.43	0.46	0.54

Source: Company reports, Barclays Research estimates

FIGURE 20

NOS: Cashflow forecasts (€m)

Cashflow	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E
EBITDA	575	592	650	661	667	671	679	688
Capex	-377	-376	-386	-370	-351	-331	-291	-280
Non-cash EBITDA+WCAP	-23	-20	-15	-15	-15	-10	-10	-5
OpFCF	175	196	250	276	301	329	378	403
LT contracts	-15	-15	0	0	0	0	0	0
Cash interest	-21	-15	-18	-22	-25	-25	-24	-24
Cash tax	-17	-4	-12	-7	-25	-30	-35	-40
Other cash movements	27	-0	-7	0	0	0	0	0
LTE payments	0	0	0	0	0	0	0	0
Taxes paid	0	0	0	0	0	0	0	0
Cash restructuring costs	-16	18	-2	-4	-2	0	0	0
Others	0	0	-1	-200	-5	0	-56	0
FCF pre dividends	133	180	145	-22	179	209	198	275
FX effect	0	0	0	0	0	0	0	0
Financial investment	0	0	0	0	0	0	0	0
New debt	0	0	19	100	50	0	0	0
Acquisition of own shares	0	-3	-4	0	0	0	0	0
Dividends Paid	-103	-154	-180	-185	-190	-195	-200	-205
Total Free Cash Flow	31	23	-19	-107	39	14	-2	69
Cash SoP	2	3	2	51	-56	-16	-2	-5
Change in cash	31	23	-19	-107	39	14	-2	69
Other	-30	-24	68	0	0	0	0	0
Cash EoP	3	2	51	-56	-16	-2	-5	65

Source: Company reports, Barclays Research estimates

Altice – Estimates and valuation

Valuation and trading multiples

We value Altice at €4.15 per share and are UW.

FIGURE 21

Altice – DCF-based SOP (€m, except per share data)

SOP	EV	Stake	Value	EV/EBITDA 20e	EV/OpFCF 20e	'20E EBITDA	'20E OpFCF
France	26,045	93%	24,245	6.0x	13.6x	4,347	1,911
Portugal	7,483	67%	4,980	9.0x	17.4x	836	429
Israel (incl. optionalities)	2,000	100%	2,000	5.5x	16.4x	364	122
Dominican Republic	1,236	97%	1,201	5.0x	8.3x	247	149
Teads	1,619	100%	1,619	17.0x	20.6x	95	79
Others	-628	100%	-628	0.0x	14.3x	-44	-44
Total EV	71,283	47%	33,417	12.4x	27.9x	5,760	2,552
Net debt (YE20e)			-28,268				
Other Assets and Liabilities			98				
Pay TV liability			-212				
Minorities from deal (net)			2,199				
EU fine contingent liability			-124				
Tax assets (YE 20E)			0				
Future spectrum payment NPV			-2,053				
Pension liabilities Portugal			-769				
ATUS stake			406				
Equity value			5,246				
NOSH			1,257				
Value/share			4.2				
Non-vote discount			0%				
Altice TP			4.15				

Source: Company data, Barclays Research estimates, Altice USA valued at market price – closing 10 January 2020; valuation unchanged.

On our forecasts, we estimate Altice trades on 6.5x 2020E EV/EBITDA, 14.6x EV/OpFCF and a 3.9% unlevered FCF yield.

FIGURE 22

Altice – Valuation multiples (%x), rolling multiples

	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E
P/E (x)	(22.6)	3.5	(23.9)	21.0	6.8	5.5	4.6	4.1
EFCF yield (%)	-3.6%	-2.2%	3.9%	9.4%	13.1%	16.2%	16.5%	17.5%
Dividend yield (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TSR yield (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EV/EBITDA	8.0	6.9	6.5	6.1	5.9	5.5	5.4	5.1
EV/OpFCF	19.9	16.2	14.6	12.9	12.1	10.6	9.8	8.9
Unlevered EFCF yield (%)	2.2%	2.4%	3.9%	5.3%	6.3%	7.0%	7.4%	8.0%

Source: Company data, Barclays Research estimates, Stock price dated 22 January 2020, DY based on rolling EV

Financial forecasts

FIGURE 23

Altice – Revenue forecasts (€m)

Revenue	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E
France - Telecom	10,603	10,260	9,783	10,224	10,613	10,898	11,050	11,194	10,392	10,531
France - Media	376	443	458	437	450	459	468	478	487	497
Total Altice France	10,978	10,702	10,240	10,661	11,063	11,357	11,518	11,671	10,880	11,028
Portugal	2,188	2,142	2,075	2,099	2,117	2,138	2,155	2,173	2,191	2,209
Israel	955	1,036	941	959	978	969	972	983	998	1,012
Dominican Republic	666	630	554	560	541	539	543	551	558	566
Teads	0	164	365	468	515	566	594	624	655	688
Others	7	1	1	1	0	0	0	0	0	0
Total Altice International	3,816	3,972	3,935	4,087	4,151	4,212	4,265	4,331	4,402	4,475
Total Altice TV	0	28	119	244	255	160	30	0	0	0
Corporate and Other	78	23	4	0	0	0	0	0	0	0
Eliminations (Intra group TV)	-90	-123	-208	-276	-220	-170	-130	-120	-120	-120
Total Altice Europe	14,782	14,601	14,091	14,717	15,249	15,560	15,683	15,882	15,162	15,383

Source: Company data, Barclays Research estimates. Restatement of revenues pre FY2019.

FIGURE 24

Altice – Adj. EBITDA forecasts (€m)

Adjusted EBITDA	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E
France - Telecom	4,073	4,087	3,710	4,072	4,233	4,329	4,345	4,383	4,196	4,172
France - Media	53	74	76	110	113	117	120	124	128	131
Total Altice France	4,125	4,160	3,785	4,182	4,347	4,445	4,465	4,507	4,324	4,304
Portugal	1,080	949	840	839	836	849	862	869	876	883
Israel	432	474	406	362	364	361	362	366	371	377
Dominican Republic	377	349	286	272	247	241	243	246	249	253
Teads	0	39	60	83	95	110	126	136	143	150
Others	0	-0	-0	-0	0	0	0	0	0	0
Total Altice International	1,889	1,810	1,592	1,556	1,542	1,560	1,592	1,617	1,639	1,663
Total Altice TV	-103	-222	-227	-96	-85	-60	-80	0	0	0
Corporate and Other	-107	-89	-41	-32	-32	-32	-33	-33	-33	-34
Eliminations	-18	-14	-8	-9	-12	-3	-3	-3	-3	-3
Total Altice Europe	5,786	5,646	5,101	5,601	5,760	5,911	5,942	6,088	5,927	5,930

Source: Company data, Barclays Research estimates

FIGURE 25

Altice – Capex forecasts (€m)

Accrued Capex	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E
France - Telecom	2,335	2,299	2,136	2,161	2,190	2,140	2,115	2,030	1,781	1,699
France - Media	44	96	134	110	109	102	94	89	84	79
Total Altice France	2,378	2,394	2,270	2,271	2,299	2,242	2,209	2,119	1,865	1,778
Portugal	441	438	423	410	403	396	378	359	351	343
Israel	313	242	234	240	235	223	214	197	180	162
Dominican Republic	123	115	115	123	113	107	103	99	94	96
Teads	0	0	1	4	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
Total Altice International	877	794	774	777	751	727	695	655	625	601
Total Altice TV	441	47	1	8	0	0	0	0	0	0
Corporate and Other	0	15	0	0	0	0	0	0	0	0
Eliminations	-17	-11	-5	-6	0	0	0	0	0	0
Total Altice Europe	3,680	3,239	3,040	3,049	3,050	2,968	2,904	2,774	2,490	2,379

Source: Company data, Barclays Research estimates

FIGURE 26

Altice – P&L statement (€m)

	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E
Revenues	23,500	14,255	14,716	15,249	15,560	15,683	15,882	15,162
Opex	-14,087	-9,118	-9,122	-9,489	-9,649	-9,741	-9,795	-9,235
Adj. EBITDA	9,413	5,137	5,594	5,760	5,911	5,942	6,088	5,927
Stock option	-282	-43	-64	-66	-68	-70	-72	-74
Others	0	0	0	0	0	0	0	0
EBITDA	9,131	5,094	5,530	5,694	5,843	5,872	6,016	5,853
D&A	-6,961	-4,125	-4,600	-4,492	-4,080	-3,194	-2,983	-2,500
Restructuring & other	-1,221	457	3,432	0	0	0	0	0
EBIT	949	1,427	4,362	1,202	1,763	2,679	3,032	3,353
Gain on acquisition	0	0	0	0	0	0	0	0
Finance income	487	97	0	0	0	0	0	0
Finance costs	-4,338	-2,362	0	0	0	0	0	0
Net interest	-3,850	-2,265	-1,995	-1,581	-1,285	-1,119	-1,102	-1,070
Associate income	-23	-10	-123	0	0	0	0	0
PBT	-2,925	-848	2,243	-379	478	1,560	1,930	2,283
Income tax	2,730	-68	-77	38	-143	-468	-579	-685
Tax rate (%)	93%	-8%	3%	10%	30%	30%	30%	30%
Discontinued op.	0	712	0	0	0	0	0	0
Minority	-351	-128	-31	25	25	25	25	25
Net income	-546	-333	2,134	-316	360	1,117	1,376	1,623
Basic EPS	-0.46	-0.28	1.79	-0.26	0.30	0.94	1.15	1.36
EPS (adj)	0.81	-1.17	-0.98	-0.20	0.34	0.94	1.15	1.35
NOSH (Avg)	1,175	1,191	1,193	1,193	1,193	1,193	1,193	1,193
NOSH Diluted (Avg)	1,175	1,241	1,257	1,257	1,257	1,257	1,257	1,257
DPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Company data, Barclays Research estimates

FIGURE 27

Altice – Cashflow statement (€m)

	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E
Adj.EBITDA	9,413	5,137	5,594	5,760	5,911	5,942	6,088	5,927
Cash tax	-331	-145	-300	-350	-400	-468	-579	-685
Net WC	455	-334	-150	-76	-78	-78	-79	-76
Other	-1,472	198	250	0	0	0	0	0
OpCF	8,065	4,857	5,394	5,334	5,433	5,396	5,429	5,166
Capex	-4,450	-3,485	-3,472	-3,050	-2,968	-2,904	-2,774	-2,490
Other	-227	437	1,035	-599	-302	-123	-871	-23
Investing CF	-4,677	-3,049	-2,436	-3,649	-3,270	-3,027	-3,645	-2,513
Share issuance	328	0	0	0	0	0	0	0
Loan proceeds	14,777	6,271	6,283	0	0	0	0	0
Repayment of debt	-13,261	-7,154	-5,509	0	0	0	0	0
Distribution to CPEC's holders	0	0	0	0	0	0	0	0
Interest paid	-3,628	-1,936	-1,702	-1,460	-1,285	-1,119	-1,102	-1,070
Dividend payment	0	0	0	0	0	0	0	0
Minority dividend	-260	-21	-62	-85	-95	-105	-105	-115
Others	-1,256	1,834	-100	1,219	365	0	0	0
Financing CF	-3,299	-1,006	-1,091	-327	-1,015	-1,224	-1,207	-1,185
Forex & others	41	-204	-5	0	0	0	0	0
Free cashflow	-477	-834	-215	374	905	1,268	1,448	1,492
Cash SoP	1,109	1,239	1,837	3,699	5,058	6,205	7,350	7,927
Change in cash	130	598	1,862	1,358	1,147	1,145	577	1,469
Cash EoP	1,239	1,837	3,699	5,058	6,205	7,350	7,927	9,395

Source: Company data, Barclays Research estimates

European Telecom Services	Industry View: NEUTRAL
---------------------------	------------------------

Altice NV (ATCA.AS)	Stock Rating: UNDERWEIGHT
----------------------------	----------------------------------

Income statement (€mn)	2018A	2019E	2020E	2021E	CAGR
Revenue	14,255	14,716	15,249	15,560	3.0%
EBITDA	5,094	5,530	5,694	5,843	4.7%
EBIT	1,427	4,362	1,202	1,763	7.3%
Finance costs - net	-2,265	-1,995	-1,581	-1,285	N/A
Pre-tax income	-848	2,243	-379	478	N/A
Tax rate (%)	-8	3	10	30	N/A
Net income	-333	2,134	-316	360	N/A
EPS (adj) (€)	-1.17	-0.98	-0.20	0.34	N/A
Diluted shares (mn)	1,241.4	1,257.3	1,257.3	1,257.3	0.4%
DPS (€)	0.00	0.00	0.00	0.00	N/A

Price (23-Jan-2020) EUR 6.18
Price Target EUR 4.15

Why Underweight? We are UW on Altice, viewing the current value as discounting material value creation through strategic re-organisation, which is not guaranteed. We see scope for the equity to re-rate materially, however, should French M&A be forthcoming.

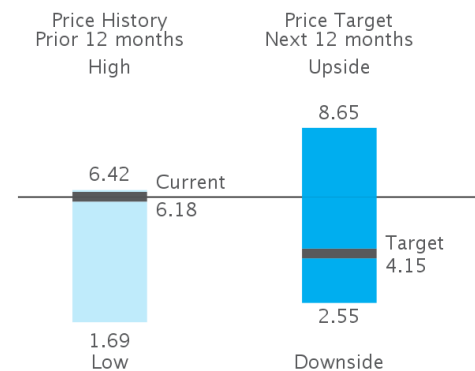
Upside case EUR 8.65

We assume that consolidation in the French market materialises and that Altice is also able to dispose of assets in Israel at values above expectations.

Downside case EUR 2.55

We assume that consolidation in the French market does not happen. We also assume no value creative asset disposal in Israel.

Upside/Downside scenarios



Margin and return data	Average				
EBITDA margin (%)	35.7	37.6	37.3	37.6	37.1
EBIT margin (%)	10.0	29.6	7.9	11.3	14.7
Pre-tax margin (%)	-6.0	15.2	-2.5	3.1	2.5
Net margin (%)	-2.3	14.5	-2.1	2.3	3.1
Operating CF margin (%)	11.6	14.4	17.8	18.9	15.7
ROCE (%)	1.9	2.8	3.0	3.3	2.7
RONTA (%)	4.5	11.1	14.6	16.4	11.7
ROA (%)	1.5	2.1	2.2	2.5	2.1
ROE (%)	79.9	39.4	31.6	-73.3	19.4

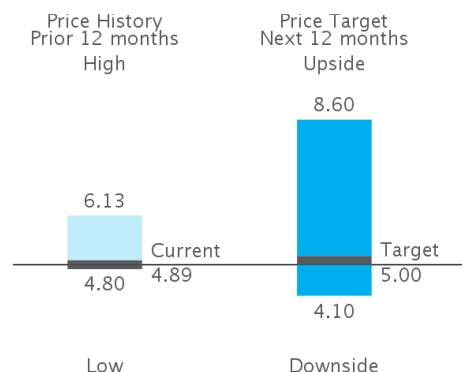
Cash flow and balance sheet (€mn)	CAGR				
Cash flow from operations	4,857	5,394	5,334	5,433	3.8%
Capex and acquisitions	-3,485	-3,472	-3,050	-2,968	N/A
Free cash flow	-834	-215	374	905	N/A
NOPAT	1,094	960	1,141	1,282	5.4%
Tangible fixed assets	10,009	9,967	8,525	7,414	-9.5%
Intangible fixed assets	24,420	23,606	23,606	23,606	-1.1%
Cash and equivalents	1,837	3,699	5,214	6,205	50.0%
Total assets	45,331	51,604	51,677	51,556	4.4%
Short and long-term debt	34,364	35,713	35,713	35,713	1.3%
Other long-term liabilities	560	471	471	471	-5.6%
Total liabilities	48,236	52,184	52,107	52,029	2.6%
Net debt/(funds)	30,509	29,783	28,268	27,121	-3.8%
Shareholders' equity	-3,131	-792	-583	-555	N/A

Valuation and leverage metrics	Average				
P/E (adj) (x)	N/A	N/A	N/A	18.2	18.2
Prop. EV/EBITDA	8.0	6.9	6.4	6.1	6.9
Prop. EV/OpFCF	19.8	16.2	14.5	12.9	15.8
Prop. EFCF yield (%)	-3.7	-2.3	4.0	9.6	1.9
P/BV (x)	-2.4	-9.8	-13.3	-14.0	-9.9
Dividend yield (%)	0.0	0.0	0.0	0.0	0.0
Total debt/capital (%)	109.2	101.7	101.2	101.3	103.4
Net debt/EBITDA (x)	6.0	5.4	5.0	4.6	5.2

Selected operating metrics (k)	Average				
Total mobile subscribers - Portugal	6,516	6,481	6,511	6,521	6,507
Total mobile subscribers - France	20,624	21,369	21,789	22,039	21,455

Source: Company data, Bloomberg, Barclays Research
 Note: FY End Dec

European Telecom Services						Industry View: NEUTRAL
NOS (NOS.LS)						Stock Rating: UNDERWEIGHT
Income statement (€mn)	2018A	2019E	2020E	2021E	CAGR	Price (23-Jan-2020) EUR 4.89
Revenue	1,576	1,596	1,618	1,626	1.0%	Price Target EUR 5.00
EBITDA	592	650	661	667	4.1%	Why Underweight? We expect NOS to deliver limited growth in revenues and EBITDA in the coming years as competitive intensity increases. We believe this is not reflected in the stock price, which in our view prices a more favourable outlook
EBIT	202	233	249	271	10.3%	
Finance costs - net	-24	-25	-22	-25	N/A	
Pre-tax income	170	196	231	250	13.7%	
Tax rate (%)	17	21	15	14	-6.6%	
Net income	141	155	196	215	15.0%	Upside case EUR 8.60
EPS (adj) (€)	0.28	0.30	0.38	0.42	15.0%	Failure of Nowo to deliver on its growth strategy
Diluted shares (mn)	513.1	513.1	513.1	513.1	0.0%	
DPS (€)	0.35	0.36	0.37	0.38	2.8%	
Margin and return data					Average	Downside case EUR 4.10
EBITDA margin (%)	37.5	40.8	40.9	41.0	40.0	Strong success of Nowo leading to high pricing pressure in the market
EBIT margin (%)	12.8	14.6	15.4	16.6	14.9	
Pre-tax margin (%)	10.8	12.3	14.3	15.4	13.2	
Net margin (%)	9.0	9.7	12.1	13.2	11.0	
Operating CF margin (%)	13.7	16.6	18.0	19.4	16.9	
ROCE (%)	7.4	8.6	9.1	9.6	8.7	
RONTA (%)	16.0	17.4	16.2	18.5	17.0	
ROA (%)	5.5	6.3	6.8	7.2	6.4	
ROE (%)	12.8	14.4	19.2	20.8	16.8	
Cash flow and balance sheet (€mn)					CAGR	
Cash flow from operations	196	250	276	301	15.3%	
Capex and acquisitions	-376	-386	-370	-351	N/A	
Free cash flow	23	-19	-107	39	19.0%	
NOPAT	167	184	212	233	11.7%	
Tangible fixed assets	1,054	1,302	1,261	1,215	4.9%	
Intangible fixed assets	1,228	1,130	1,375	1,441	5.5%	
Cash and equivalents	2	51	-56	-16	N/A	
Total assets	2,925	3,126	3,238	3,313	4.2%	
Short and long-term debt	1,133	1,379	1,479	1,529	10.5%	
Other long-term liabilities	151	154	154	154	0.8%	
Total liabilities	1,842	2,098	2,198	2,248	6.9%	
Net debt/(funds)	1,131	1,328	1,535	1,545	11.0%	
Shareholders' equity	1,077	1,021	1,033	1,058	-0.6%	
Valuation and leverage metrics					Average	
P/E (adj) (x)	17.7	16.2	12.8	11.7	14.6	
Prop. EV/EBITDA	6.7	7.0	6.7	6.4	6.7	
Prop. EV/OpFCF	18.3	17.3	15.2	13.5	16.1	
Prop. EFCF yield (%)	4.6	4.5	5.8	7.0	5.5	
P/BV (x)	2.3	2.5	2.4	2.4	2.4	
Dividend yield (%)	7.2	7.4	7.6	7.8	7.5	
Total debt/capital (%)	51.1	57.3	58.7	58.9	56.5	
Net debt/EBITDA (x)	1.9	2.0	2.3	2.3	2.1	
Selected operating metrics (k)					Average	
Total mobile subscribers - Portugal	4,768	4,836	4,851	4,843	4,824	
Broadband subs - Portugal	1,383.4	1,417.6	1,442.6	1,447.6	1,422.8	

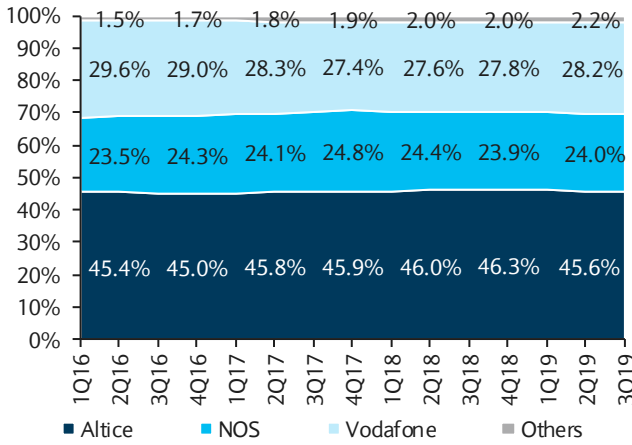


Source: Company data, Bloomberg, Barclays Research
Note: FY End Dec

Portugal in pictures

FIGURE 28

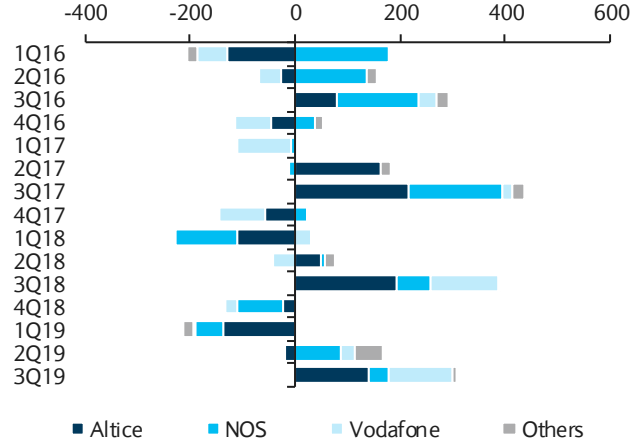
Portugal – Mobile subscriber market share (%)



Source: Anacom, Company reports, Barclays Research

FIGURE 29

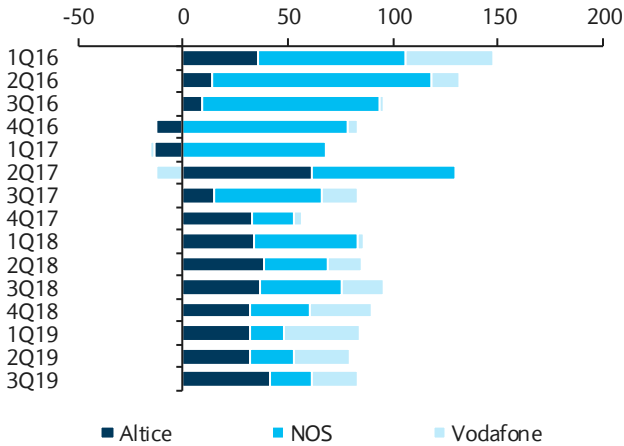
Portugal – Mobile subscriber net adds (000s)



Source: Anacom, Company reports, Barclays Research

FIGURE 30

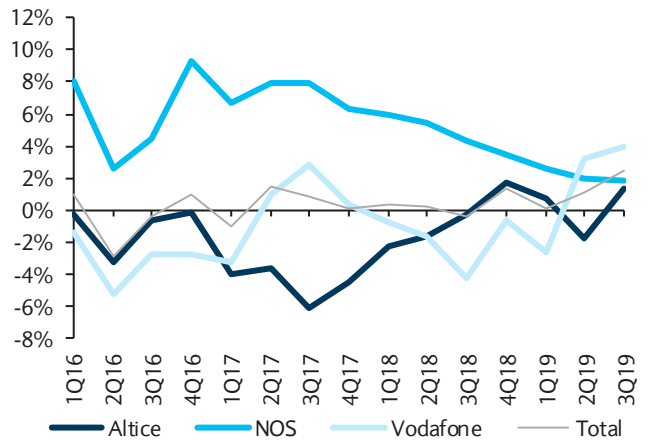
Portugal – Mobile contract subscriber net adds (000s)



Source: Company reports

FIGURE 31

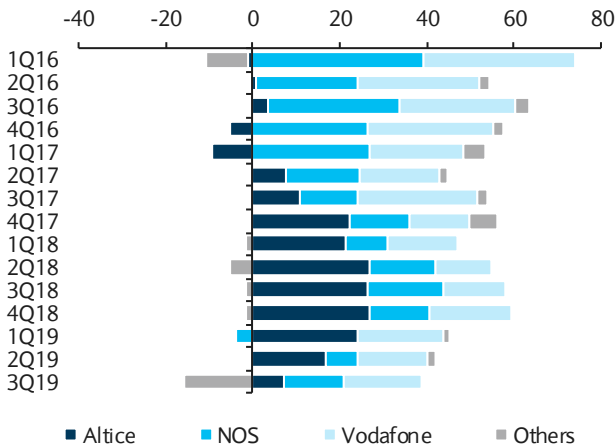
Portugal – Mobile service revenue growth (%)



Source: Company reports, Barclays Research estimates

FIGURE 32

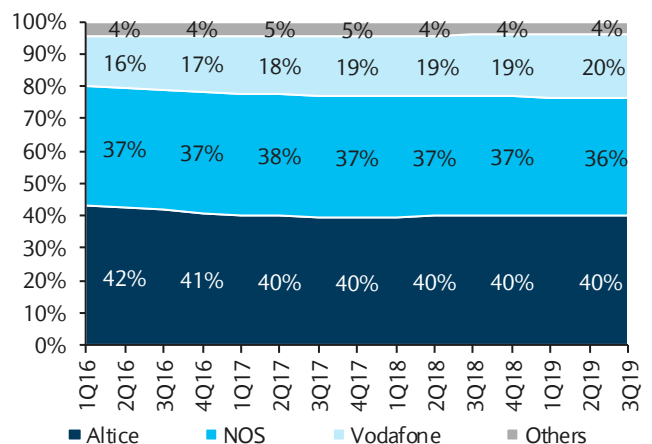
Portugal – Broadband subscriber net adds (000s)



Source: Anacom, Company reports, Barclays Research estimates

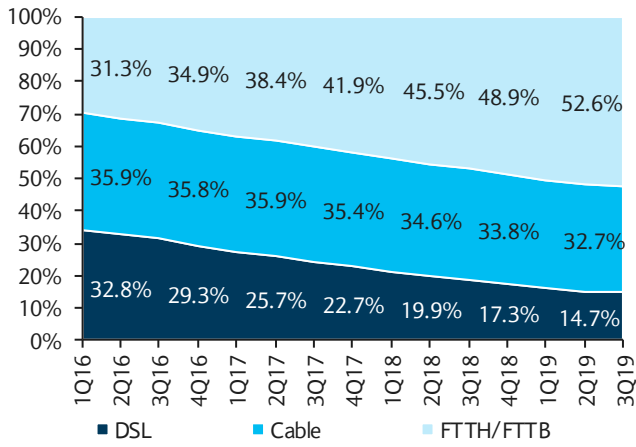
FIGURE 33

Portugal – Broadband market share by operator (%)



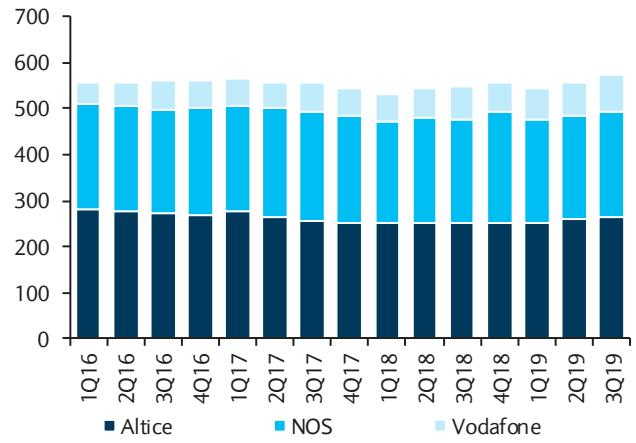
Source: Anacom, Company reports, Barclays Research estimates

FIGURE 34
Portugal – Broadband market share by technology (%)



Source: Anacom, Barclays Research estimates

FIGURE 35
Portugal – Fixed line revenues (EURm)



Source: Company reports, Barclays Research

ANALYST(S) CERTIFICATION(S):

We, Mathieu Robilliard and Maurice Patrick, hereby certify (1) that the views expressed in this research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this research report and (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report.

IMPORTANT DISCLOSURES

Barclays Research is produced by the Investment Bank of Barclays Bank PLC and its affiliates (collectively and each individually, "Barclays"). All authors contributing to this research report are Research Analysts unless otherwise indicated. The publication date at the top of the report reflects the local time where the report was produced and may differ from the release date provided in GMT.

Availability of Disclosures:

Where any companies are the subject of this research report, for current important disclosures regarding those companies please refer to <https://publicresearch.barclays.com> or alternatively send a written request to: Barclays Research Compliance, 745 Seventh Avenue, 13th Floor, New York, NY 10019 or call +1-212-526-1072.

The analysts responsible for preparing this research report have received compensation based upon various factors including the firm's total revenues, a portion of which is generated by investment banking activities, the profitability and revenues of the Markets business and the potential interest of the firm's investing clients in research with respect to the asset class covered by the analyst.

Research analysts employed outside the US by affiliates of Barclays Capital Inc. are not registered/qualified as research analysts with FINRA. Such non-US research analysts may not be associated persons of Barclays Capital Inc., which is a FINRA member, and therefore may not be subject to FINRA Rule 2241 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst's account.

Analysts regularly conduct site visits to view the material operations of covered companies, but Barclays policy prohibits them from accepting payment or reimbursement by any covered company of their travel expenses for such visits.

Barclays Research Department produces various types of research including, but not limited to, fundamental analysis, equity-linked analysis, quantitative analysis, and trade ideas. Recommendations contained in one type of Barclays Research may differ from those contained in other types of Barclays Research, whether as a result of differing time horizons, methodologies, or otherwise.

In order to access Barclays Statement regarding Research Dissemination Policies and Procedures, please refer to <https://publicresearch.barcap.com/S/RD.htm>. In order to access Barclays Research Conflict Management Policy Statement, please refer to: <https://publicresearch.barcap.com/S/CM.htm>.

Primary Stocks (Ticker, Date, Price)

Altice NV (ATCA.AS, 23-Jan-2020, EUR 6.18), Underweight/Neutral, D/J/K/L/M

NOS (NOS.LS, 23-Jan-2020, EUR 4.89), Underweight/Neutral, CD/J/K/N

Unless otherwise indicated, prices are sourced from Bloomberg and reflect the closing price in the relevant trading market, which may not be the last available price at the time of publication.

Disclosure Legend:

A: Barclays Bank PLC and/or an affiliate has been lead manager or co-lead manager of a publicly disclosed offer of securities of the issuer in the previous 12 months.

B: An employee or non-executive director of Barclays PLC is a director of this issuer.

CD: Barclays Bank PLC and/or an affiliate is a market-maker in debt securities issued by this issuer.

CE: Barclays Bank PLC and/or an affiliate is a market-maker in equity securities issued by this issuer.

D: Barclays Bank PLC and/or an affiliate has received compensation for investment banking services from this issuer in the past 12 months.

E: Barclays Bank PLC and/or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer within the next 3 months.

FA: Barclays Bank PLC and/or an affiliate beneficially owns 1% or more of a class of equity securities of this issuer, as calculated in accordance with US regulations.

FB: Barclays Bank PLC and/or an affiliate beneficially owns a long position of more than 0.5% of a class of equity securities of this issuer, as calculated in accordance with EU regulations.

FC: Barclays Bank PLC and/or an affiliate beneficially owns a short position of more than 0.5% of a class of equity securities of this issuer, as calculated in accordance with EU regulations.

FD: Barclays Bank PLC and/or an affiliate beneficially owns 1% or more of a class of equity securities of this issuer, as calculated in accordance with South Korean regulations.

GD: One of the analysts on the fundamental credit coverage team (or a member of his or her household) has a financial interest in the debt or equity securities of this issuer.

GE: One of the analysts on the fundamental equity coverage team (or a member of his or her household) has a financial interest in the debt or equity securities of this issuer.

H: This issuer beneficially owns more than 5% of any class of common equity securities of Barclays PLC.

IMPORTANT DISCLOSURES CONTINUED

I: Barclays Bank PLC and/or an affiliate is party to an agreement with this issuer for the provision of financial services to Barclays Bank PLC and/or an affiliate.

J: Barclays Bank PLC and/or an affiliate is a liquidity provider and/or trades regularly in the securities of this issuer and/or in any related derivatives.

K: Barclays Bank PLC and/or an affiliate has received non-investment banking related compensation (including compensation for brokerage services, if applicable) from this issuer within the past 12 months.

L: This issuer is, or during the past 12 months has been, an investment banking client of Barclays Bank PLC and/or an affiliate.

M: This issuer is, or during the past 12 months has been, a non-investment banking client (securities related services) of Barclays Bank PLC and/or an affiliate.

N: This issuer is, or during the past 12 months has been, a non-investment banking client (non-securities related services) of Barclays Bank PLC and/or an affiliate.

O: Not in use.

P: A partner, director or officer of Barclays Capital Canada Inc. has, during the preceding 12 months, provided services to the subject company for remuneration, other than normal course investment advisory or trade execution services.

Q: Barclays Bank PLC and/or an affiliate is a Corporate Broker to this issuer.

R: Barclays Capital Canada Inc. and/or an affiliate has received compensation for investment banking services from this issuer in the past 12 months.

S: This issuer is a Corporate Broker to Barclays PLC.

T: Barclays Bank PLC and/or an affiliate is providing equity advisory services to this issuer.

U: The equity securities of this Canadian issuer include subordinate voting restricted shares.

V: The equity securities of this Canadian issuer include non-voting restricted shares.

Risk Disclosure(s)

Master limited partnerships (MLPs) are pass-through entities structured as publicly listed partnerships. For tax purposes, distributions to MLP unit holders may be treated as a return of principal. Investors should consult their own tax advisors before investing in MLP units.

Guide to the Barclays Fundamental Equity Research Rating System:

Our coverage analysts use a relative rating system in which they rate stocks as Overweight, Equal Weight or Underweight (see definitions below) relative to other companies covered by the analyst or a team of analysts that are deemed to be in the same industry (the "industry coverage universe").

In addition to the stock rating, we provide industry views which rate the outlook for the industry coverage universe as Positive, Neutral or Negative (see definitions below). A rating system using terms such as buy, hold and sell is not the equivalent of our rating system. Investors should carefully read the entire research report including the definitions of all ratings and not infer its contents from ratings alone.

Stock Rating

Overweight - The stock is expected to outperform the unweighted expected total return of the industry coverage universe over a 12-month investment horizon.

Equal Weight - The stock is expected to perform in line with the unweighted expected total return of the industry coverage universe over a 12-month investment horizon.

Underweight - The stock is expected to underperform the unweighted expected total return of the industry coverage universe over a 12-month investment horizon.

Rating Suspended - The rating and target price have been suspended temporarily due to market events that made coverage impracticable or to comply with applicable regulations and/or firm policies in certain circumstances including where the Investment Bank of Barclays Bank PLC is acting in an advisory capacity in a merger or strategic transaction involving the company.

Industry View

Positive - industry coverage universe fundamentals/valuations are improving.

Neutral - industry coverage universe fundamentals/valuations are steady, neither improving nor deteriorating.

Negative - industry coverage universe fundamentals/valuations are deteriorating.

Below is the list of companies that constitute the "industry coverage universe":

European Telecom Services

Airtel Africa (AAF.L)

Altice NV (ATCA.AS)

Bezeq (BEZQ.TA)

Big Blu Broadband (BBB.L)

Bouygues SA (BOUY.PA)

BT Group PLC (BT.L)

Cellcom Israel Ltd. (CEL.TA)

Cellnex Telecom (CLNX.MC)

Deutsche Telekom AG (DTEGn.DE)

DNA Oyj (DNAO.HE)

Drillisch (DRIG.DE)

Elisa Oyj (ELISA.HE)

Euskaltel SA (EKTL.MC)

Freenet (FNTGn.DE)

Gamma Communications PLC (GAMA.L)

IMPORTANT DISCLOSURES CONTINUED

Helios Towers (HTWS.L)	Iliad SA (ILD.PA)	INWIT (INWT.MI)
Iridium Communications Inc (IRDM)	KPN (KPN.AS)	Liberty Global (LBTYA)
Masmovil (MASM.MC)	NOS (NOS.LS)	Orange (ORAN.PA)
Orange Belgium (OBEL.BR)	OTE (OTEr.AT)	Partner Communications Company Ltd. (PTNR.TA)
Proximus (PROX.BR)	Sunrise (SRCC.S)	Swisscom (SCMN.S)
TalkTalk Telecom Group (TALK.L)	Tele Columbus AG (TC1n.DE)	Tele2 AB (TEL2b.ST)
Telecom Italia SpA (TLIT.MI)	Telecom Italia-RSP (TLITn.MI)	Telefonica Deutschland (O2Dn.DE)
Telefonica SA (TEF.MC)	Telekom Austria (TELA.VI)	Telenet Group Holding NV (TNET.BR)
Telenor ASA (TEL.OL)	Telia Company AB (TELIA.ST)	United Internet (UTDI.DE)
ViaSat (VSAT)	Vodafone Group Plc (VOD.L)	Zegona Communications plc (ZEG.L)

Distribution of Ratings:

Barclays Equity Research has 1580 companies under coverage.

45% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 50% of companies with this rating are investment banking clients of the Firm; 76% of the issuers with this rating have received financial services from the Firm.

38% have been assigned an Equal Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 43% of companies with this rating are investment banking clients of the Firm; 68% of the issuers with this rating have received financial services from the Firm.

15% have been assigned an Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Sell rating; 32% of companies with this rating are investment banking clients of the Firm; 64% of the issuers with this rating have received financial services from the Firm.

Guide to the Barclays Research Price Target:

Each analyst has a single price target on the stocks that they cover. The price target represents that analyst's expectation of where the stock will trade in the next 12 months. Upside/downside scenarios, where provided, represent potential upside/potential downside to each analyst's price target over the same 12-month period.

Top Picks:

Barclays Equity Research's "Top Picks" represent the single best alpha-generating investment idea within each industry (as defined by the relevant "industry coverage universe"), taken from among the Overweight-rated stocks within that industry. Barclays Equity Research publishes "Top Picks" reports every quarter and analysts may also publish intra-quarter changes to their Top Picks, as necessary. While analysts may highlight other Overweight-rated stocks in their published research in addition to their Top Pick, there can only be one "Top Pick" for each industry. To view the current list of Top Picks, go to the Top Picks page on Barclays Live (<https://live.barcap.com/go/keyword/TopPicks>).

To see a list of companies that comprise a particular industry coverage universe, please go to <https://publicresearch.barclays.com>.

Types of investment recommendations produced by Barclays Equity Research:

In addition to any ratings assigned under Barclays' formal rating systems, this publication may contain investment recommendations in the form of trade ideas, thematic screens, scorecards or portfolio recommendations that have been produced by analysts within Equity Research. Any such investment recommendations shall remain open until they are subsequently amended, rebalanced or closed in a future research report.

Disclosure of other investment recommendations produced by Barclays Equity Research:

Barclays Equity Research may have published other investment recommendations in respect of the same securities/instruments recommended in this research report during the preceding 12 months. To view all investment recommendations published by Barclays Equity Research in the preceding 12 months please refer to <https://live.barcap.com/go/research/Recommendations>.

Legal entities involved in producing Barclays Research:

Barclays Bank PLC (Barclays, UK)

Barclays Capital Inc. (BCI, US)

Barclays Bank Ireland PLC, Frankfurt Branch (BBI, Frankfurt)

Barclays Bank Ireland PLC, Paris Branch (BBI, Paris)

Barclays Bank Ireland PLC, Milan Branch (BBI, Milan)

Barclays Securities Japan Limited (BSJL, Japan)

Barclays Bank PLC, Hong Kong branch (Barclays Bank, Hong Kong)

Barclays Capital Canada Inc. (BCCI, Canada)

Barclays Bank Mexico, S.A. (BBMX, Mexico)

IMPORTANT DISCLOSURES CONTINUED

Barclays Securities (India) Private Limited (BSIPL, India)

Barclays Bank PLC, India branch (Barclays Bank, India)

Barclays Bank PLC, Singapore branch (Barclays Bank, Singapore)

Barclays Bank PLC, DIFC Branch (Barclays Bank, DIFC)

IMPORTANT DISCLOSURES CONTINUED

Altice NV (ATC NA / ATCA.AS)

EUR 6.18 (23-Jan-2020)

Stock Rating

UNDERWEIGHT

Industry View

NEUTRAL

Rating and Price Target Chart - EUR (as of 23-Jan-2020)

Currency=EUR



Publication Date	Closing Price	Rating	Adjusted Price Target
14-Jan-2020	6.00		4.15
09-Dec-2019	5.13		3.40
25-Nov-2019	5.20		3.70
11-Oct-2019	5.15		3.40
30-Sep-2019	4.80		3.20
13-Aug-2019	4.19		3.10
03-Jul-2019	3.10		2.40
01-Apr-2019	2.33		1.90
05-Mar-2019	1.87	Underweight	1.50
26-Nov-2018	1.64		2.80
03-Aug-2018	2.37		2.90
31-May-2018	3.03	Equal Weight	3.40
16-Apr-2018	1.69		2.23
23-Mar-2018	1.51		2.32
19-Mar-2018	1.65		2.34
23-Jan-2018	2.01	Overweight	2.36
19-Jan-2018	1.89		2.07
28-Nov-2017	1.50		1.90
16-Oct-2017	3.62		4.43
20-Jul-2017	4.46	Equal Weight	4.74
27-Apr-2017	4.79	Rating Suspended	

On 23-Jan-2017, prior to any intra-day change that may have been published, the rating for this security was Equal Weight, and the adjusted price target was 3.58.

Source: Bloomberg, Barclays Research

Historical stock prices and price targets may have been adjusted for stock splits and dividends.

Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

D: Barclays Bank PLC and/or an affiliate has received compensation for investment banking services from Altice NV in the past 12 months.

J: Barclays Bank PLC and/or an affiliate is a liquidity provider and/or trades regularly in the securities by Altice NV and/or in any related derivatives.

K: Barclays Bank PLC and/or an affiliate has received non-investment banking related compensation (including compensation for brokerage services, if applicable) from Altice NV within the past 12 months.

L: Altice NV is, or during the past 12 months has been, an investment banking client of Barclays Bank PLC and/or an affiliate.

M: Altice NV is, or during the past 12 months has been, a non-investment banking client (securities related services) of Barclays Bank PLC and/or an affiliate.

Valuation Methodology: We use a DCF-based SoP methodology to arrive at our Altice valuation. We use WACCs ranging between 8% and 10% and a terminal growth rate of 1.0%.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Altice is highly geared, and the European equity stub is small vs. net debt, suggesting a high degree of equity volatility is likely either to the upside or downside. Altice has significant mid-term debt maturities and limited near term free cashflow; the company will require an operational turnaround to meet its liabilities. M&A in different markets could drive significant value creation to Altice presenting a key upside risk.

IMPORTANT DISCLOSURES CONTINUED

NOS (NOS PL / NOS.LS)

EUR 4.89 (23-Jan-2020)

Stock Rating

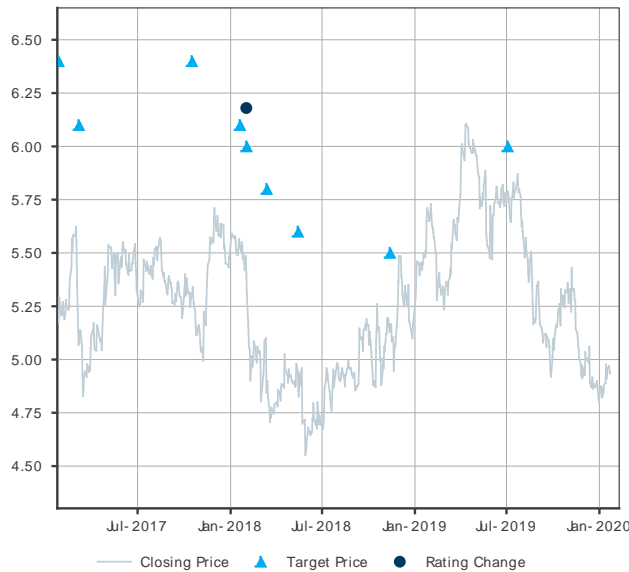
UNDERWEIGHT

Industry View

NEUTRAL

Rating and Price Target Chart - EUR (as of 23-Jan-2020)

Currency=EUR



Publication Date	Closing Price	Rating	Adjusted Price Target
03-Jul-2019	5.79		6.00
12-Nov-2018	5.13		5.50
14-May-2018	4.95		5.60
13-Mar-2018	4.85		5.80
01-Feb-2018	5.41	Underweight	6.00
19-Jan-2018	5.54		6.10
16-Oct-2017	5.31		6.40
06-Mar-2017	5.07		6.10
25-Jan-2017	5.17		6.40

On 23-Jan-2017, prior to any intra-day change that may have been published, the rating for this security was Equal Weight, and the adjusted price target was 7.00.

Source: Bloomberg, Barclays Research

Historical stock prices and price targets may have been adjusted for stock splits and dividends.

Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

CD: Barclays Bank PLC and/or an affiliate is a market-maker in debt securities issued by NOS.

J: Barclays Bank PLC and/or an affiliate is a liquidity provider and/or trades regularly in the securities by NOS and/or in any related derivatives.

K: Barclays Bank PLC and/or an affiliate has received non-investment banking related compensation (including compensation for brokerage services, if applicable) from NOS within the past 12 months.

N: NOS is, or during the past 12 months has been, a non-investment banking client (non-securities related services) of Barclays Bank PLC and/or an affiliate.

Valuation Methodology: We use a DCF and SoP based valuation for NOS, assuming an 7.5% WACC and 1% terminal growth rate for the domestic business.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Key upside risks: The regulator returns to a more pro-investment stance. Nowo's new strategy is unsuccessful.

DISCLAIMER:

This publication has been produced by Barclays Research Department in the Investment Bank of Barclays Bank PLC and/or one or more of its affiliates (collectively and each individually, "Barclays"). It has been prepared for institutional investors and not for retail investors. It has been distributed by one or more Barclays affiliated legal entities listed below. It is provided to our clients for information purposes only, and Barclays makes no express or implied warranties, and expressly disclaims all warranties of merchantability or fitness for a particular purpose or use with respect to any data included in this publication. To the extent that this publication states on the front page that it is intended for institutional investors and is not subject to all of the independence and disclosure standards applicable to debt research reports prepared for retail investors under U.S. FINRA Rule 2242, it is an "institutional debt research report" and distribution to retail investors is strictly prohibited. Barclays also distributes such institutional debt research reports to various issuers, media, regulatory and academic organisations for their own internal informational news gathering, regulatory or academic purposes and not for the purpose of making investment decisions regarding any debt securities. Media organisations are prohibited from re-publishing any opinion or recommendation concerning a debt issuer or debt security contained in any Barclays institutional debt research report. Any such recipients that do not want to continue receiving Barclays institutional debt research reports should contact debtresearch@barclays.com. Clients that are subscribed to receive equity research reports, will not receive certain cross asset research reports co-authored by equity and FICC research analysts that are distributed as "institutional debt research reports" unless they have agreed to accept such reports. Eligible clients may get access to such cross asset reports by contacting debtresearch@barclays.com. Barclays will not treat unauthorized recipients of this report as its clients and accepts no liability for use by them of the contents which may not be suitable for their personal use. Prices shown are indicative and Barclays is not offering to buy or sell or soliciting offers to buy or sell any financial instrument.

Without limiting any of the foregoing and to the extent permitted by law, in no event shall Barclays, nor any affiliate, nor any of their respective officers, directors, partners, or employees have any liability for (a) any special, punitive, indirect, or consequential damages; or (b) any lost profits, lost revenue, loss of anticipated savings or loss of opportunity or other financial loss, even if notified of the possibility of such damages, arising from any use of this publication or its contents.

Other than disclosures relating to Barclays, the information contained in this publication has been obtained from sources that Barclays Research believes to be reliable, but Barclays does not represent or warrant that it is accurate or complete. Barclays is not responsible for, and makes no warranties whatsoever as to, the information or opinions contained in any written, electronic, audio or video presentations of third parties that are accessible via a direct hyperlink in this publication or via a hyperlink to a third-party web site ("Third-Party Content"). Any such Third-Party Content has not been adopted or endorsed by Barclays, does not represent the views or opinions of Barclays, and is not incorporated by reference into this publication. Third-Party Content is provided for information purposes only and Barclays has not independently verified its accuracy or completeness.

The views in this publication are solely and exclusively those of the authoring analyst(s) and are subject to change, and Barclays Research has no obligation to update its opinions or the information in this publication. Unless otherwise disclosed herein, the analysts who authored this report have not received any compensation from the subject companies in the past 12 months. If this publication contains recommendations, they are general recommendations that were prepared independently of any other interests, including those of Barclays and/or its affiliates, and/or the subject companies. This publication does not contain personal investment recommendations or investment advice or take into account the individual financial circumstances or investment objectives of the clients who receive it. The securities and other investments discussed herein may not be suitable for all investors. Barclays is not a fiduciary to any recipient of this publication. Investors must independently evaluate the merits and risks of the investments discussed herein, consult any independent advisors they believe necessary, and exercise independent judgment with regard to any investment decision. The value of and income from any investment may fluctuate from day to day as a result of changes in relevant economic markets (including changes in market liquidity). The information herein is not intended to predict actual results, which may differ substantially from those reflected. Past performance is not necessarily indicative of future results. The information provided does not constitute a financial benchmark and should not be used as a submission or contribution of input data for the purposes of determining a financial benchmark.

United Kingdom: This document is being distributed (1) only by or with the approval of an authorised person (Barclays Bank PLC) or (2) to, and is directed at (a) persons in the United Kingdom having professional experience in matters relating to investments and who fall within the definition of "investment professionals" in Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the "Order"); or (b) high net worth companies, unincorporated associations and partnerships and trustees of high value trusts as described in Article 49(2) of the Order; or (c) other persons to whom it may otherwise lawfully be communicated (all such persons being "Relevant Persons"). Any investment or investment activity to which this communication relates is only available to and will only be engaged in with Relevant Persons. Any other persons who receive this communication should not rely on or act upon it. Barclays Bank PLC is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority and is a member of the London Stock Exchange.

European Economic Area ("EEA"): This material is being distributed in the EEA by Barclays Bank PLC. Barclays Bank PLC is not registered in France with the *Autorité des marchés financiers* or the *Autorité de contrôle prudentiel*.

Americas: The Investment Bank of Barclays Bank PLC undertakes U.S. securities business in the name of its wholly owned subsidiary Barclays Capital Inc., a FINRA and SIPC member. Barclays Capital Inc., a U.S. registered broker/dealer, is distributing this material in the United States and, in connection therewith accepts responsibility for its contents. Any U.S. person wishing to effect a transaction in any security discussed herein should do so only by contacting a representative of Barclays Capital Inc. in the U.S. at 745 Seventh Avenue, New York, New York 10019.

Non-U.S. persons should contact and execute transactions through a Barclays Bank PLC branch or affiliate in their home jurisdiction unless local regulations permit otherwise.

This material is distributed in Canada by Barclays Capital Canada Inc., a registered investment dealer, a Dealer Member of IROC (www.iroc.ca), and a Member of the Canadian Investor Protection Fund (CIPF).

This material is distributed in Mexico by Barclays Bank Mexico, S.A. This material is distributed in the Cayman Islands and in the Bahamas by Barclays Capital Inc., which it is not licensed or registered to conduct and does not conduct business in, from or within those jurisdictions and has

not filed this material with any regulatory body in those jurisdictions.

Japan: This material is being distributed to institutional investors in Japan by Barclays Securities Japan Limited. Barclays Securities Japan Limited is a joint-stock company incorporated in Japan with registered office of 6-10-1 Roppongi, Minato-ku, Tokyo 106-6131, Japan. It is a subsidiary of Barclays Bank PLC and a registered financial instruments firm regulated by the Financial Services Agency of Japan. Registered Number: Kanto Zaimukyokucho (kinsho) No. 143.

Asia Pacific (excluding Japan): Barclays Bank PLC, Hong Kong Branch is distributing this material in Hong Kong as an authorised institution regulated by the Hong Kong Monetary Authority. Registered Office: 41/F, Cheung Kong Center, 2 Queen's Road Central, Hong Kong.

All Indian securities-related research and other equity research produced by Barclays' Investment Bank are distributed in India by Barclays Securities (India) Private Limited (BSIPL). BSIPL is a company incorporated under the Companies Act, 1956 having CIN U67120MH2006PTC161063. BSIPL is registered and regulated by the Securities and Exchange Board of India (SEBI) as a Research Analyst: INH000001519; Portfolio Manager INP000002585; Stock Broker/Trading and Clearing Member: National Stock Exchange of India Limited (NSE) Capital Market INB231292732, NSE Futures & Options INF231292732, NSE Currency derivatives INE231450334, Bombay Stock Exchange Limited (BSE) Capital Market INB011292738, BSE Futures & Options INF011292738; Depository Participant (DP) with the National Securities & Depositories Limited (NSDL): DP ID: IN-DP-NSDL-299-2008; Investment Adviser: INA000000391. The registered office of BSIPL is at 208, Ceejay House, Shivsagar Estate, Dr. A. Besant Road, Worli, Mumbai – 400 018, India. Telephone No: +91 2267196000. Fax number: +91 22 67196100. Any other reports produced by Barclays' Investment Bank are distributed in India by Barclays Bank PLC, India Branch, an associate of BSIPL in India that is registered with Reserve Bank of India (RBI) as a Banking Company under the provisions of The Banking Regulation Act, 1949 (Regn No BOM43) and registered with SEBI as Merchant Banker (Regn No INM000002129) and also as Banker to the Issue (Regn No INBI00000950). Barclays Investments and Loans (India) Limited, registered with RBI as Non Banking Financial Company (Regn No RBI CoR-07-00258), and Barclays Wealth Trustees (India) Private Limited, registered with Registrar of Companies (CIN U93000MH2008PTC188438), are associates of BSIPL in India that are not authorised to distribute any reports produced by Barclays' Investment Bank.

This material is distributed in Singapore by the Singapore branch of Barclays Bank PLC, a bank licensed in Singapore by the Monetary Authority of Singapore. For matters in connection with this material, recipients in Singapore may contact the Singapore branch of Barclays Bank PLC, whose registered address is 10 Marina Boulevard, #23-01 Marina Bay Financial Centre Tower 2, Singapore 018983.

This material is distributed to persons in Australia by Barclays Bank PLC. None of Barclays Bank PLC, nor any other Barclays group entity, holds an Australian financial services licence and instead relies on an exemption from the requirement to hold such a licence. This material is intended to only be distributed to "wholesale clients" as defined by the Australian Corporations Act 2001. This material is distributed in New Zealand by Barclays Bank PLC, but it has not been registered, filed or approved by any New Zealand regulatory authority or under or in accordance with the Financial Markets Conduct Act of 2013, and this material is not a disclosure document under New Zealand law.

Middle East: Nothing herein should be considered investment advice as defined in the Israeli Regulation of Investment Advisory, Investment Marketing and Portfolio Management Law, 1995 ("Advisory Law"). This document is being made to eligible clients (as defined under the Advisory Law) only. Barclays Israeli branch previously held an investment marketing license with the Israel Securities Authority but it cancelled such license on 30/11/2014 as it solely provides its services to eligible clients pursuant to available exemptions under the Advisory Law, therefore a license with the Israel Securities Authority is not required. Accordingly, Barclays does not maintain an insurance coverage pursuant to the Advisory Law.

This material is distributed in the United Arab Emirates (including the Dubai International Financial Centre) and Qatar by Barclays Bank PLC. Barclays Bank PLC in the Dubai International Financial Centre (Registered No. 0060) is regulated by the Dubai Financial Services Authority (DFSA). Principal place of business in the Dubai International Financial Centre: The Gate Village, Building 4, Level 4, PO Box 506504, Dubai, United Arab Emirates. Barclays Bank PLC-DIFC Branch, may only undertake the financial services activities that fall within the scope of its existing DFSA licence. Related financial products or services are only available to Professional Clients, as defined by the Dubai Financial Services Authority. Barclays Bank PLC in the UAE is regulated by the Central Bank of the UAE and is licensed to conduct business activities as a branch of a commercial bank incorporated outside the UAE in Dubai (Licence No.: 13/1844/2008, Registered Office: Building No. 6, Burj Dubai Business Hub, Sheikh Zayed Road, Dubai City) and Abu Dhabi (Licence No.: 13/952/2008, Registered Office: Al Jazira Towers, Hamdan Street, PO Box 2734, Abu Dhabi). This material does not constitute or form part of any offer to issue or sell, or any solicitation of any offer to subscribe for or purchase, any securities or investment products in the UAE (including the Dubai International Financial Centre) and accordingly should not be construed as such. Furthermore, this information is being made available on the basis that the recipient acknowledges and understands that the entities and securities to which it may relate have not been approved, licensed by or registered with the UAE Central Bank, the Dubai Financial Services Authority or any other relevant licensing authority or governmental agency in the UAE. The content of this report has not been approved by or filed with the UAE Central Bank or Dubai Financial Services Authority. Barclays Bank PLC in the Qatar Financial Centre (Registered No. 00018) is authorised by the Qatar Financial Centre Regulatory Authority (QFCRA). Barclays Bank PLC-QFC Branch may only undertake the regulated activities that fall within the scope of its existing QFCRA licence. Principal place of business in Qatar: Qatar Financial Centre, Office 1002, 10th Floor, QFC Tower, Diplomatic Area, West Bay, PO Box 15891, Doha, Qatar. Related financial products or services are only available to Business Customers as defined by the Qatar Financial Centre Regulatory Authority.

Russia: This material is not intended for investors who are not Qualified Investors according to the laws of the Russian Federation as it might contain information about or description of the features of financial instruments not admitted for public offering and/or circulation in the Russian Federation and thus not eligible for non-Qualified Investors. If you are not a Qualified Investor according to the laws of the Russian Federation, please dispose of any copy of this material in your possession.

IRS Circular 230 Prepared Materials Disclaimer: Barclays does not provide tax advice and nothing contained herein should be construed to be tax advice. Please be advised that any discussion of U.S. tax matters contained herein (including any attachments) (i) is not intended or written to be used, and cannot be used, by you for the purpose of avoiding U.S. tax-related penalties; and (ii) was written to support the promotion or marketing of the transactions or other matters addressed herein. Accordingly, you should seek advice based on your particular circumstances from an independent tax advisor.

© Copyright Barclays Bank PLC (2020). All rights reserved. No part of this publication may be reproduced or redistributed in any manner without the prior written permission of Barclays. Barclays Bank PLC is registered in England No. 1026167. Registered office 1 Churchill Place, London, E14

5HP. Additional information regarding this publication will be furnished upon request.

