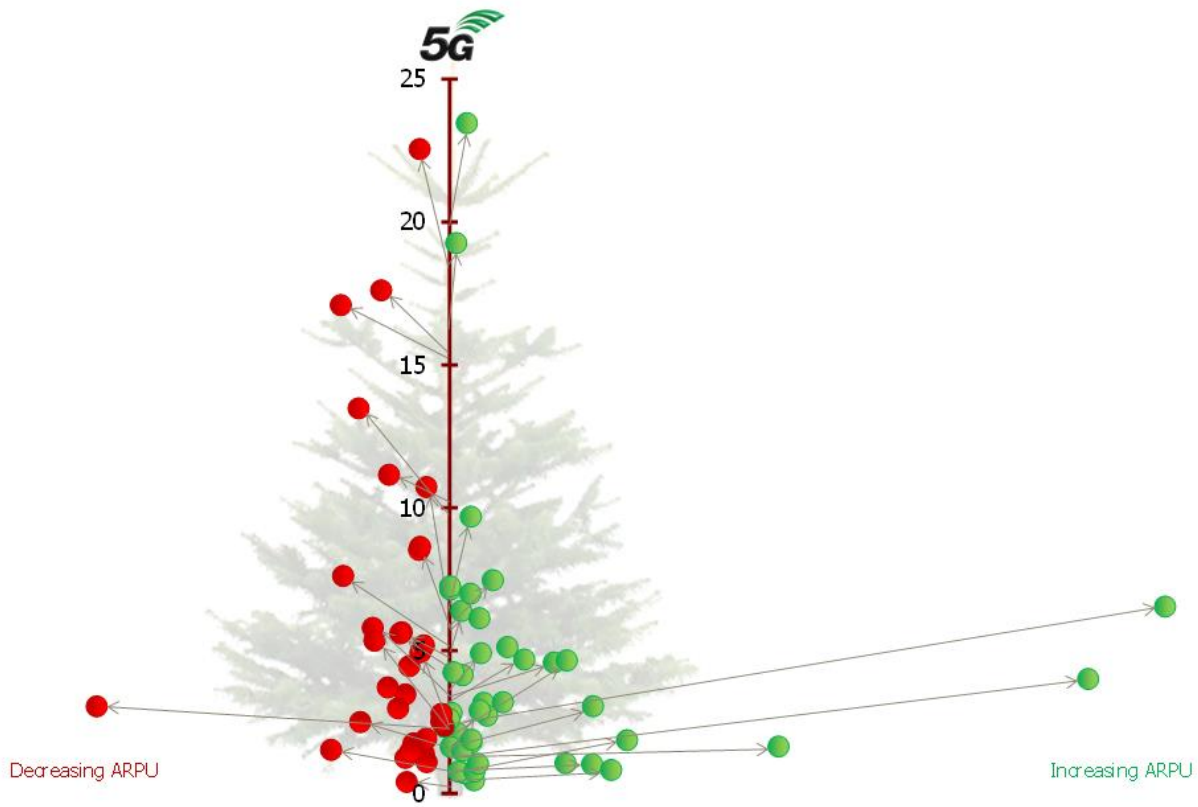
tefficient

Industry analysis #3 2019

Mobile data – first half 2019

Mobile data consumption continues to grow – a majority of operators now rewarded with ARPU

Taiwan: Unlimited is so last year – Korea: 5G boosts usage



Tefficient's 24th public analysis on the development and drivers of mobile data ranks 115 operators based on average data usage per SIM, total data traffic and revenue per gigabyte in the first half of 2019.

The data usage per SIM grew for all; everybody climbed our Christmas tree. More than half of the operators could turn that data usage growth into ARPU growth – for the first time a majority is in green. Read on to see who delivered on "more for more" – and who didn't.

Speaking of which, we take a closer look at the development of one of the unlimited powerhouses – Taiwan. Are people getting tired of mobile data?

We also provide insight into South Korea – the world's leading 5G market. Just how much effect did 5G have on the data usage?

Fifteen operators now above 10 GB per SIM per month

Figure 1 shows the average mobile data usage for 115 reporting or reported[1] mobile operators globally with values for the first half of 2019 or for the full year of 2018.

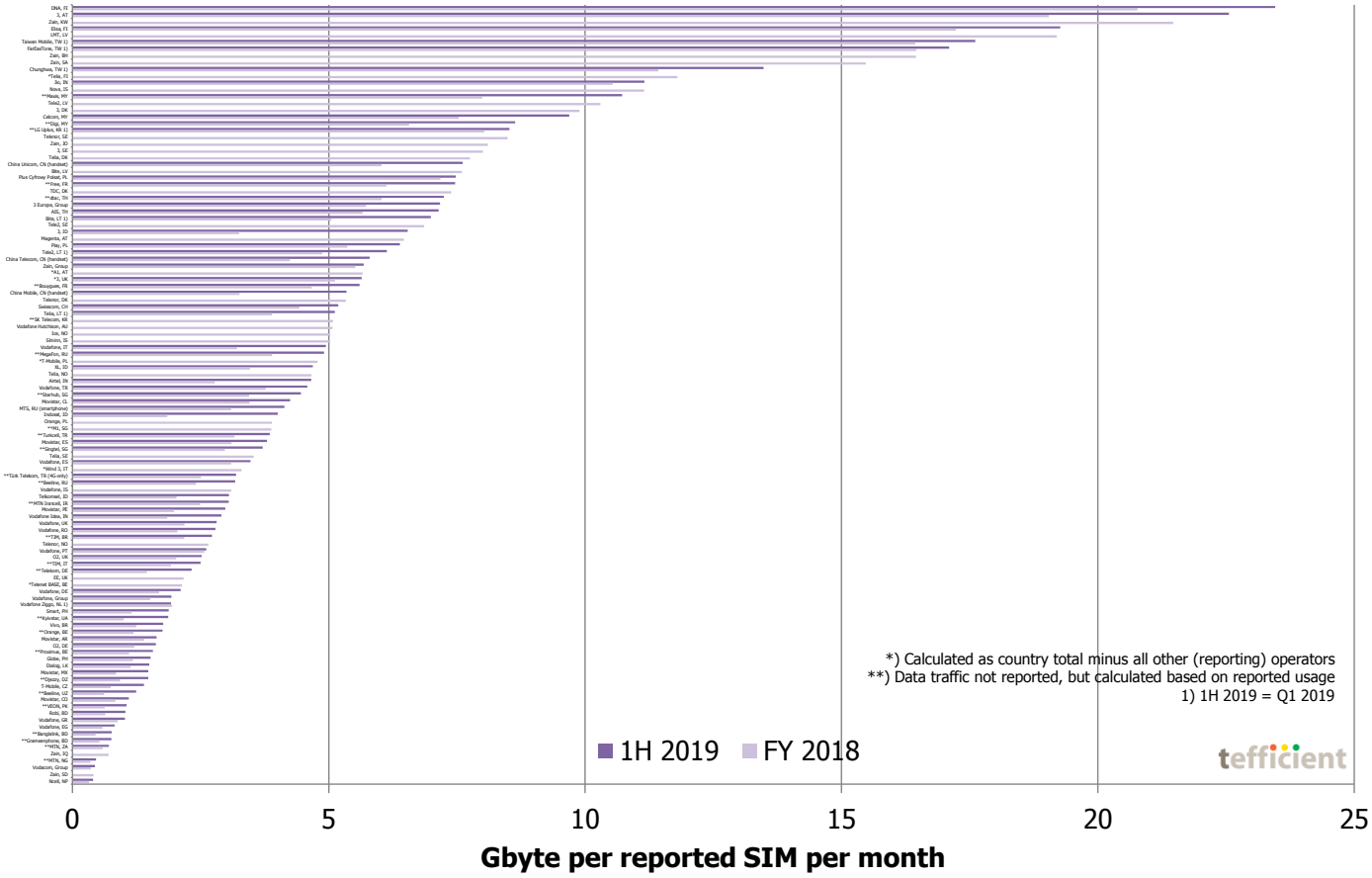


Figure 1. Average data usage per reported SIM per month – all operators

As it's nearly impossible to read Figure 1 we will break it down into three regions of the world, but let's first identify the **global data usage leaders** – see Figure 2.

There is a change in the global top: **DNA** has overtaken Zain Kuwait[2] as the operator with the highest mobile data consumption per SIM. With **23.5 GB** of data per SIM per month, DNA has the highest-ever average usage to date. **Unlimited, speed-tiered, plans** – both for data-only and smartphones – form a key component of the Finnish market logic. DNA doesn't report how large share of its base that has unlimited plans, but for Finland as a whole, that share was **67%** of non-M2M SIMs in

[1] By regulators – if reported latest 5 September 2019

[2] But since Zain Kuwait doesn't report data traffic more frequently than annually, we can't say where Zain is in 1H 2019

December 2018. An interesting micro-trend during the first half of 2019 is that DNA's total traffic decreased in Q2 2019 compared to Q1 2019. Such a quarter-to-quarter decrease has never before happened in DNA's history. We will soon be back with other indications of that unlimited markets start to show signs of saturation when it comes to mobile data usage.

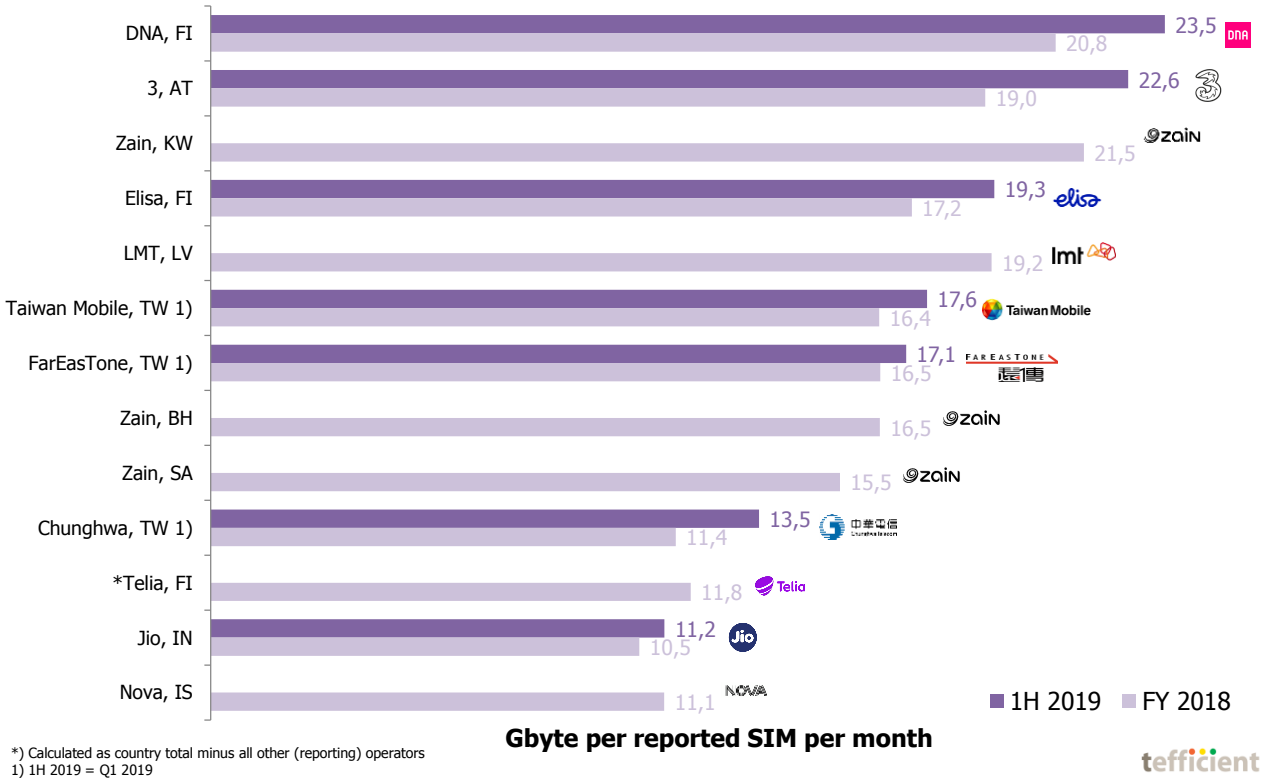


Figure 2. Average data usage per reported SIM per month – top 13 operators

Also **Drei** (3) Austria climbs one position compared to our previous report. The company carried **43%** of Austria's total mobile data traffic in Q1 2019. That share used to be even higher, but that is more a reflection of that Drei's competitors A1 and T-Mobile eventually embraced the data-only home segment that previously pretty much was defined and owned by Drei. The Austrian home internet plans come with **unlimited, speed-tiered, data**. Hybrid routers are now offered by A1 and T-Mobile to speed up the slow fixed internet that is characteristic for Austria. Unlike Finland, unlimited *smartphone* plans are a new thing in Austria – Magenta and A1 (but not Drei) have introduced these in 2019.

Zain Kuwait had 21.5 GB per SIM in 2018 and is pushed down to third place since Zain only reports data traffic for full years.

Below the podium we find **Elisa** from Finland (19.3 GB per SIM per month in 1H 2019). Just like DNA, Elisa carried less traffic in Q2 2019 than in Q1 2019 – again something that hasn't happened earlier.

LMT from Latvia is ranked #5 with 19.2 GB in 2018, followed by **Taiwan Mobile** (17.6 GB[3]), **FarEasTone** Taiwan (17.1 GB[3]), **Zain** from Bahrain (16.5 GB in 2018) and **Zain** Saudi Arabia (15.5 GB).

Chunghwa from Taiwan is number 10 with 13.5 GB[3]. **Telia** Finland is the likely number 11 but since Telia doesn't report its mobile data traffic we have calculated it as the Finland total minus the sum of DNA and Elisa. This means that Telia's actual usage might be somewhat different[4]. Our top 13 ends with the only maturing market operator on this list, **Jio** from India, and **Nova** from Iceland. Unlike the other operators in the top, Jio's average usage didn't grow much in 1H 2019.

[3] Based on Q1 2019 data as Q2 isn't reported yet

[4] We recommend all operators to report their total mobile data traffic

Europe: Finnish operators and '3' dominate the top

Now to the first of three breakdowns: Europe. The number 1 and 2 of the world, **DNA** Finland and **Drei** (3) Austria, obviously top also this chart.

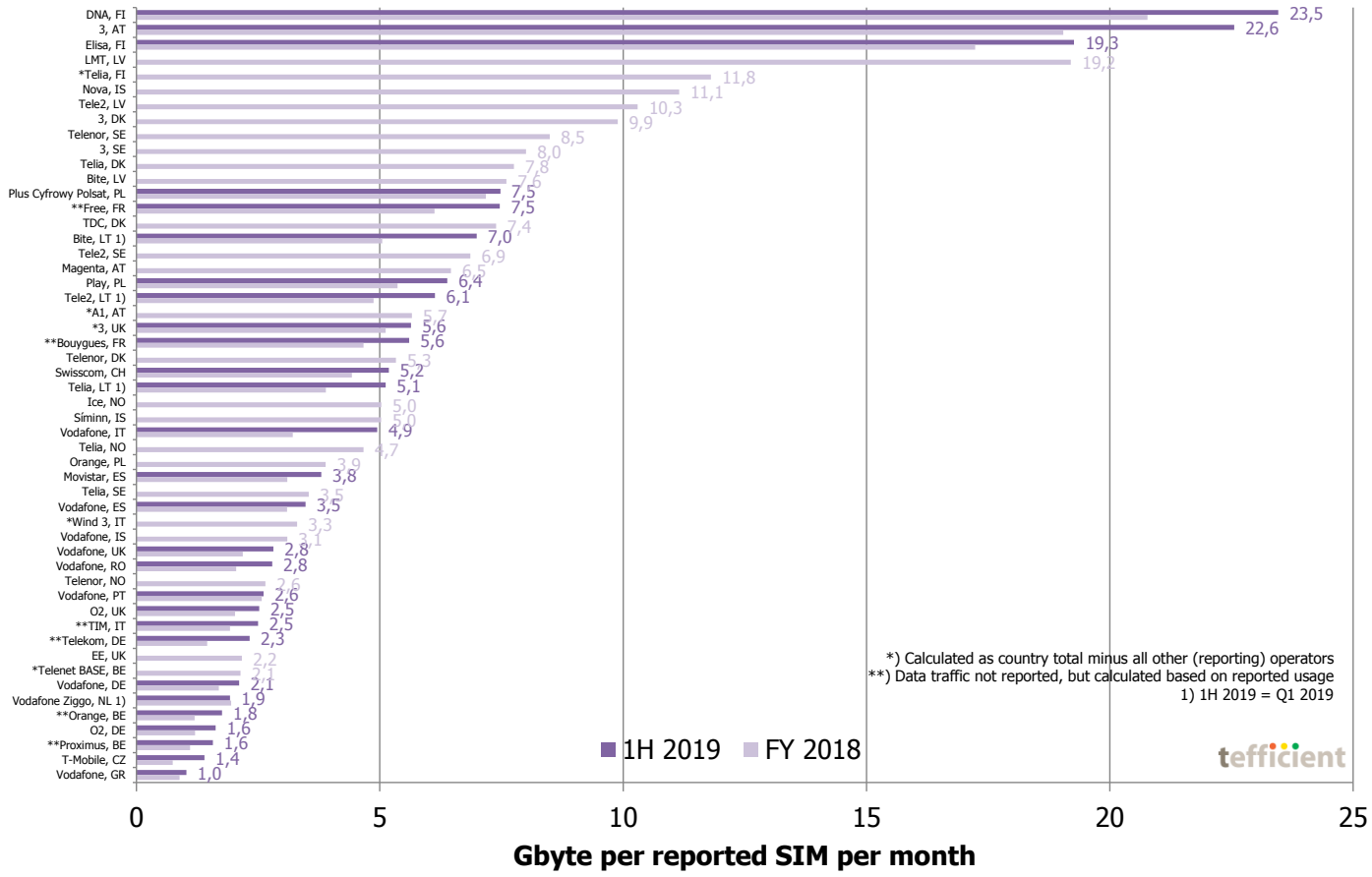


Figure 3. Average data usage per reported SIM per month – European operators

The top ten operators are either Finnish (**DNA**, **Elisa**, **Telia**), affiliates of '**3**' (Austria, Denmark, Sweden), **Latvian** (LMT, Tele2) or **Nova** from Iceland (a country that is added to this analysis).

The bottom eight operators are from the low usage markets[5] of **Greece** (Vodafone), **Czechia** (T-Mobile), **Belgium** (Proximus, Orange, Telenet BASE), **Germany** (O2, Vodafone) and the **Netherlands** (Vodafone Ziggo).

Who is then having the fastest usage growth in Europe[6]? It's again **Vodafone Italy** with **103%** – from 2.4 GB per month in 1H 2018 to 4.9 GB per month in 1H 2019. Also TIM has a relatively

[5] See our latest country data usage report https://tefficient.com/prepping-for-5g-monetisation-model-and-fwa-define-usage/

fast usage growth, 52%. What happened in Italy during this year? The new fourth operator, **Iliad**, launched 29 May. With very cheap (6-8 EUR) plans and large data buckets (30-50 GB), Iliad could go from zero to 3.8 million subscriptions in its first year of operation. The incumbent operators TIM, Vodafone and Wind 3 were quick to come out with similar offers – which clearly fuelled the mobile data consumption in Italy[7].

Another operator with fast usage growth is **T-Mobile Czechia**; 89%. Still playing in the bottom of Europe when it comes to usage, the introduction of 4G-based unlimited plans for home internet have had a significant impact on T-Mobile's overall usage in the past year. Our latest country report shows that these 'fixed LTE' subscriptions in Czechia represented 2.2% of the total mobile subscriptions in December 2018 but consumed a whopping 63% of the mobile data traffic in 2018. This might just be the start of Czechia's growth – in September T-Mobile started selling two unlimited mobile subscriptions meant for ordinary, smartphone, use: One less costly where the speed is throttled to 10 Mbit/s once 50 GB has been consumed – and one truly unlimited without a bucket or speed limitation.

At the other end of the usage growth scale we find **Vodafone Ziggo** from the Netherlands with just 6%[8] and **Vodafone Portugal** with 13% – but then follow some of the operators that are the most associated with **unlimited** in Europe:

- Plus Cyfrowy Polsat Poland +16%
- DNA Finland +18%
- Elisa Finland +19%
- 3 UK +20%
- Swisscom Switzerland +20%
- Drei (3) Austria +23%

The modest growth rates for these operators – known to have the highest share of unlimited subscriptions – are perhaps an indication of an upcoming **saturation** in mobile data usage. There's no policy that stops unlimited customers to use more data, yet we see lower growth rates[9]. Much of the growth in mobile data usage has perhaps so far come as a consequence of a gradual change in monetisation policy – allowing customers to shift some of their traffic from Wi-Fi to mobile – rather than a true underlying demand. In the next section, we will look into what looks to be saturation in mobile data usage in an unlimited market – but also establish support for that 5G might start a new growth wave for mobile data usage.

Early signs of saturation for Europe's 'unlimited' operators

[6] Measured among the operators that have reported data traffic for 1H 2018 and 1H 2019
[7] Iliad isn't reporting its mobile data traffic (yet?) and Wind 3 has regretfully stopped reporting it after VEON sold its share of the JV to CK Hutchison. In 1H 2018, Wind 3 had the highest data usage in Italy.
[8] Here measured 1H 2018 to Q1 2019 as Q2 2019 isn't yet reported
[9] The average for Europe was 38%

Asia and China: Taiwan fills the podium – but look in the rear mirror

The three Taiwanese operators **Taiwan Mobile**, **FarEasTone** and **Chunghwa**[10] hold the top three usage positions in Asia and China. Although we miss Q2 2019 for the Taiwanese operators, it's clear that the massive growth in mobile data usage stalled – more about that below.

As last time, **Jio** from India is fourth-ranked. In just three years, Jio went from zero to 331 million subscribers and Jio is now the largest operator in India when it comes to base. Already from start, Jio's mobile data usage has been very high (usage was, after all, free to begin with) and the growth rate is therefore also slow; **9%** from 1H 2018 to 1H 2019.

Malaysian operators **Maxis**, **Celcom** and **Digi** are ranked as number 5, 6 and 7. Korea's LG Uplus follows as number 8[11].

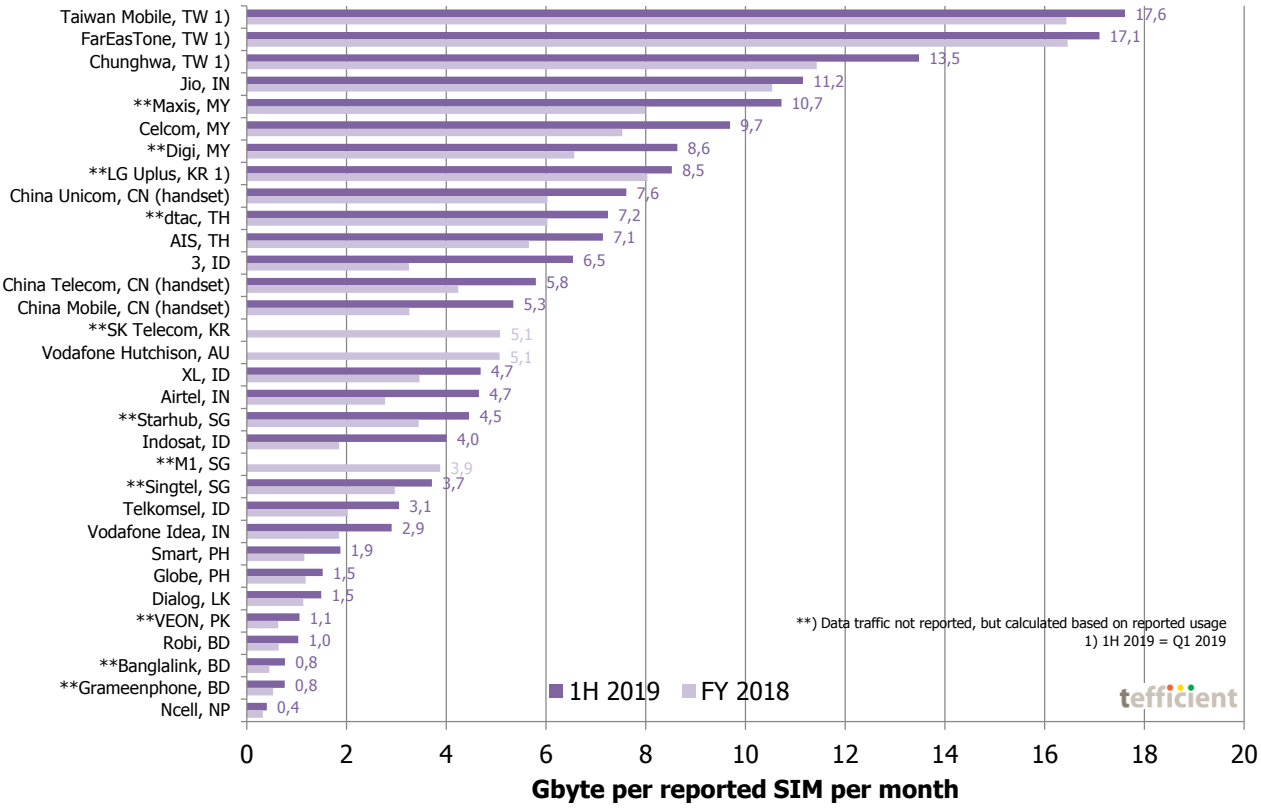


Figure 4. Average data usage per reported SIM per month – Asian and Chinese operators

[10] The operators aren't reporting their mobile data traffic themselves; it is being reported by the regulator with a certain delay. There are two other Taiwanese operators, T Star and Gt, but they are just reported together as 'other'. Their usage is in between Taiwan Mobile/FarEasTone and Chunghwa.

[11] Q2 2019 usage not yet reported

If you thought some of the European usage growth rates were impressive, let's look at the Asian/Chinese top list:

- 3 Indonesia +173%
- Indosat Indonesia +173%
- Airtel India +140%
- China Mobile +135%
- VEON Pakistan +115%
- Smart Philippines +109%
- Banglalink Bangladesh +108%
- Vodafone Idea India +102%
- Robi Bangladesh +102%

Nine operators **more than doubled** their mobile data usage in 1H 2019 compared to 1H 2018. Compared to our previous analysis, this is actually a slowdown.

Although data traffic grew quickly in **Indonesia**, the usage growth per SIM as shown above is exaggerated as tens of millions of SIM cards were disconnected as a consequence of the mandatory SIM registration process starting in April 2018. '3' and Indosat were hit the most – their SIM bases halved between the end of 2017 and early 2019.

Nine Asian and Chinese operators had >100% growth in data usage – but that's a slowdown

Taiwan: Usage growth stopped – what happened?

Although the Taiwanese operators are still in the lead Figure 4 when it comes to absolute data usage, the growth rate has slowed considerably since Q3 2018, see Figure 5.

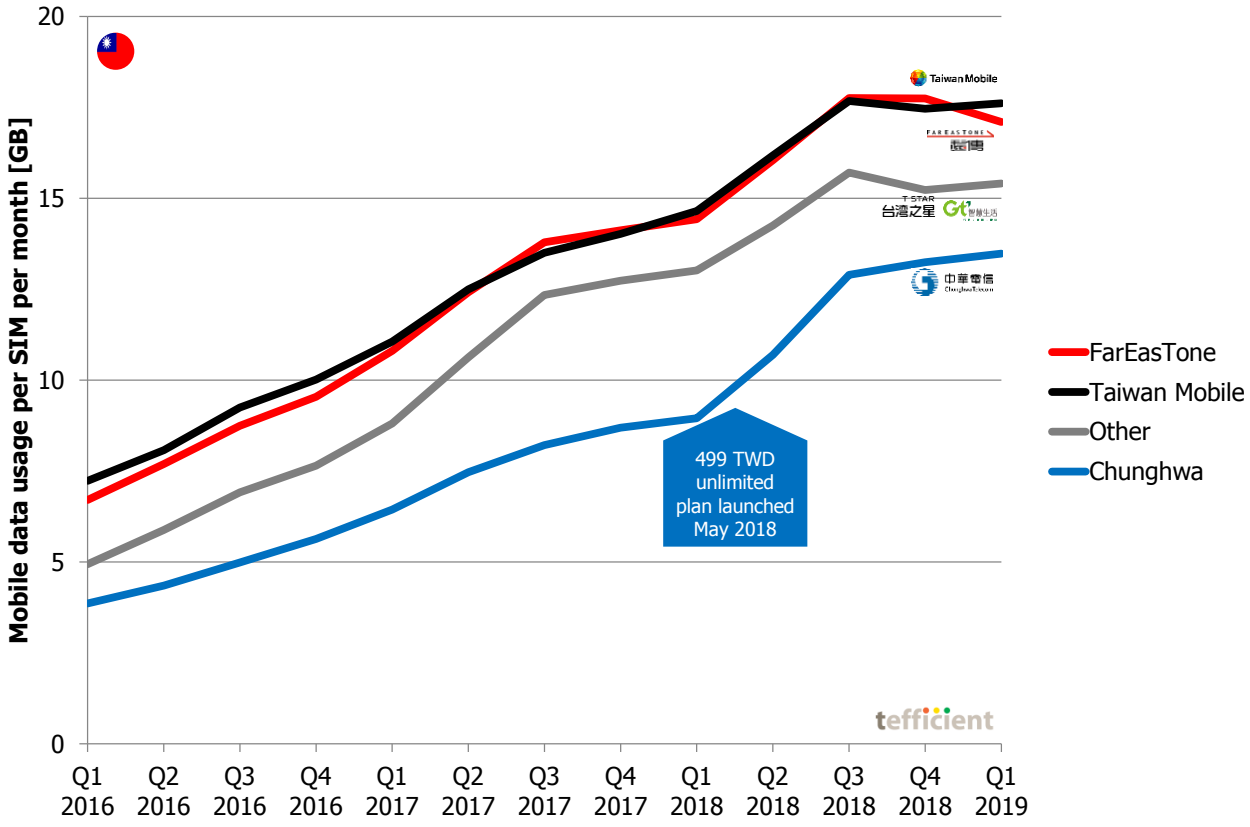


Figure 5. Average data usage per SIM per month – Taiwan[12]

Unlimited plans have been around in Taiwan for a long time, but new competition from the 4th and 5th MNO, Gt and T Star, has gradually made Taiwanese operators more and more generous with the entry prices for unlimited. When the market leader and incumbent, **Chunghwa Telecom**, made an unlimited mobile data plan available for everyone for just 499 TWD (14 EUR) in May 2018, it had an immediate effect on the data usage for Chunghwa. Since the competing operators Taiwan Mobile and FarEasTone followed, their data usage increased too.

The demand for the 499 TWD offer was actually so high that operator shops and customer service points were clogged with customers. The situation was so extreme that the Taiwanese regulator NCC fined the three operators for their chaotic introduction of the 499 TWD unlimited plans and for the poor customer service level delivered when millions of customers wanted to benefit from the new proposition.

[12] The Taiwanese operator figures originate from the regulator, NCC, and Q2 2019 hasn't yet been reported at the time of this analysis

But as shown in Figure 5, data usage plateaued in Q3 2018 and has not really increased since. For FarEasTone, Q1 2019 even represented a quarter-to-quarter decrease. The operators have pulled back some of the most aggressive unlimited propositions – but there are also rumours of operators throttling the speeds.

The competition and the reactive introduction of cheap unlimited plans has also led to a quite negative development of the mobile service revenues in Taiwan, see Figure 6.

In spite of unlimited, Taiwan's data usage plateaued in Q3 2018

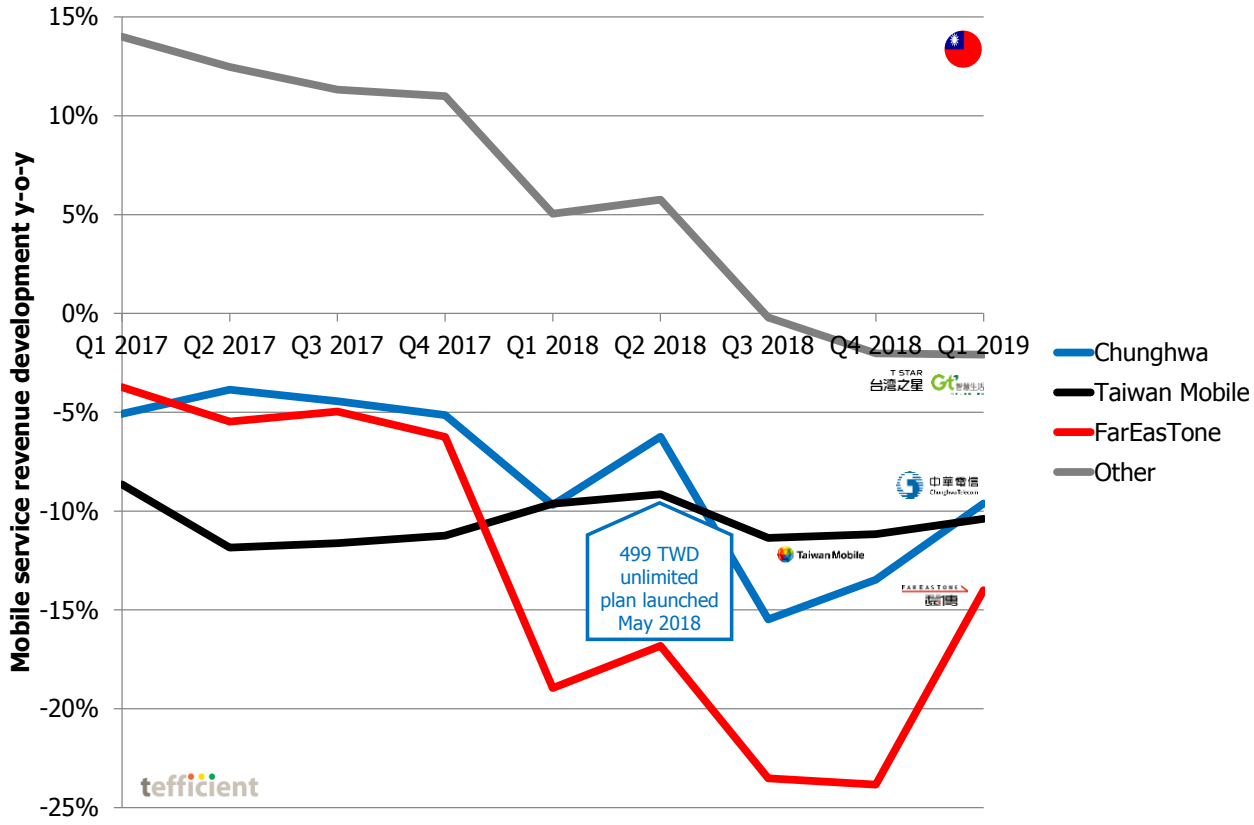


Figure 6. Development in mobile service revenue y-o-y – Taiwan[11]

The three large MNOs, Chunghwa, Taiwan Mobile and FarEasTone, have consistently been below the zero line, i.e. their mobile service revenues have been falling year-on-year. The two smaller MNOs, Gt and T Star – here represented as 'Other' – grew mobile service revenues until Q3 2018, i.e. until the quarter after the introduction of 499 TWD unlimited plans from the larger MNOs.

You might wonder why all operators experienced a recovery of mobile service revenue in the 499 TWD launch quarter (Q2 2018) – shouldn't that cheap plan affect revenues negatively? The explanation is the **penalty fees** that customers paid to get out of existing contracts to be able to join a 499 TWD plan. Figure 6 isn't containing Q2 2019 since the figures originate from the NCC and is reported with a certain delay, but

when studying the Q2 2019 reports of the operators, it's clear that these penalty fees in Q2 2018 created a yet tougher comparison in Q2 2019 – which means that the trend will look bad also for Q2 2019.

At the end of this analysis we will compare the revenue development between operators globally and you will then see that the Taiwanese market stands out quite negatively. Other unlimited, high-usage, markets – Finland is a good example – have been able to grow revenues, so Taiwan's journey shouldn't be attributed to unlimited but to a particularly competitive context.

South Korea: 5G was introduced – what happened to usage?

Since 2014, plans with unlimited data volume have been available in the Korean market. In contrast to Taiwan, Korea's operators SK Telecom, KT and LG U+ were much more careful in how they introduced unlimited.

Until 2018, plans with unlimited data volume were throttled to a certain speed[13] after a certain daily bucket was consumed, but early 2018, LG U+ introduced a *truly* unlimited 4G plan for a premium price. Competition followed, but only within premium price segments.

Combined 4G and 5G site in Seoul

When the three operators synchronously launched 5G services in the beginning of April 2019, it was however **KT** that made 5G synonymous with unlimited: Three out of their four 5G plans came with truly unlimited mobile data. In contrast, SK Telecom and LG U+ launched plans within the more premium segments that had big, but not unlimited, buckets. These were then throttled to a predefined speed once that monthly bucket was consumed.

More or less immediately after launch, SK Telecom and LG U+ revised their initial setup now saying that their most premium plans were unlimited too – but with a footnote saying that it would end when customers went out of their binding contract period. Their adjustment was likely an indication of that KT's truly unlimited premium plans were seen to sell well.

South Korea represents the only launched 5G market for which the regulator (and operators) have reported mobile data usage. Figure 7 compares the average mobile data usage for 4G subscriptions (blue) with that of 5G subscriptions (red).

[13] Set by the monthly price of the plan – the more you pay, the higher the throttling speed

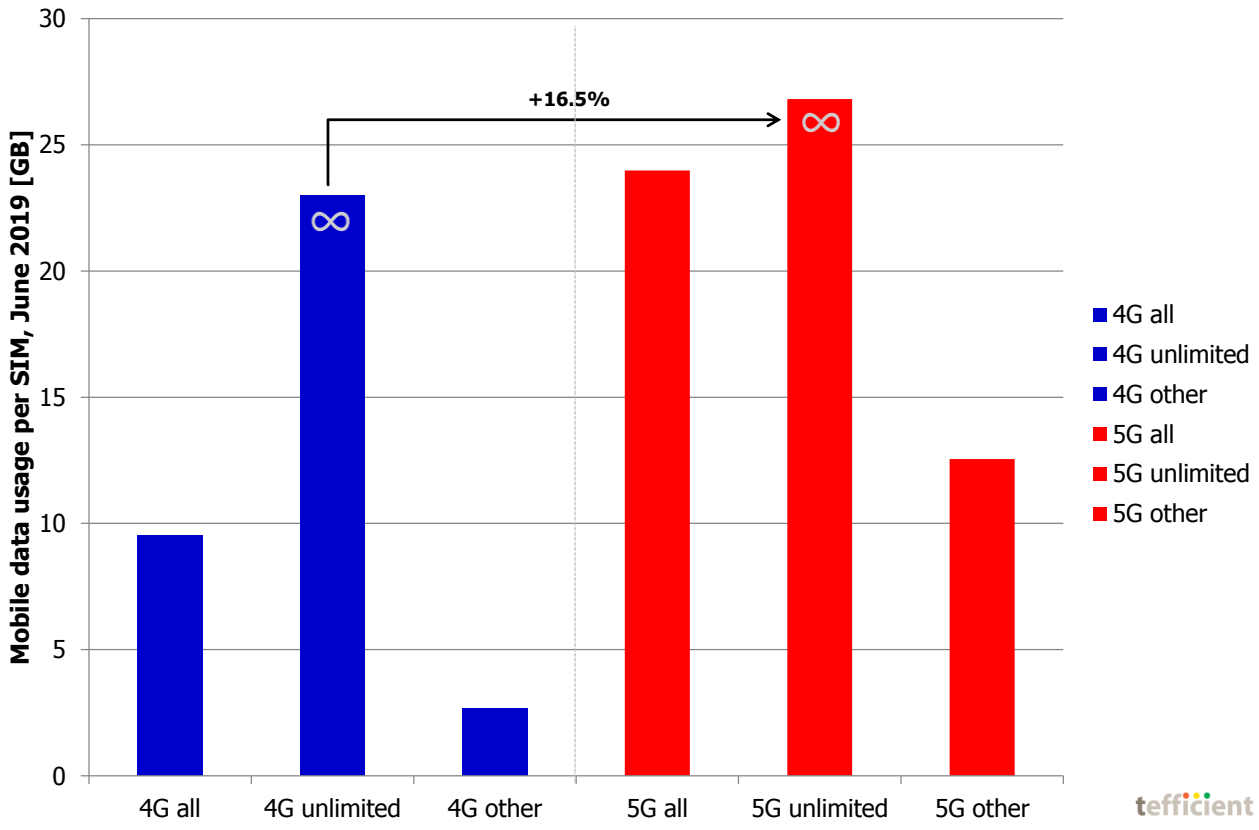


Figure 7. Mobile data usage per 4G and 5G SIM in June 2019 – South Korea[14]

If comparing the overall data usage ('4G all' vs. '5G all') one might draw the conclusion that 5G leads to a massive growth in data usage – from 9.5 GB to 24.0 GB. But we have to consider that the average 5G plan comes with much more data – often unlimited – compared to the average 4G plan. We are simply comparing plans with totally different allowance and totally different price.

Unlimited plans offer a much better comparability as these are priced in a similar way and have no limits in how many GBs a customer can use. In June, the average Korean 5G unlimited SIM consumed 26.8 GB whereas the average 4G unlimited SIM consumed 23.0 GB. Unlimited-to-unlimited, 5G thus seems to have increased usage **16.5%**. One explanation to this might of course be a better customer experience, encouraging users to consume more – or streaming services to more often ask for content in a maximum resolution now that the connection is so fast. The 5G smartphones currently sold are top-notch when it comes to screen resolution.

Unlimited-to-unlimited, 5G increased usage 16.5% in June

The importance of video as a contributor to mobile data usage is apparent if looking at Figure 8 below. This data originates from MSIT, the ministry, and shows the traffic distribution per type – *for the top 30 sites* in Korea.

[14] As reported by the ministry, MSIT

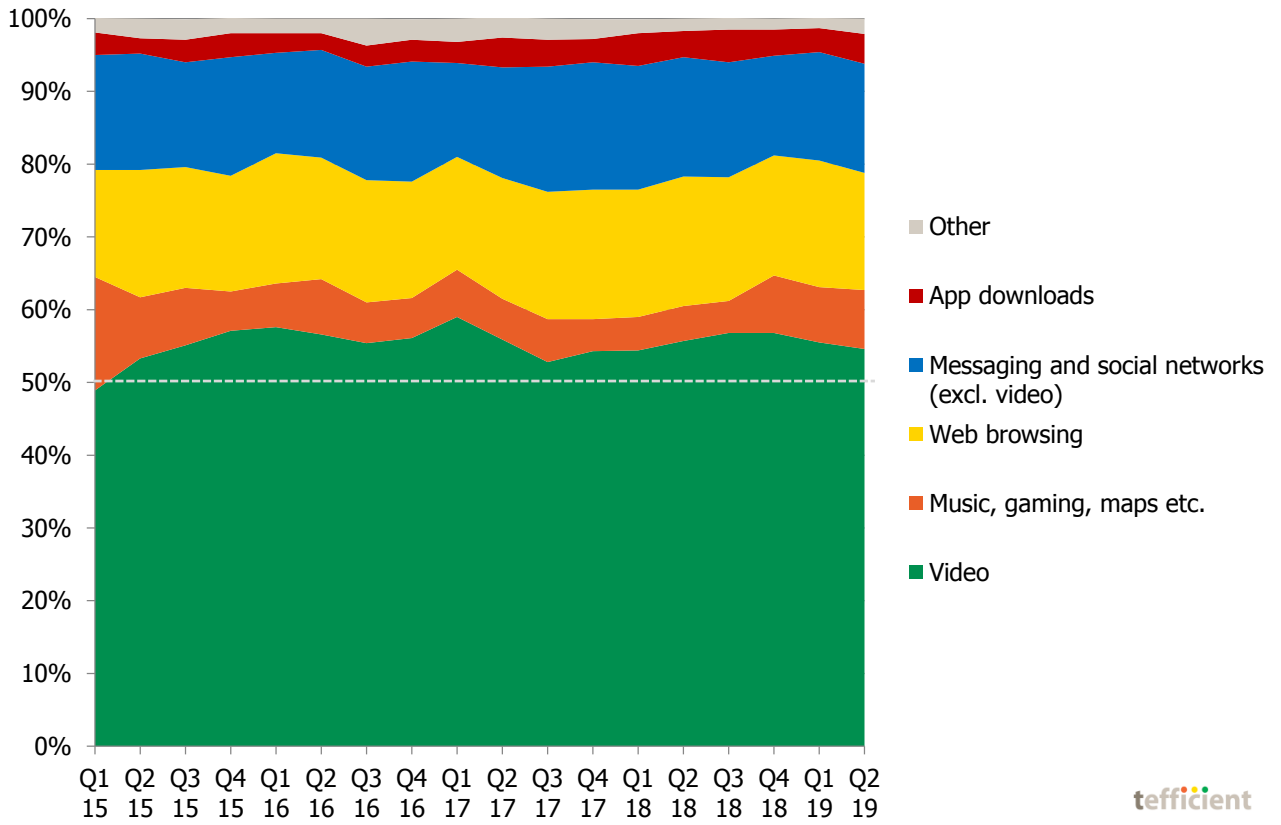


Figure 8. Mobile data usage per 4G and 5G SIM in June 2019 – South Korea[15]

It shows that video stands for **more than 50%** of the total traffic – but also that the distribution between different traffic types hasn't changed that much in the past four years. What Figure 8 doesn't show is how the total mobile traffic to the top 30 sites developed; **2.3x** during the same time period. With video constantly being more than 50%, it's obvious just how instrumental video is for the overall mobile traffic growth. This could support a view that it's screen resolution (rather than 5G) that currently drives the usage growth observed between 4G and 5G. The 5G experience in Korea is – so far – a smartphone experience.

The Korean market leader **SK Telecom** isn't regularly reporting mobile data usage. But to celebrate its millionth 5G customer, SK Telecom issued a release containing mobile data usage stats for SK Telecom customers *who changed from 4G to 5G*, see Figure 9.

[15] As reported by the ministry, MSIT

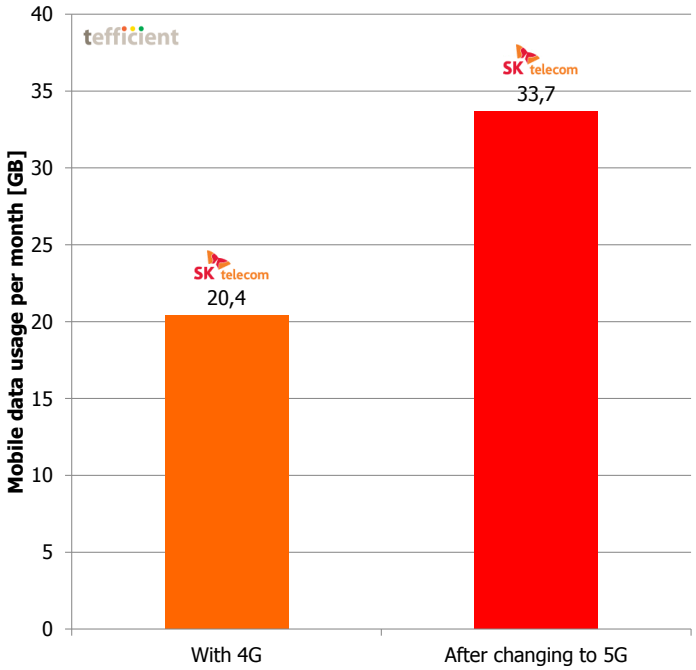


Figure 9. How mobile data usage developed for customers upgrading from 4G to 5G – SK Telecom

According to SK Telecom, these upgrading customers averagely consumed 33.7 GB when on 5G whereas they only consumed, on average, 20.4 GB before when on 4G. That represents a usage growth of **65%.** What we don't know is what type of *plan* change these customers have done to get 5G. As most 5G plans are premium plans, there might have been a significant upgrade in the bucket size when going from 4G to 5G. The change in Wi-Fi usage behaviour could indicate this: Customers with 5G are **37% less time on Wi-Fi** than they were before, according to SK Telecom.

SK's customers upgrading to 5G spent 37% less time on Wi-Fi than what they did when they had 4G

RoW: Zain dominates the top

The rest of world ranking combines Latin American and Russian/CIS operators with operators from Middle East, Africa and reporting international groups, see Figure 10.

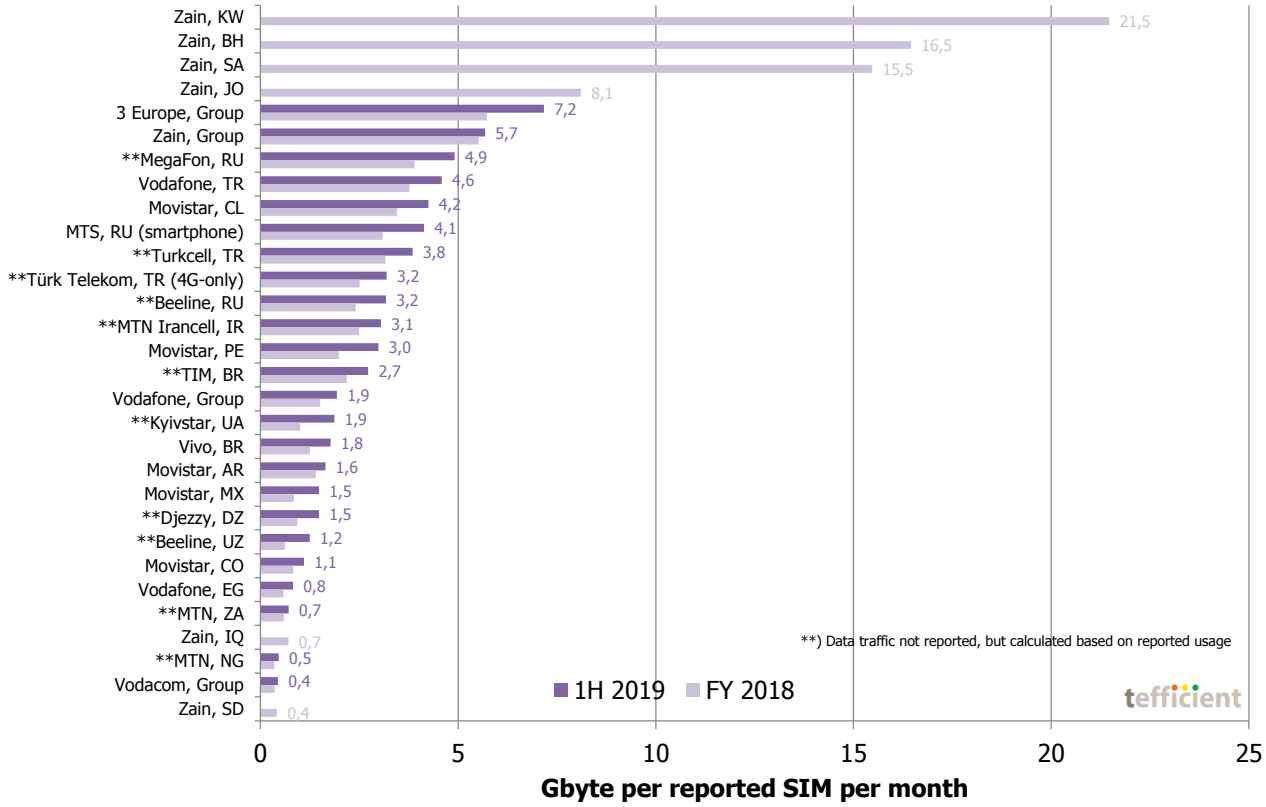


Figure 10. Average data usage per reported SIM per month – RoW operators

If we disregard **3 Europe** group whose affiliates are represented in the European comparison (Figure 3), it's interesting to see how high the average usage of **Zain** Group is. The average is lifted by Kuwait, Bahrain, Saudi Arabia and Jordan whereas Iraq and Sudan lower it.

Russian and Turkish operators have high average usage. The Latin American operators have – with the exception of Chile – fairly low average usage.

It is a pity that none of the US or Canadian operators report their data traffic or usage. Our country analysis[16] shows that mobile customers in Canada pay very much for the data they consume. Canadian operators might refrain from reporting these numbers to not open up to further criticism – but it's unclear why the US operators don't want to report their figures.

None of the North American operators report traffic or usage – why?

[16] Latest version: https://tefficient.com/prepping-for-5g-monetisation-model-and-fwa-define-usage/

African operators are – together with Zain Iraq – having the lowest monthly data usage per SIM in our sample.

Four operators had three figure growth rates in the twelve months ending June 2019: Ukraine's **Kyivstar** (+200%), **Beeline** Uzbekistan (+162%), **Movistar** Mexico (+122%) and Algeria's **Djezzy** (+110%).

China Mobile carried 29830 PB in 1H 2019 – +144% y-o-y

We have seen that the data usage varies much between customers of different operators in different countries. If we instead compare the total data traffic, the large population differences between the countries make the spread even wider, see Figure 11.

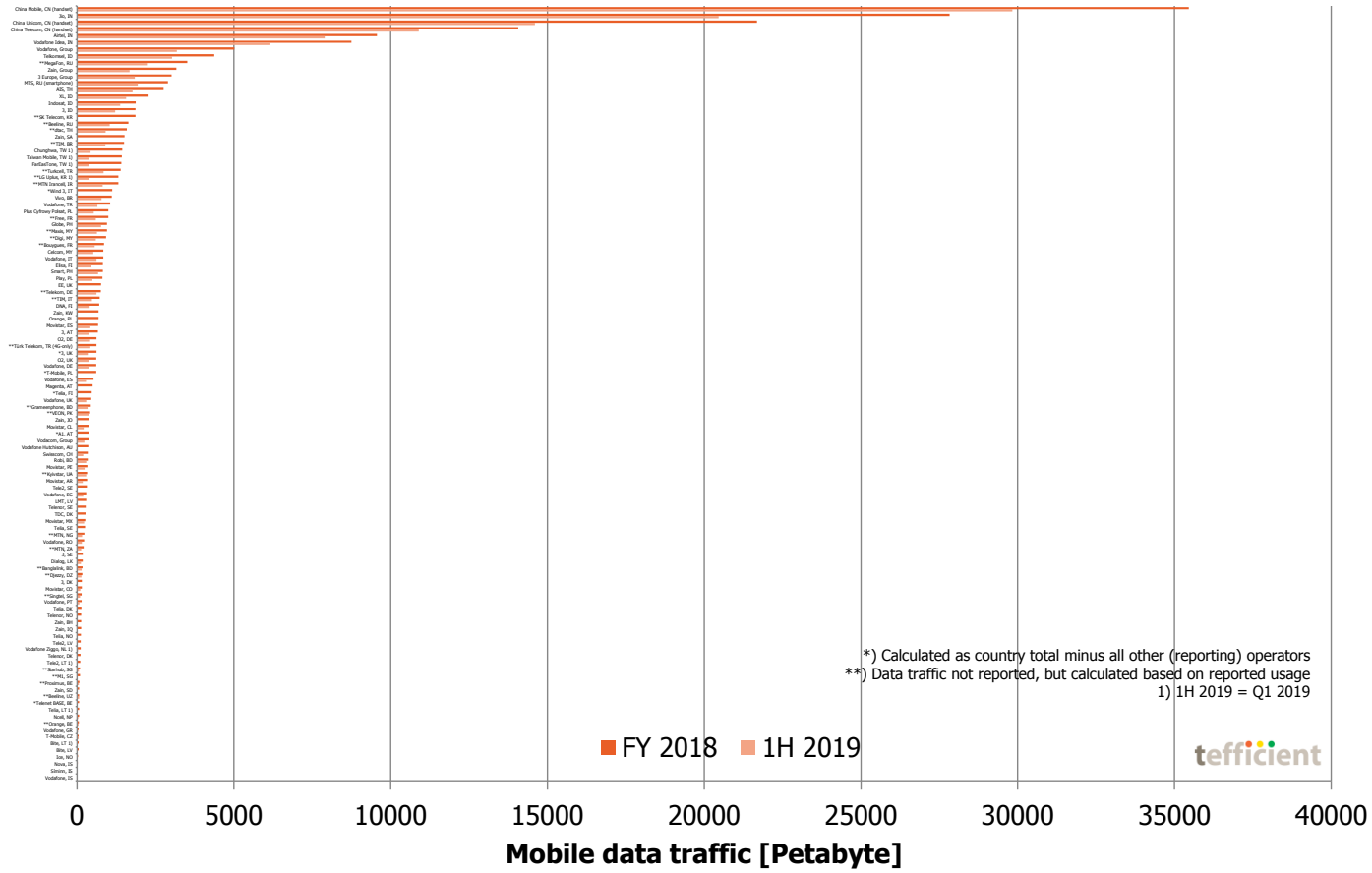


Figure 11. Total data traffic – all operators

As it's impossible to read Figure 11 we will in a bit break it down into the three regions of the world, but let's first identify the **global data traffic leaders** – see Figure 12.

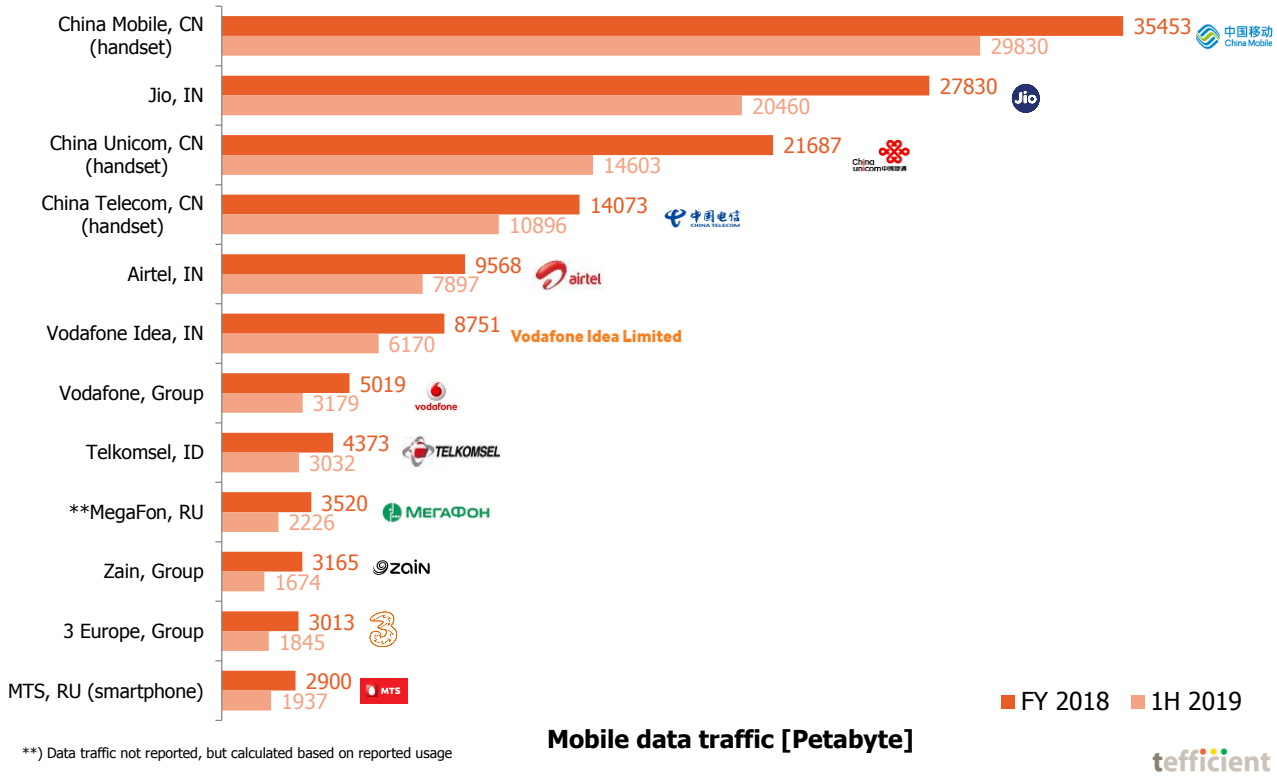


Figure 12. Total data traffic – top 12 operators

China Mobile has 935 million mobile subscribers but only became the largest operator in the world in mobile data traffic during 2018. Its total handset traffic grew **144%** from 1H 2018 to 1H 2019.

The Indian challenger **Jio** continued to grow its subscription base very quickly in 1H 2019, reaching 331 million mobile subscriptions in June 2019 – something that makes Jio India's largest mobile operator in subscription base. The data traffic growth 1H 2018 to 1H 2019 was **78%**. Airtel India had a traffic growth of **114%** whereas newly merged Vodafone Idea had **70%**. As shown in the previous section on usage, Jio's usage *per subscription* didn't grow much in 1H 2019 – just 9%.

China Unicom is the Chinese operator with the highest average usage per subscription. Relative to China Mobile, Unicom's subscription base is small, though: Just 324 million. The total handset data traffic of Unicom grew slower than China Mobile's and China Telecom's: **62%** in 1H 2019.

Note that Vodafone Group (excluding India) only comes in as number 7 even though it consists of about 20 countries. It says something about the size of the Chinese and Indian operations.

Europe: The largest operators are not the operators with the biggest base

First to the European breakdown. Since the highest ranked European operator is just number 28 in our global rank, we could generally conclude that the European countries are less populated than the global leaders – but also that growth is significantly faster outside of Europe. And it's not the operators that you necessarily would suspect (with the largest SIM base) that are in the top of Figure 13.

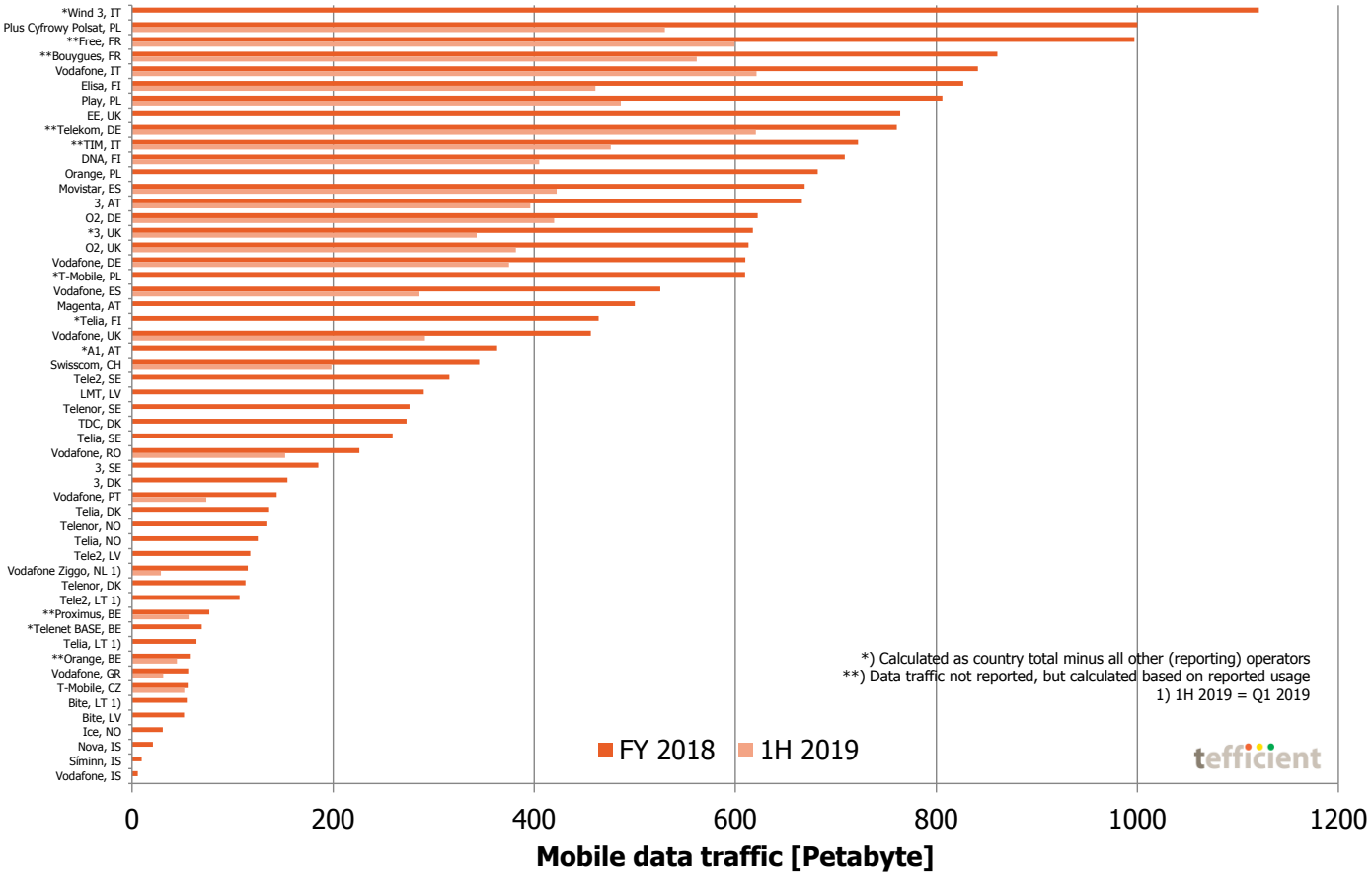


Figure 13. Total data traffic – European operators

The Italian operator **Wind 3** is likely[17] Europe's largest operator in total data traffic.

Poland's **Plus/Cyfrowy Polsat** takes the runner-up position albeit a modest 18% growth in traffic in the twelve months to June 2019. France's **Free** takes the third place in Europe with a growth of 28%.

[17] CK Hutchison has taken over the full ownership of Wind 3 and as it was their previous shareholder VEON that reported data usage, we miss input from Wind 3. In this analysis we have assigned Italy's residudal traffic (subtracting the traffic of TIM and Vodafone from the Italian total) to Wind 3. The new 4th MNO Iliad entered the market but we assume that all of Iliad's traffic in 2018 was carried on Wind 3's network through the national roaming agreement. Iliad said it took its first 400 sites into operation in 1H 2019.

We have no operators with three digits growth rates in Europe. The operators with the fastest growing traffic are:

- Vodafone Italy 92%
- T-Mobile Czechia 90%
- Orange Belgium 86%

It's interesting to note that with the exception of Vodafone Portugal (16%), the European operators with the slowest traffic growth 1H 2018-1H 2019 are operators that are synonymous with **unlimited**:

- Drei (3) Austria 25%
- DNA Finland 21%
- 3 UK[18] 20%
- Elisa Finland 19%
- Plus/Cyfrowy Polsat Poland 18%
- Swisscom Switzerland 17%

The European operators renowned for unlimited had slow traffic growth

In position six, we find **Elisa** from Finland. With Finland's 5.5 million inhabitants, it is impressive to find Elisa carrying as much traffic as operators from e.g. Germany, Italy, France and the UK. Elisa's local competitor **DNA** is number 11 in Europe.

[18] We do not any longer regard 3's reported data usage as representative for the whole reported active subscriber base. EE did for the first time report its traffic in 2018 and as the regulator Ofcom improved its traffic reporting, we have therefore assigned 3 with the residual country traffic after having subtracted EE, O2 and Vodafone. We asked 3 for a definition of their reported data usage, but 3 answered that it wasn't public.

Asia and China: Quick traffic growth

We find the six global traffic leaders in the top of the Asian/Chinese comparison: **China Mobile**, **Jio**, **China Unicom**, **China Telecom**, **Airtel** and **Vodafone Idea**. As shown in the global section, the 1H 2018 to 1H 2019 growth rates are high for all these operators (62-144%).

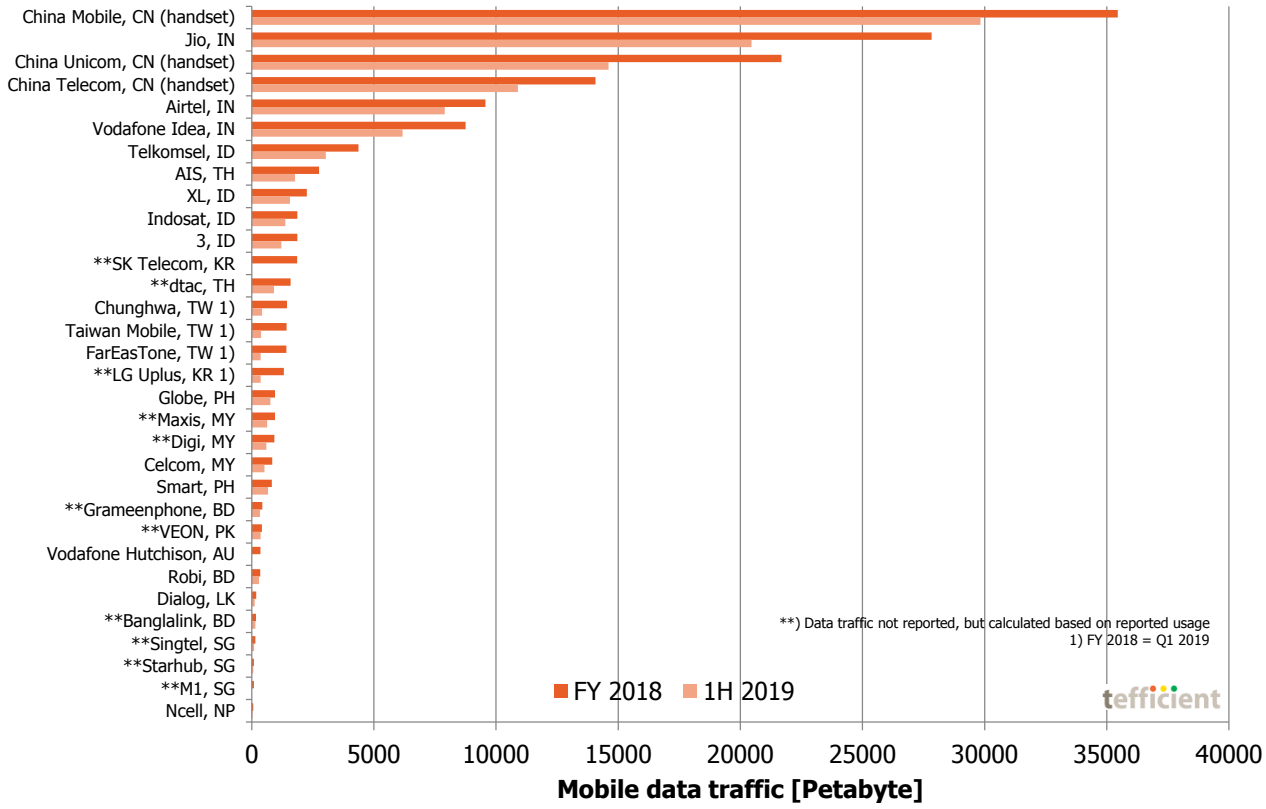


Figure 14. Total data traffic – Asian and Chinese operators

The **Indonesian** operators (Telkomsel, XL, Indosat and '3') and the **Thai** operators (AIS, dtac) follow together with Korea's **SK Telecom**. Although not matching the traffic growth of most of the Chinese and Indian operators, these operators have experienced pretty fast traffic growth:

- Indosat Indonesia +69%
- XL Indonesia +64%
- Telkomsel Indonesia +56%
- AIS Thailand +49%
- 3 Indonesia +46%
- dtac Thailand +32%

Faster still is the traffic growth of two new operators in our analysis – both from the **Philippines**: Globe, the market leader, had **96%** growth in data traffic in between 1H 2018 and 1H 2019 whereas second-ranked Smart had **113%**.

Yet faster growth had **VEON** Pakistan (+128%), **Robi** Bangladesh (+119%) and **Banglalink** Bangladesh (+115%). But on top of them all is the world's largest operator, **China Mobile**, with 144%.

Fastest traffic growth in Pakistan, Bangladesh and Philippines – but China Mobile trumps all

RoW: MegaFon larger than 3 Europe Group and Zain Group

Figure 15 collects operators from the rest of the world, but also a few reporting international groups.

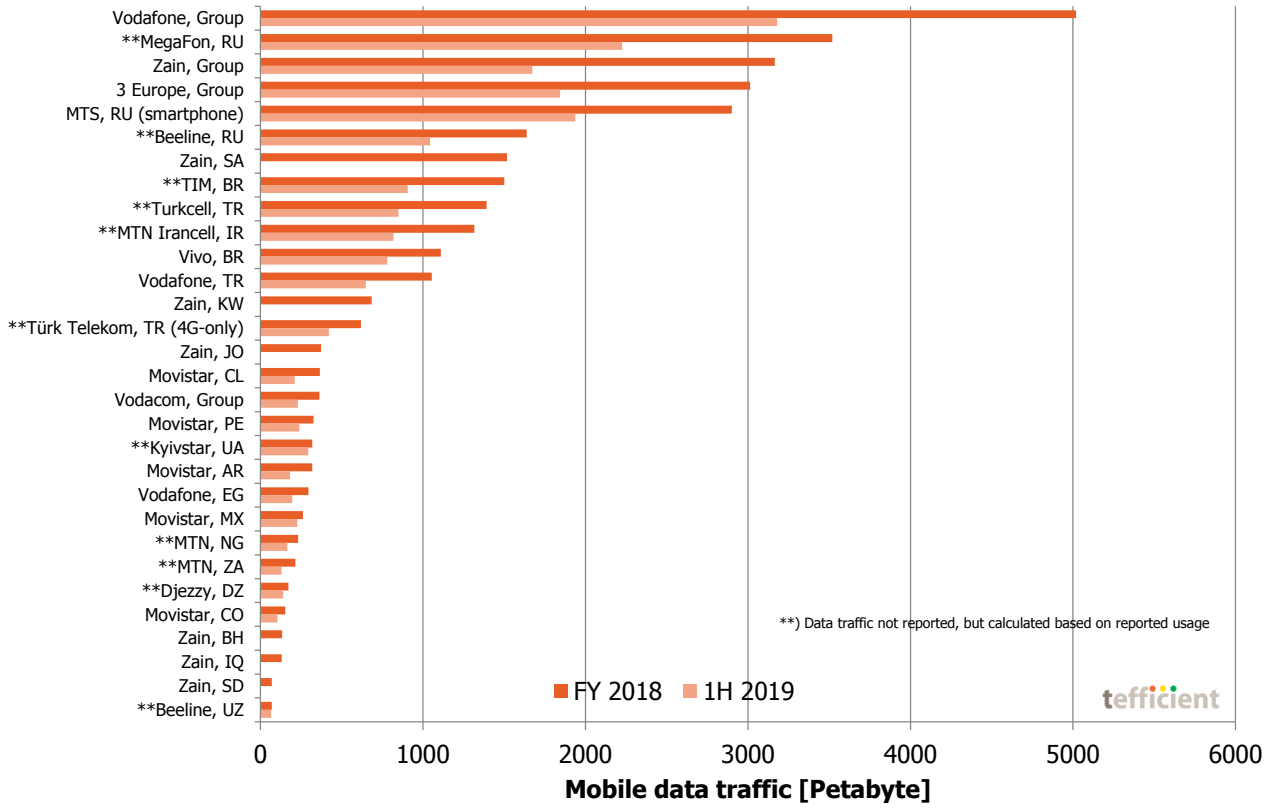


Figure 15. Total data traffic – Rest of world operators

The Russian operator **MegaFon** (#2) is an international giant in mobile data, carrying more traffic than the whole of 3 Europe Group and the whole group of Zain. Even though MegaFon's local competitors MTS and Beeline (VEON) are large too, MegaFon is larger. This can be traced back to MegaFon's acquisition of the 4G data-only specialist Yota back in 2013.

Saudi, Turkish and Brazilian operators follow – together with **MTN Irancell**, an operator with 45 million subscribers showing an increasing appetite for mobile data.

The operators with the fastest growth in mobile data traffic 1H 2018 to 1H 2019 are:

- Kyivstar Ukraine +198%
- Beeline Uzbekistan +145%
- Movistar Mexico +123%
- Djezzy Algeria +116%

How much money can you make on mobile data?

The way we calculate revenue per gigabyte – *total* mobile service revenue per carried gigabyte – will resonate with mature markets where operators generally aren't attempting to monetise voice and SMS based on usage. Instead they have made voice and messaging allowances unlimited and included them in a flat fee.

In *maturing* markets, usage-based monetisation is still used to a higher degree. This is true also for voice and messaging. With our calculation method, one might think that the operators ending up with the highest effective revenue per gigabyte would thus be operators from maturing markets. You do find three African operators in the lower parts of Figure 16 accompanied by Zain Iraq – but otherwise the operators with the highest revenue per GB are from eight European countries: **Greece**, **Belgium**, **Norway**, **Czechia**, **Germany**, the **Netherlands**, the **UK** and **Switzerland**.

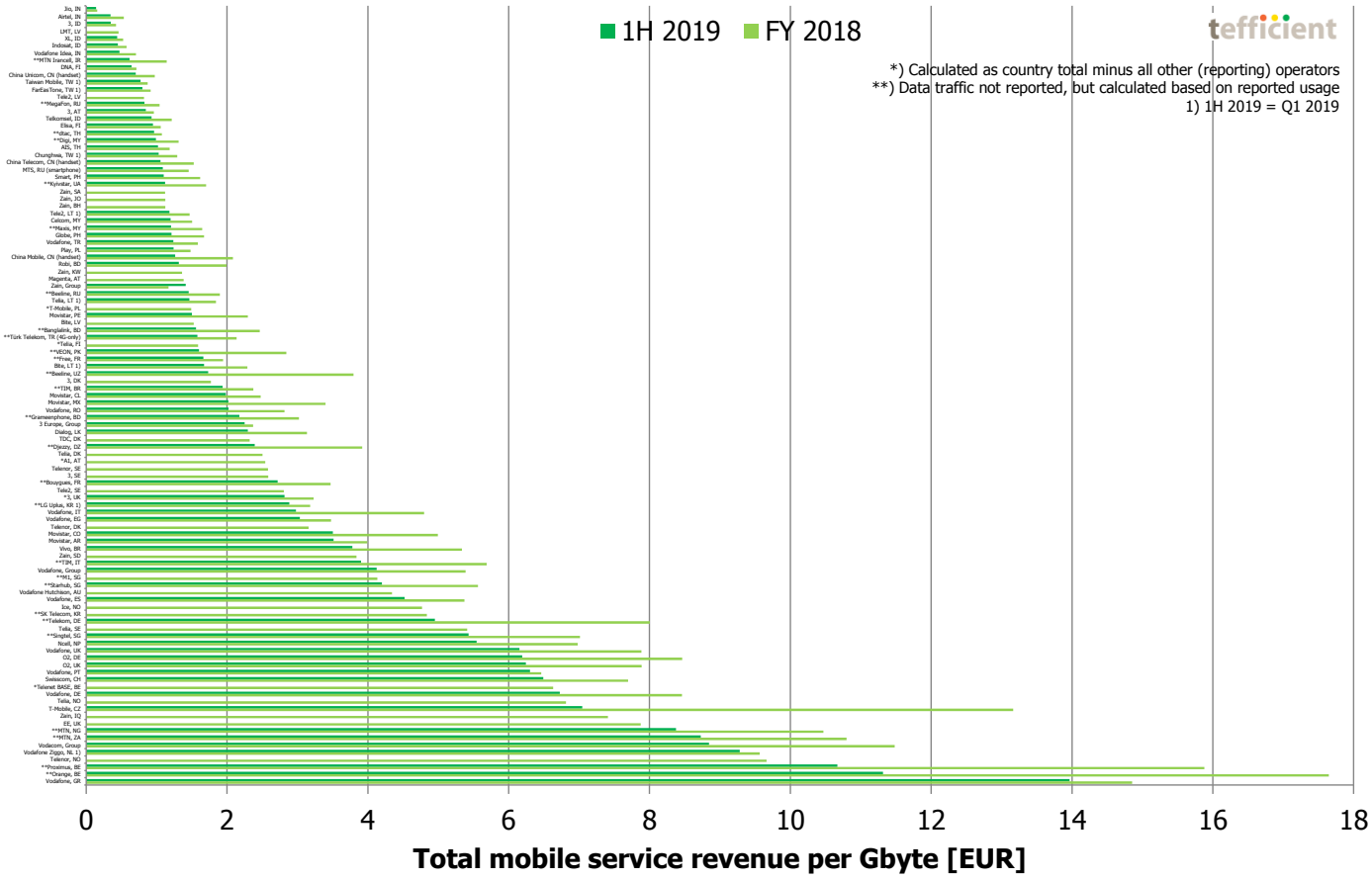


Figure 16. Total mobile service revenue per gigabyte – all operators[19]

[19] That also report mobile service revenue

We will – for readability reasons – soon break Figure 16 down into Europe, Asia/China and RoW, but let's first look into a disclaimer with regards to operators marked with * or **.

When reporting mobile data traffic, take inspiration from Vodafone and Telefónica

All graphs in this analysis carry this legend:

*) Data traffic calculated as country total minus all other (reporting) operators
**) Data traffic not reported, but calculated based on reported usage

There are a number of operators globally that, in their regular easy-to-use Excel sheets, report their **total mobile data traffic** quarter by quarter. Of the larger operators groups, **Vodafone** and **Telefónica** are two good examples. We encourage all operators to follow their example.

Some operators are instead reporting – or occasionally indicating – **data usage**. These are the operators marked with **. The problem here is that many operators aren't defining what a user is – sometimes it is all users, sometimes "active data users" (whatever that is), sometimes smartphone users, sometimes branded smartphone users, sometimes postpaid users, sometimes 4G users. Typically these usage numbers are stated to impress, i.e. they are representative only for a smaller, high-usage, segment of the subscriber base. Exceptions to that operators reporting usage aren't reporting the number of associated users are e.g. **VEON** Group, **MTN** Group and **AIS** that report the usage per mobile data customer *and* the number of such mobile data customers (a subset of the total customer base). Well done.

The majority of operators are still not reporting anything, though. Orange Group and Telia Company are examples of it. And, of course, all North American carriers. In some cases, country regulators are helpful in reporting a breakdown per operator. But in most cases, the country regulator is just reporting a total. In such occasions – and if also all other operators report data traffic or at least usage – we have calculated the country residual and assumed that this traffic equals that of the non-reporting operator. These are the operators marked with *.

It's not necessarily so that a regulator and the reporting operators use exactly the same definition when reporting data traffic. Traffic via MVNOs can e.g. disturb the comparability. Where the error risks to be the largest, though, is in countries where the country residual has been assigned to a *-marked operator while, at the same time, one or several of the other operators are **-marked operators, i.e. have not explicitly reported the total data traffic but some type of usage.

So if any operator (*-marked or **-marked) is unhappy with its calculated data traffic, the solution is simple: Start to report your total mobile data traffic.

Having explained this, let's now in Figure 16 identify the ten operators that get the *lowest* total mobile service revenue per gigabyte in the world:

	FY 2018	1H 2019
1. **Jio**, India	0.2 EUR	0.1 EUR ↓
2. **Airtel**, India	0.5 EUR	0.3 EUR ↓
3. **3**, Indonesia	0.4 EUR	0.3 EUR ↓
4. **LMT**, Latvia	0.5 EUR	n/a
5. **XL**, Indonesia	0.5 EUR	0.4 EUR ↓
6. **Indosat**, Indonesia	0.6 EUR	0.5 EUR ↓
7. **Vodafone Idea**, India	0.7 EUR	0.5 EUR ↓
8. **MTN Irancell**, Iran**	1.1 EUR	0.6 EUR ↓
9. **DNA**, Finland	0.7 EUR	0.6 EUR ↓
10. **China Unicom**, China (handset)	1.0 EUR	0.7 EUR ↓

These operators are either active in mature high data usage markets (Latvia, Finland) or in highly competitive maturing markets (India, Indonesia). For the first time we have a Chinese operator, China Unicom, on the list. MTN Irancell has also joined the list – much due to the financial crisis in the country putting pressure on the revenue as reported by its 49% shareholder, MTN.

The ten operators that get the *highest* total mobile service revenue per gigabyte in the world are:

	FY 2018	1H 2019	
1. **Vodafone**, Greece	14.9 EUR	14.0 EUR ↓	
2. **Orange**, Belgium**	17.6 EUR	11.3 EUR ↓	
3. **Proximus**, Belgium**	15.9 EUR	10.7 EUR ↓	
4. **Telenor**, Norway	9.7 EUR	n/a	
5. **Vodafone Ziggo**, Netherlands 1)	9.6 EUR	9.3 EUR ↓	1) 1H 2019 = Q1 2019
6. **Vodacom**, Group	11.5 EUR	8.8 EUR ↓	
7. **MTN**, South Africa**	10.8 EUR	8.7 EUR ↓	
8. **MTN**, Nigeria**	10.5 EUR	8.4 EUR ↓	
9. **EE**, UK	7.9 EUR	n/a	
10. **Zain**, Iraq	7.4 EUR	n/a	

In our mature market focused country analysis you can identify Belgium, Germany, Greece and the Netherlands as some of the country markets (of the covered) with the highest revenue per gigabyte so this list seems plausible.

We conclude that there in 1H 2019 there was a **99x difference** between the operator with the highest total service revenue per gigabyte (Vodafone Greece) and the operator with the lowest (Jio India).

Europe: Wide spread in the revenue per GB

Figure 17 shows the European breakdown. Since European operators played both in the bottom and in top of the global chart, the spread is almost as large as in the global view. To ease comparability, the scale is kept intact throughout this section.

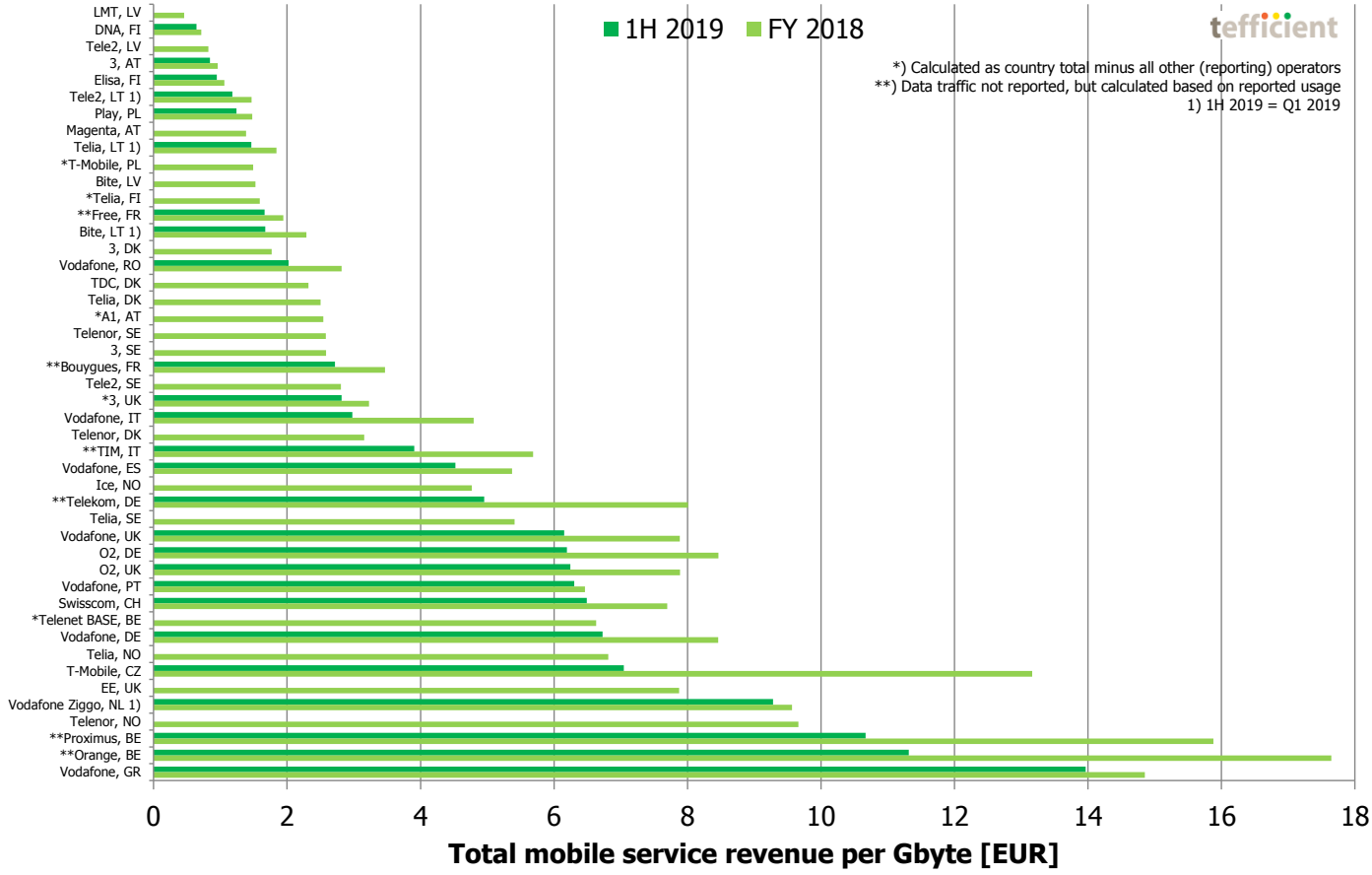


Figure 17. Total mobile service revenue per gigabyte – European operators

As pointed out in the global section, Greek, Belgian, Norwegian, Czech, German, Dutch, UK and Swiss operators play in the bottom of the graph – where the total service revenue per consumed gigabyte is high. In the other end of the scale – where the revenue per gigabyte is low – we find operators from **Latvia**, **Finland**, **Austria**, **Lithuania** and **Poland**.

Asia and China: Revenue per GB decreasing, but not as fast as before

Figure 18 shows the Asian and Chinese operators. Indian and Indonesian operators have the lowest revenue per gigabyte whereas no operator is having very high revenue.

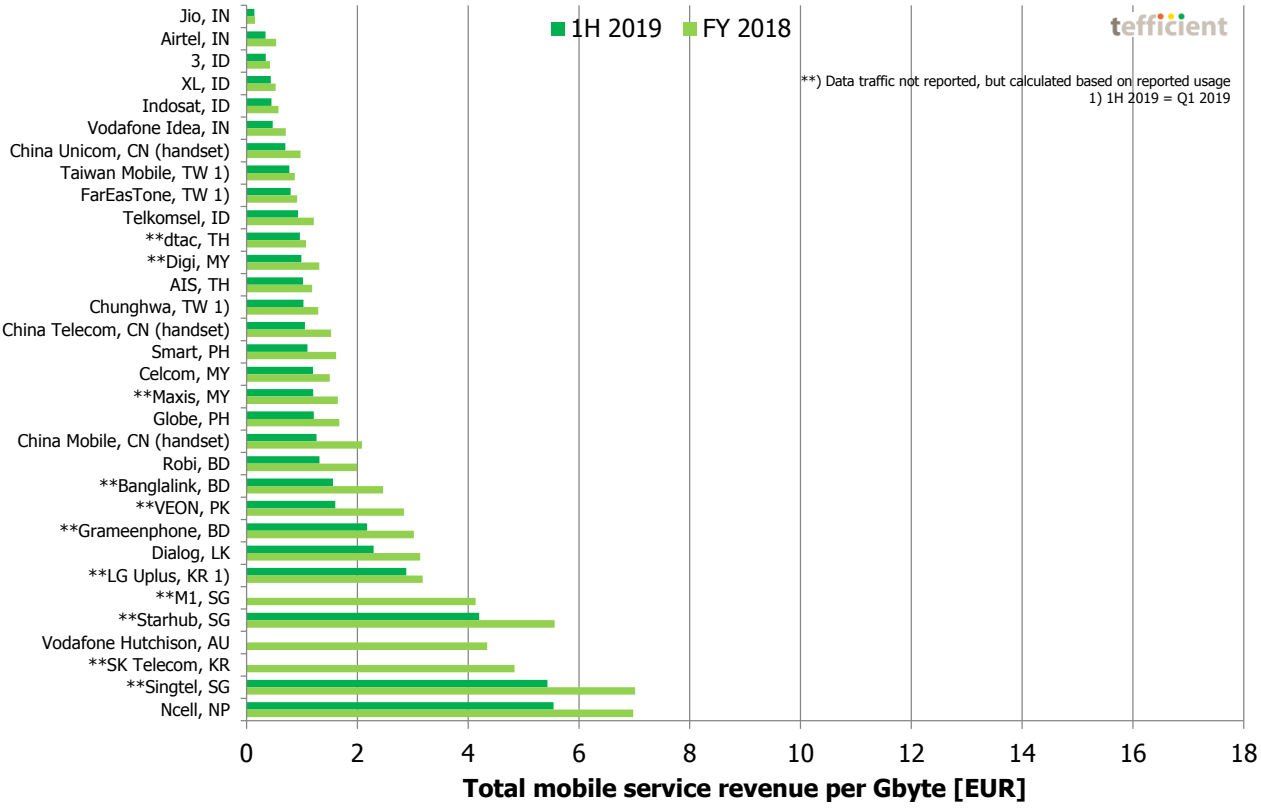


Figure 18. Total mobile service revenue per gigabyte – Asian and Chinese operators

The erosion in revenue per gigabyte in Asia/China is no longer as quick as it has been in our previous reports. In most cases, data usage has also reached high levels – of these operators, only Bangladesh's Banglalink and Grameenphone plus Nepal's Ncell were below 1 GB per SIM per month in 1H 2019.

RoW: Big drop in revenue per GB in certain maturing markets

We are ending this section with Figure 19 – showing the operators in the rest of the world alongside a few groups that separate out mobile service revenue in their reporting.

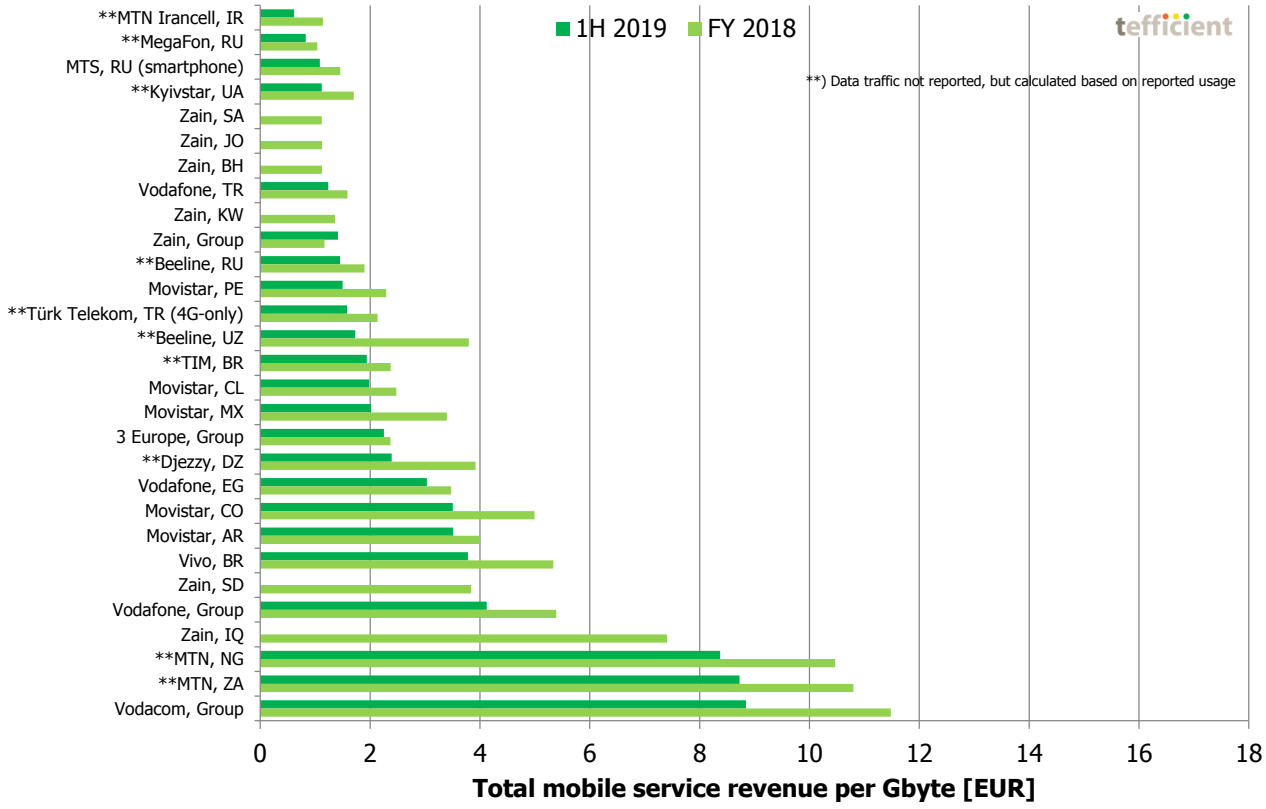


Figure 19. Total mobile service revenue per gigabyte – rest of world operators

MTN Irancell, Russian operators, Kyivstar from Ukraine and Zain's Middle East operations dominate the top of the chart where revenues are the lowest per gigabyte. Latin American operators clutter the middle of the chart whereas **sub-Saharan operators** populate the bottom of the graph.

Beeline Uzbekistan, MTN Irancell, Movistar Mexico and Djezzy from Algeria had very significant drops in the revenue per gigabyte in 1H 2019.

The revenue per GB vs. usage chart

Let us now combine the revenue per gigabyte with the usage. Those of you that have read our data usage and revenue analyses before are familiar with the **revenue per GB vs. usage** chart. But where it is normally populated with countries, it is here populated with operators, see Figure 20.

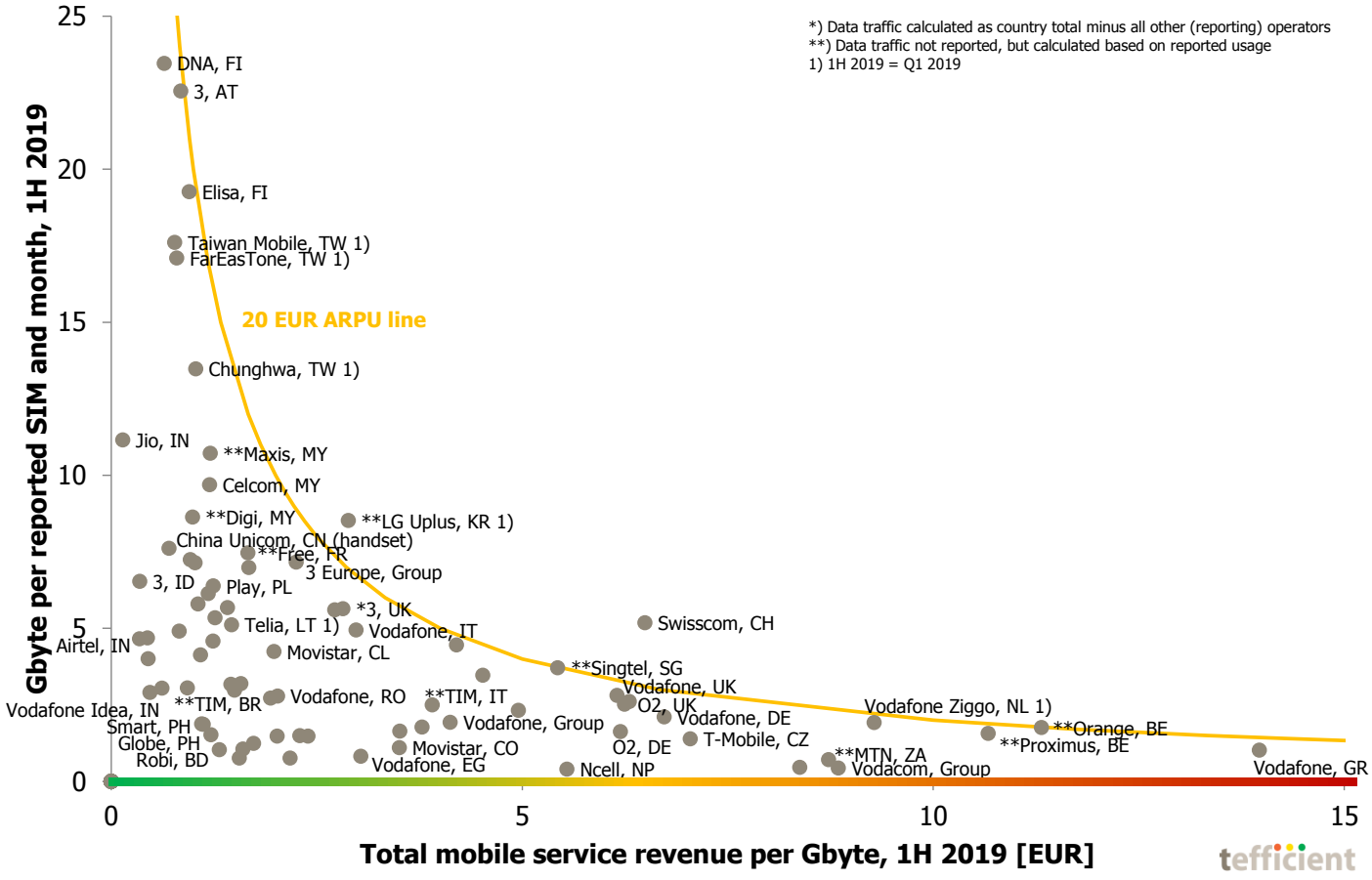


Figure 20. Mobile data usage vs. total mobile service revenue per Gbyte

With all those markers, we have only been able to highlight the operators that have more extreme positions. The amber line is not a regression line, but illustrates where 20 EUR of ARPU is earned. Operators above the line earn more – and operators below the line less than 20 EUR.

Most mature markets operators operate with an APRU of around 20 EUR. Many operators in maturing markets clutter in the southwest or south parts of the chart.

The ARPU vs. usage chart

One could criticise the previous chart for comparing the number of gigabytes with something that relates to it – the revenue per gigabyte. Our next chart, Figure 21, is therefore comparing the number of gigabytes with the revenue per subscription, i.e. the ARPU. And that is perhaps even more interesting.

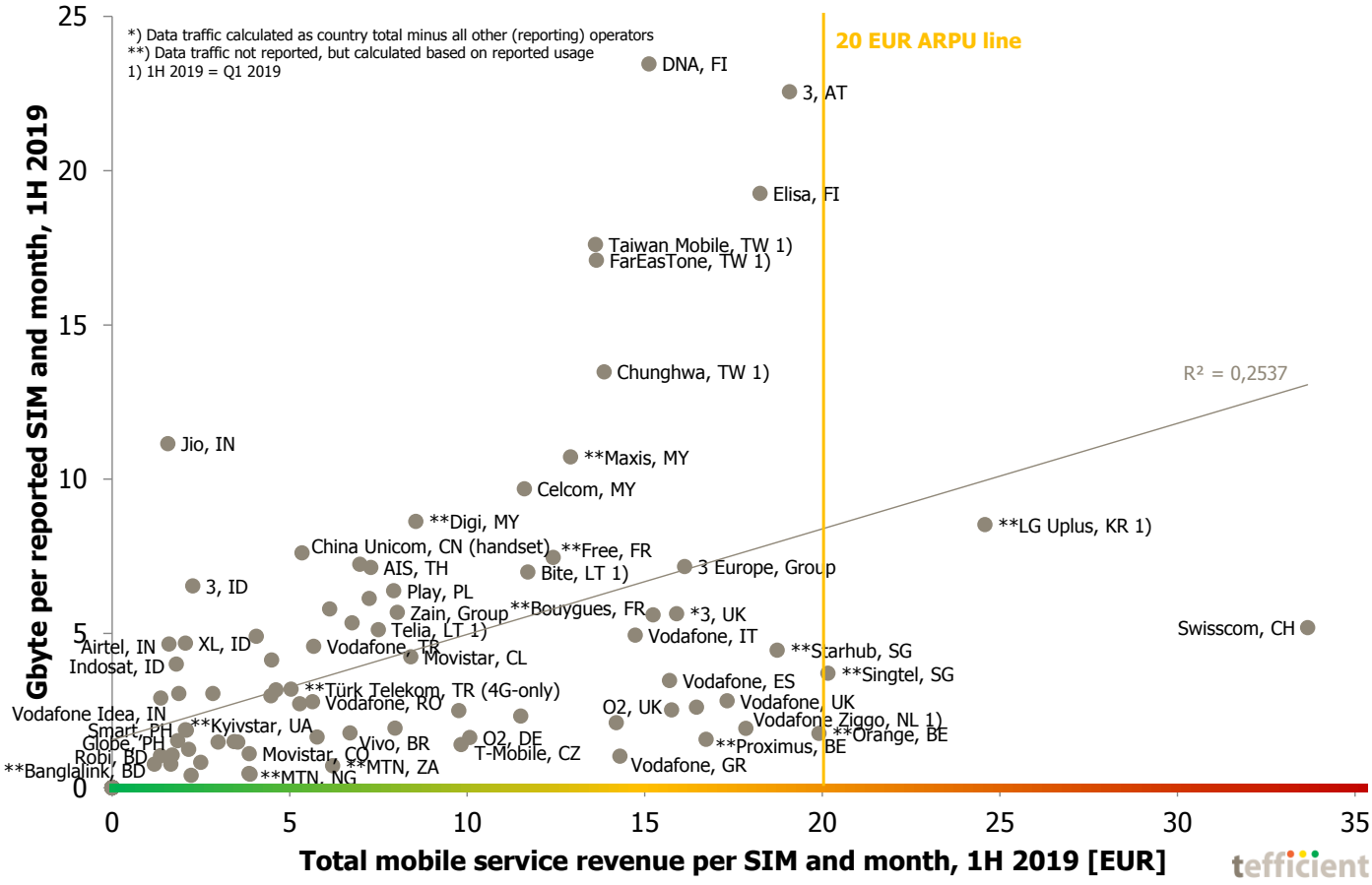


Figure 21. Mobile data usage vs. total mobile service revenue per SIM

Of all the operators there are two[20] – **Swisscom** and **LG Uplus** – that enjoy much higher total mobile service revenue per SIM than all other operators. In the case of LG Uplus the data consumption is also high. Swisscom's subscribers – although many are on speed-tiered unlimited plans – are not using particularly much data, but the ARPU is unparalleled in this group of reporting operators.

In the middle top of the graph there is a cluster of operators with very high average data usage but moderate ARPU of about 15-20 EUR. Here we find the **Finnish** and the **Taiwanese** operators together with **Drei** (3) Austria.

[20] Of the operators that have reported data usage and mobile service revenue in 1H 2019

And then there's **Jio**. Its ARPU isn't the lowest, but considering an average data usage above 11 GB per month, Jio is the clear affordability leader of the world.

The grey regression line suggests that **operators with higher data usage have higher ARPU**.

To moderate this, one has to realise that the adherence to this line (shown by a R^2 value below 1) isn't perfect. And we should also remember that the line visualises an international – not a national – trend: It is quite difficult to find national examples showing that operators with higher data usage enjoy higher ARPU. If anything, it's rather the opposite. It's typically the challenger operator that has the customers with the highest data usage and challenger operators tend to have lower ARPU than incumbents.

Operators with higher data usage tend to have higher ARPU

Dressing the Christmas tree

Absolute ARPU aside, how many of the operators have been able to deliver on "**more for more**" i.e. been able to increase ARPU while increasing data usage? And how many are just following the "more for less" stream, giving users more data but not being able to charge anything more?

This might not be the prettiest Christmas tree you've seen, but it is at least well balanced this time: When data usage increased, **53% of operators could grow ARPU** (with branches growing to the right) – 47% could not.

Data usage grew for 100% of operators

ARPU grew for 53% of operators

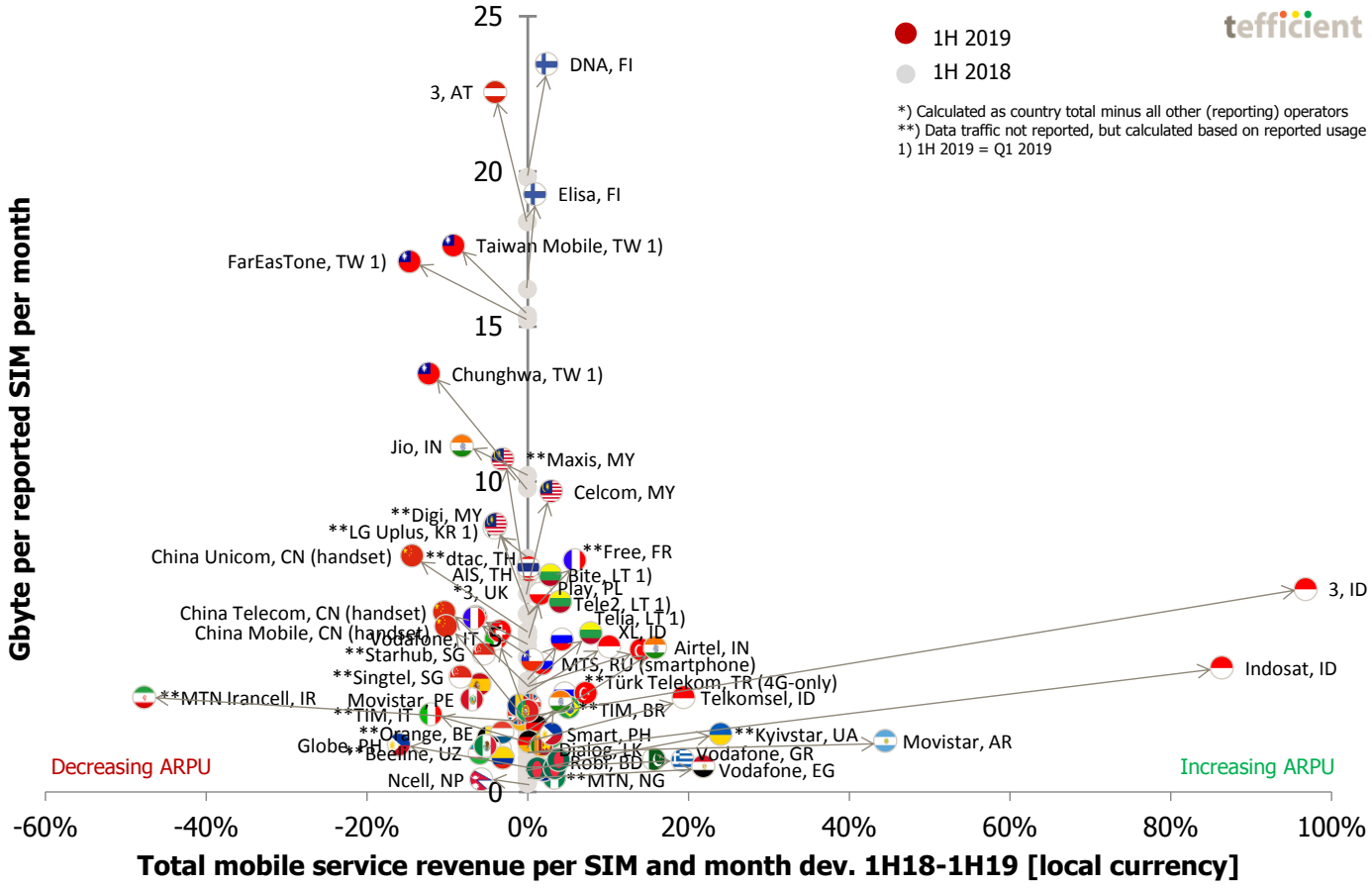


Figure 22. Mobile data usage development vs. ARPU[21] development – 1H 2018 to 1H 2019

Let's highlight a few best practices of successful "more for more" operators:

[21] ARPU is calculated as the reported total mobile service (non-equipment) revenue incl. interconnect & roaming divided with the average number of reported SIMs. It can differ from the definition of operator reported ARPU.

- The Finnish operators **DNA** and, to a lesser extent, **Elisa** have been able to grow ARPU thanks to more and more customers upgrading to faster (and more expensive) speed tiers on their unlimited plans.
- **Celcom** in Malaysia managed to turn the usage growth into ARPU growth when the two local competitors Maxis and Digi could not.
- **Free** in France isn't growing its total mobile base any longer – but are gradually increasing the share of customers who subscribe to their premium unlimited 4G[22] plans, thereby lifting ARPU. Local competitor Bouygues is also growing its data usage, but with a falling ARPU.
- All three **Lithuanian** operators Tele2, Telia and Bite could once again turn usage growth into ARPU growth.
- India's **Airtel** experienced the most disruptive entrant ever, Jio, but has now managed to turn the expansion in mobile data usage into APRU growth. Airtel has fared much better than its competitor Vodafone Idea even though also Vodafone Idea also had a bit of ARPU growth. Note that Jio's ARPU is now in decline.
- **3** and **Indosat** in Indonesia had a massive ARPU expansion but the main reason is the mandatory SIM registration in Indonesia in 2018 that halved the subscription bases of the two operators. In spite of this, 3 and Indosat could still grow revenue y-o-y which suggests that most of these disconnected non-registered SIMs were not generating much revenue.

47% of the operators are on the branches facing left. They had data usage growth, but anyhow a **decline in ARPU**. There are a few operators standing out quite negatively here:

- **Taiwan** where the three incumbent mobile operators FarEasTone, Taiwan Mobile and Chunghwa all continued to experience decreasing ARPU in spite of growing data usage y-o-y. The increase in data usage has though slowed lately as described in the special analysis in the usage part of this analysis.
- India's **Jio** has not seen that much growth in data usage (it was already high) but for the first time we see that Jio's ARPU is falling as the company gains subscriptions at the expense of particularly Vodafone Idea.
- All the three Chinese operators – **China Mobile**, **China Unicom** and **China Telecom** – have experienced massive growth in data usage while ARPU has been falling 10% or more.
- Finally **MTN Irancell** where data usage grew but ARPU collapsed when further sanctions worsened the country's financial crisis.

The fact that more than half (53%) of the operators still managed to turn data usage growth into APRU growth is an **improvement** compared to our Christmas tree graphs is our previous analyses – in which a minority could grow ARPU.

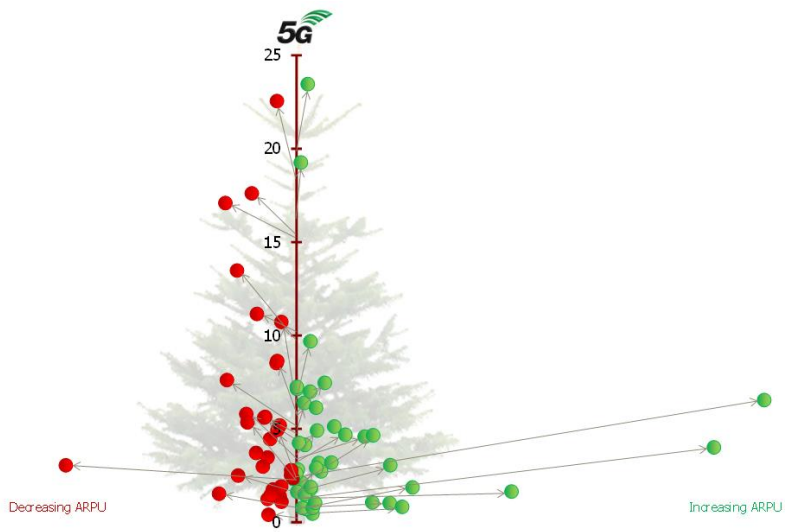
[22] Unlimited in conjunction with a Freebox (triple-play) subscription – otherwise limited to 50 or 100 GB

Conclusion

In this analysis, we have presented fourteen ranking charts and two correlation plots and we hope these are useful for you in understanding how **mobile data usage**, **traffic** and **service revenues** are developing globally.

We find it particularly interesting that it's the operators associated with **unlimited** that now see the first signs of **saturation** in mobile data usage. In **Taiwan**, mobile data usage even plateaued. Maybe the current 4G-based use cases don't offer that much usage upside when the bucket and policy limitations of mobile data gradually are being removed?

Good then that traffic figures from the world's premier 5G market, **South Korea**, suggest that **5G is the start of a new growth curve** in usage.



Our Christmas tree graph shows that data usage grows for *all* operators – and that more than half of these operators have been able to turn that into ARPU growth. 53% might not sound impressive, but it's actually never been higher. These operators have delivered on a "more for more" promise. They have proven their capability to monetise an increasing mobile data usage.

How do you do that? Well, there are **many initiatives** tried out – unlimited, zero-rating, rollover, speed tiers, video tiers, priority tiers, inclusive content, FMC, all-digital brands – and, of course, 5G. We can help you to understand what works.