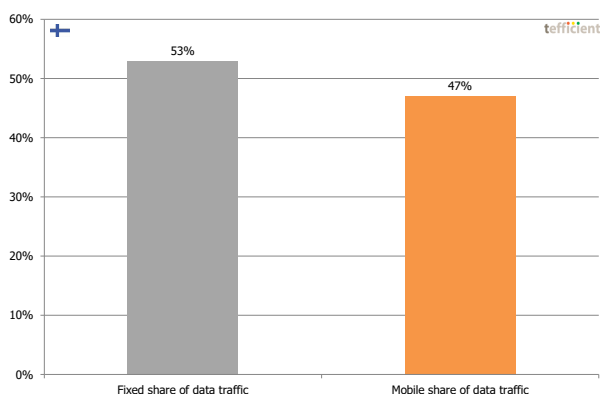


## Industry analysis #3 2021

### Mobile data – first half 2021 (27 Jan 2022 update)

## Back to normal? Or will 5G push the envelope?



Tefficient's 32<sup>nd</sup> public analysis of the development and drivers of mobile data compares 46 countries – now with Brazil added – from all regions of the world.

In our previous, full year 2020, report we could see that the pandemic drove mobile data usage – contrary to the belief that all that time we spent at home would offload mobile data traffic to Wi-Fi and fixed broadband.

Although the pandemic was still very much present in our daily life, the relaxation of restrictions in the first half of 2021 led to a more normal growth in mobile data usage.

It wasn't the best timing, but the mobile industry introduced and marketed a new generation of technology, 5G, in the midst of a pandemic. The impact of 5G on mobile data usage could be positive – especially when operators use 5G as a catalyst to reconsider and loosen previous strict policies.

Finland, Taiwan, Bahrain and Latvia continue to lead the world in average data usage per subscription. The fastest growth was in Peru with 53% – far from the 111% growth that Croatia led with in 2020. Quite a few countries – Iceland, Qatar, Bahrain, Austria, France and South Korea – experienced unusually slow growth rates of 20% or less in the first half of 2021.

Data-only continues to define the average mobile data usage although the share of base is limited. Even more so than before; the pandemic lifted the demand for data-only and it was sustained in the first half of 2021.

Using mobile data has never been cheaper but the erosion in the revenue per gigabyte slowed compared to 2020. Spain had the fastest erosion, 37%, and India the slowest; 9%.

How did ARPU then develop? To answer that, we present an updated Christmas tree graph. And we show how 5G helped South Korea's and China's operators to move from the wrong to the right side of the Christmas tree.

## Data usage is still growing in every single country – except Iceland

Figure 1 shows the development of mobile data usage for 46 countries where regulators<sup>1</sup> report mobile data traffic. The usage is shown per SIM per month – and in Figure 1 we are including all<sup>2</sup> SIMs, also M2M/IoT SIMs.

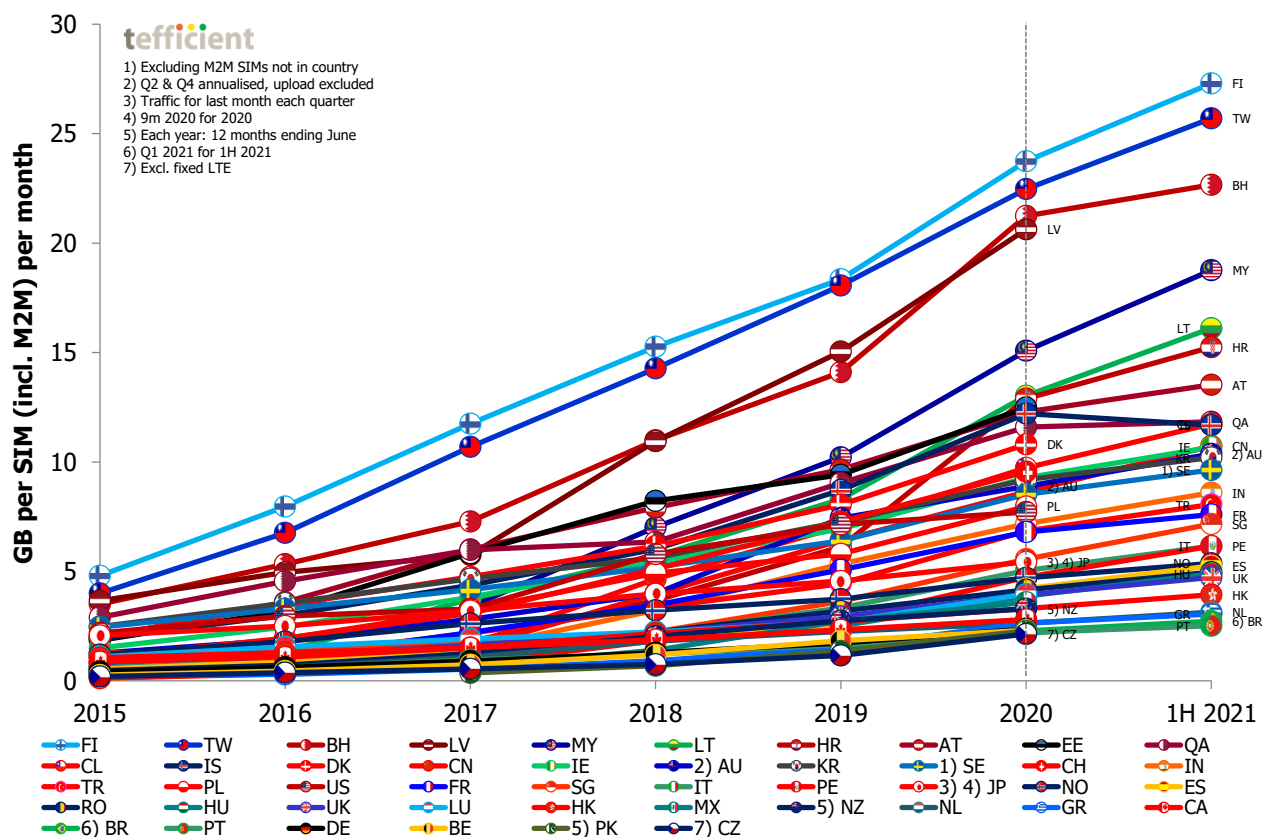


Figure 1. Development of mobile data usage per SIM (incl. M2M) per month – the legend shows the ranking<sup>3</sup>

Starting from the top of the chart, **Finland** and **Taiwan** are defending the number one and two positions in the world when it comes to mobile data usage. The average Finnish SIM card carried 27.3 GB of data per month in 1H 2021. **67%** of the Finnish SIMs (M2M included) had **unlimited data volume** in June 2021. If excluding M2M, 80%. If excluding also voice-only SIMs, 86%. No other country is as unlimited as Finland.

The average Taiwanese SIM carried 25.7 GB per month. Unlimited is behind **Taiwan's** usage development as well. The Taiwanese operators – there are five MNOs – have tried to cool off the market by attempting to move the unlimited price points upwards while discontinuing unlimited for customers that have run out of

<sup>1</sup> Exception: USA, where the data is from the industry body CTIA

<sup>2</sup> All SIMs in a market included; even the SIMs that used no or little data. We think it provides a better comparison than usage per 'mobile broadband subscription' even if it lowers the average mobile data usage numbers somewhat.

<sup>3</sup> Japan, Iceland and Mexico have not yet reported 1H 2021. Denmark will for some reason not report 1H 2021 statistics although its regular frequency is half-yearly. Brazil has to date just reported figures for Q1 2021.

binding. It worked so-so, but the relatively late (mid-2020) introduction of 5G provided the Taiwanese operators with the tool they needed to turn the ARPU erosion curves around. Unlimited is still very much a standard, but with 5G it comes with a tiered premium.

**Bahrain** (22.7 GB) had quite slow growth in 1H 2021 and **Latvia** (20.6 GB in 2020) might well have overtaken Bahrain – but the Latvian regulator only reports numbers once a year. **Malaysia**’s usage increased to 18.8 GB and Malaysia easily defends its number 5 position.

#### ***The M2M reporting dilemma***

Regulators’ reporting of M2M/IoT SIMs continues to create a challenge for the comparability between countries. A growing problem is international M2M SIMs that are registered in one country but used somewhere else. Sweden is a good example. The country regulator, PTS, reports 18.2 million M2M SIMs – a figure that more than doubles the total SIM base if added to the regular SIM base of 14.3 million. We are therefore happy that PTS now reports the number M2M SIMs that are active in Sweden; 4.2 million, i.e. just 23% of the total M2M base. This has allowed us to recalculate a more representative mobile data usage figure for Sweden when including M2M.

The same issue emerges in Austria where Deutsche Telekom group registers many of its international M2M SIMs. The number of ‘Austrian’ M2M SIMs as reported by RTR grew 35% in the year to June 2021 – to 7.4 million. Similar to how it was for Sweden previously, Austria’s average mobile data usage per SIM thus looks lower when including M2M SIMs than what it realistically is. Luckily Austria’s regulator is one of those breaking out M2M SIMs in its reporting allowing a like-for-like comparison of mobile data usage per *non-M2M* SIM, see Figure 2 and Figure 4.

While on the M2M topic, we need to comment on **Iceland**, the only country in Figure 1 where the average data usage per SIM decreased from 2020 to 1H 2021. This is solely attributable to an enormous growth in M2M SIMs: According to the regulator Fjarskiptastofa’s statistics, the Icelandic M2M base grew *5 times* between June 2020 and June 2021. As we will see now, if excluding M2M, the data usage in Iceland grew.

Figure 2 is a variant of Figure 1 but with M2M SIMs *excluded*. As the M2M SIMs typically carry significantly less traffic than the regular SIMs, this makes the usage figures look higher.

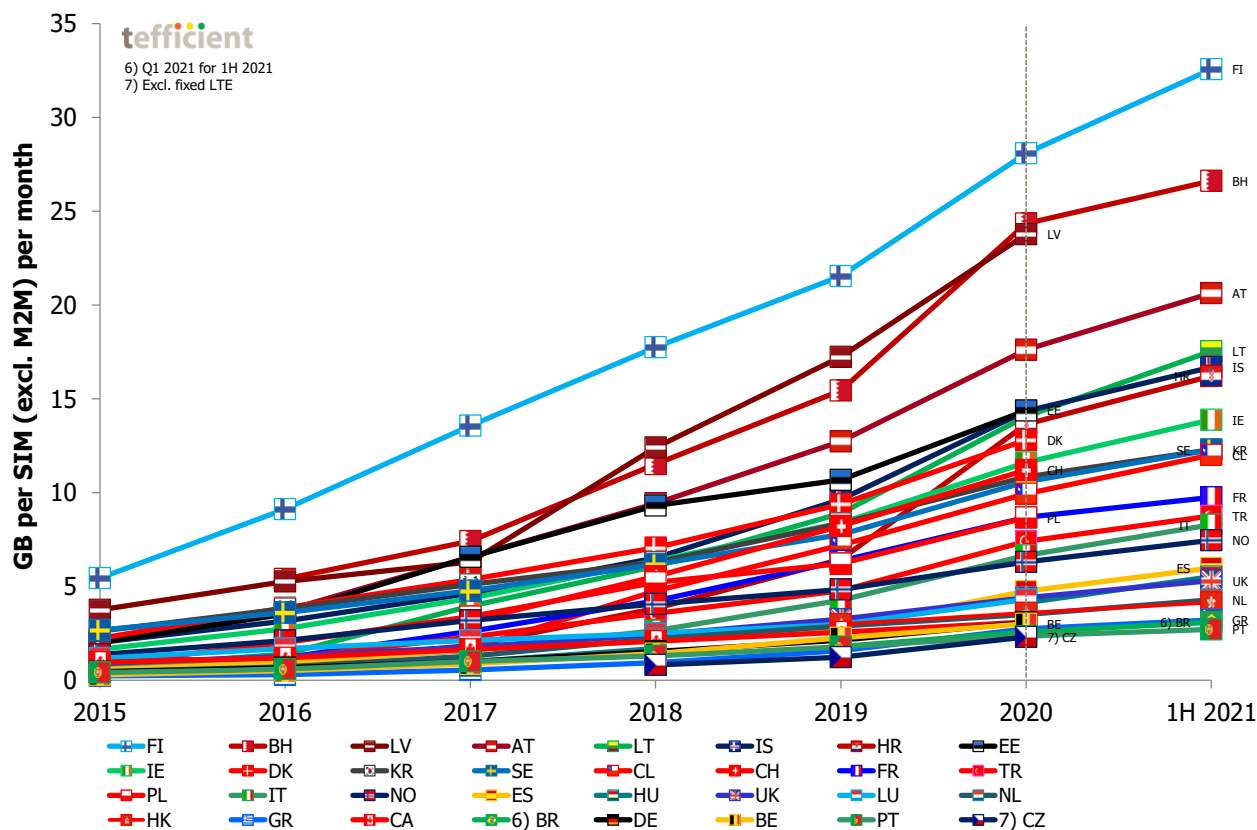


Figure 2. Development of mobile data usage per SIM (excl. M2M) per month – the legend shows the ranking<sup>4</sup>

Since only a fraction of the countries separate out the data traffic associated with M2M SIMs in their reporting (kudos to Norway, Sweden, Czech, Bahrain and Greece), the assumption for most of the countries in Figure 2 is that the M2M data usage is zero. This is of course not correct and as we could expect M2M/IoT SIMs to carry more traffic in future, we think that Figure 1 provides the most accurate comparison.

With **32.6 GB** per non-M2M SIM per month, **Finland** tops also Figure 2. **Bahrain** follows with 26.6 GB and **Latvia** with 23.8 GB (for 2020). Taiwan and Malaysia have disappeared from the top five here as the M2M SIM number isn't broken out in these countries.

The legends of Figure 1 and Figure 2 show the ranking of the 46 studied countries. But since it's difficult to spot them all, Figure 3 and 4 offer an easier visualisation. First including M2M:

<sup>4</sup> Countries for which the regulator doesn't break out the M2M SIMs have been excluded

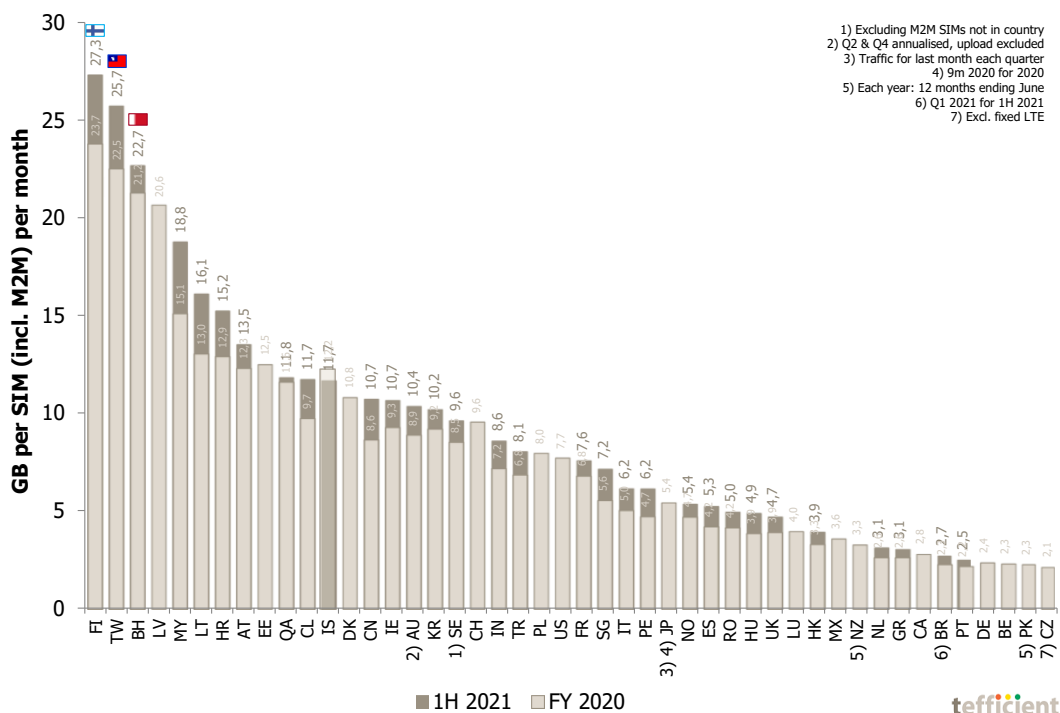


Figure 3. Mobile data usage per SIM (incl. M2M) per month, 1H 2021 and FY 2020

And in Figure 4 excluding M2M:

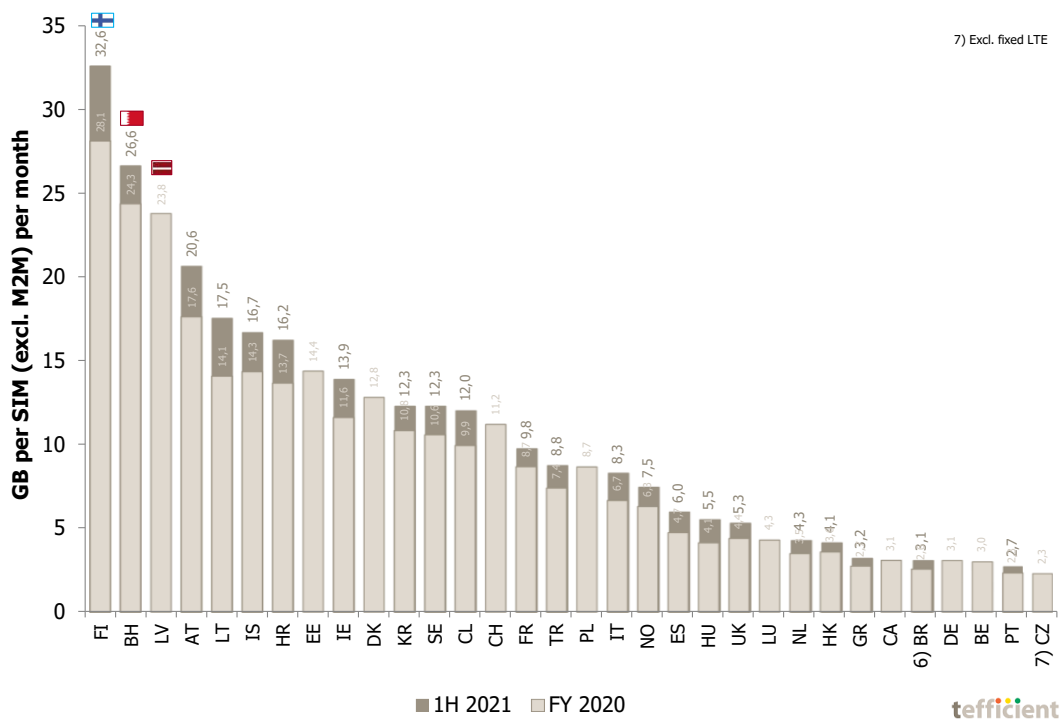


Figure 4. Mobile data usage per SIM (excl. M2M) per month, 1H 2021 and FY 2020

The countries with the lowest data usage in both Figure 3 and Figure 4 are **Czech Republic<sup>5</sup>, Pakistan, Portugal, Belgium, Germany, Brazil and Canada.**

Figure 5 is a zoom-in on the lower end of Figure 1.

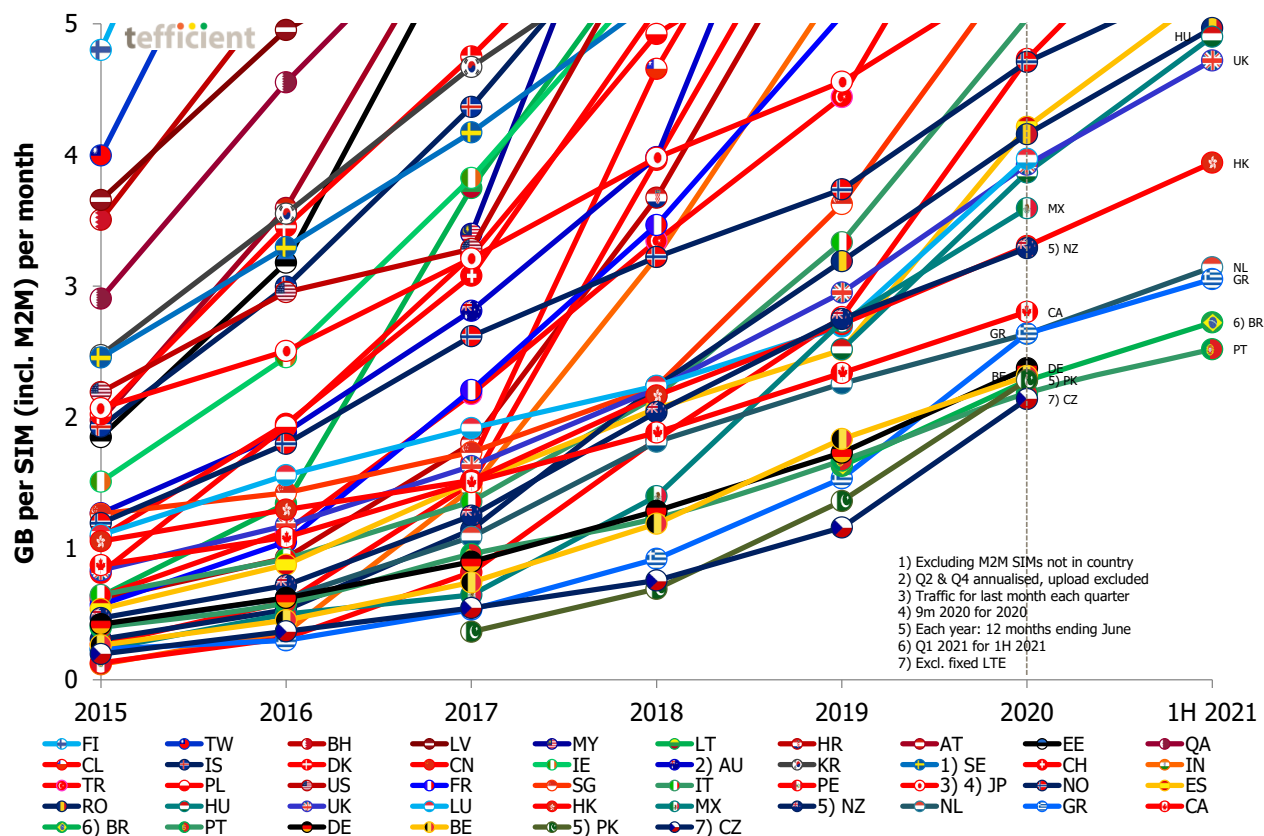


Figure 5. Development of mobile data usage per SIM (incl. M2M) per month [zoom-in on low end]

Albeit in the lower usage range, **Portugal, Brazil, Greece, the Netherlands, Hong Kong and the UK** had quite modest year-on-year usage growth (24-34%) in 1H 2021.

<sup>5</sup> Note that the fixed LTE traffic is excluded in the reported mobile data traffic of the regulator CTU. To make it comparable with other markets, we could have added it, if only CTU reported it.

## Data usage growth fastest in Peru

Figure 6 shows the growth in average usage per SIM (incl. M2M) between 1H 2020 and 1H 2021.

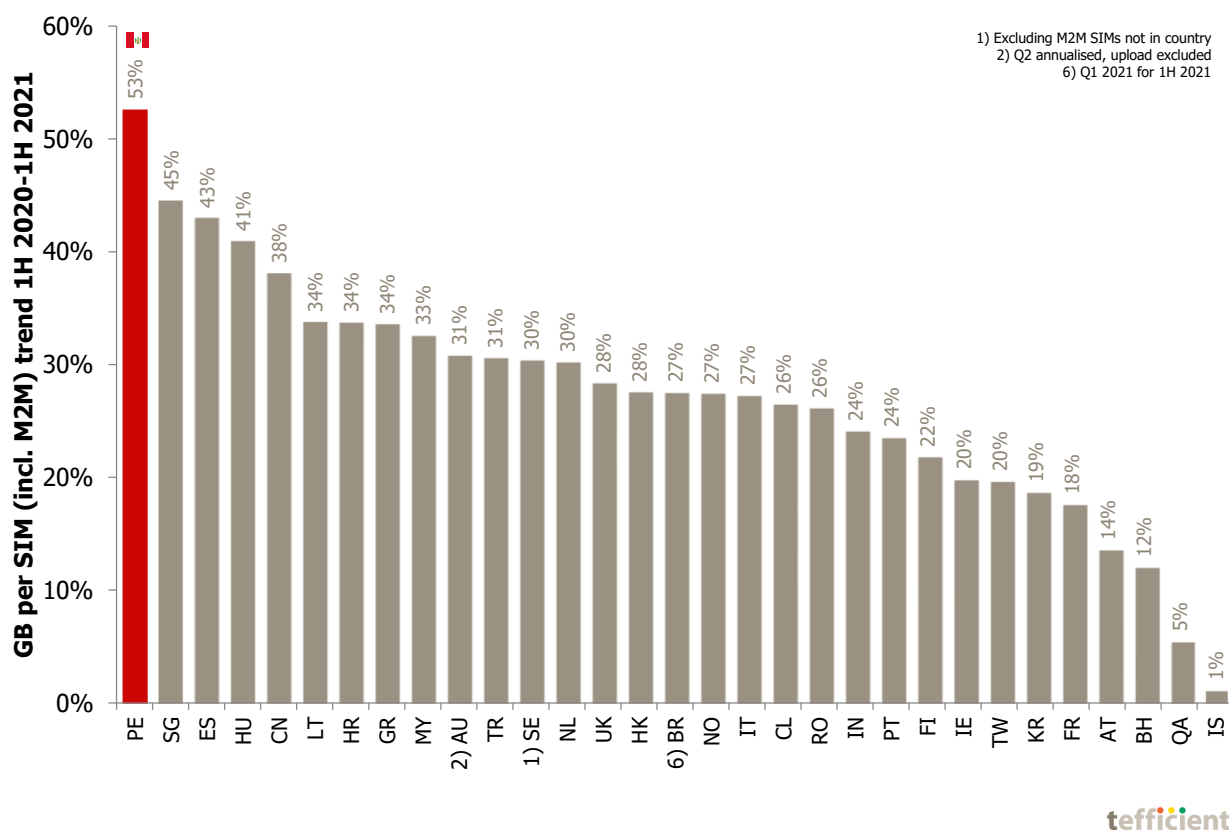


Figure 6. Development of mobile data usage per SIM 1H 2020-1H 2021

**Peru** outpaced the other markets in mobile data usage growth. The average Peruvian SIM used 53% more mobile data in the first half of 2021 compared to the first half of 2020. Compared to the 111% that Croatia won with in our [previous report](#) (for 2020), it's quite slow though. The usage in **Singapore** grew 45%, in **Spain** 43% and in **Hungary** 41%.

The growth laggards in Figure 6 are **Iceland** (1% – but then be aware of the growth in M2M SIMs as explained earlier), **Qatar** (6%), its neighbour **Bahrain** (12%) and **Austria** (14%).

Iceland, Qatar, Bahrain and Austria had the slowest usage growth

## Data-only rarely more than 20% of base, but defines usage

Although **fixed wireless access** (FWA) seems to experience a renaissance with 5G, using mobile networks to substitute fixed broadband is hardly something new. In some markets, like Finland and Austria, this has been around for long. The take-up can be significant if the FWA/data-only offers are reasonably charged and without usage caps. It also helps if the fixed broadband offering is weak with much DSL in the mix.

For the first time, the Finnish regulator, Traficom, reported an estimated split between the mobile data traffic and the fixed data traffic in Finland, see Figure 7.

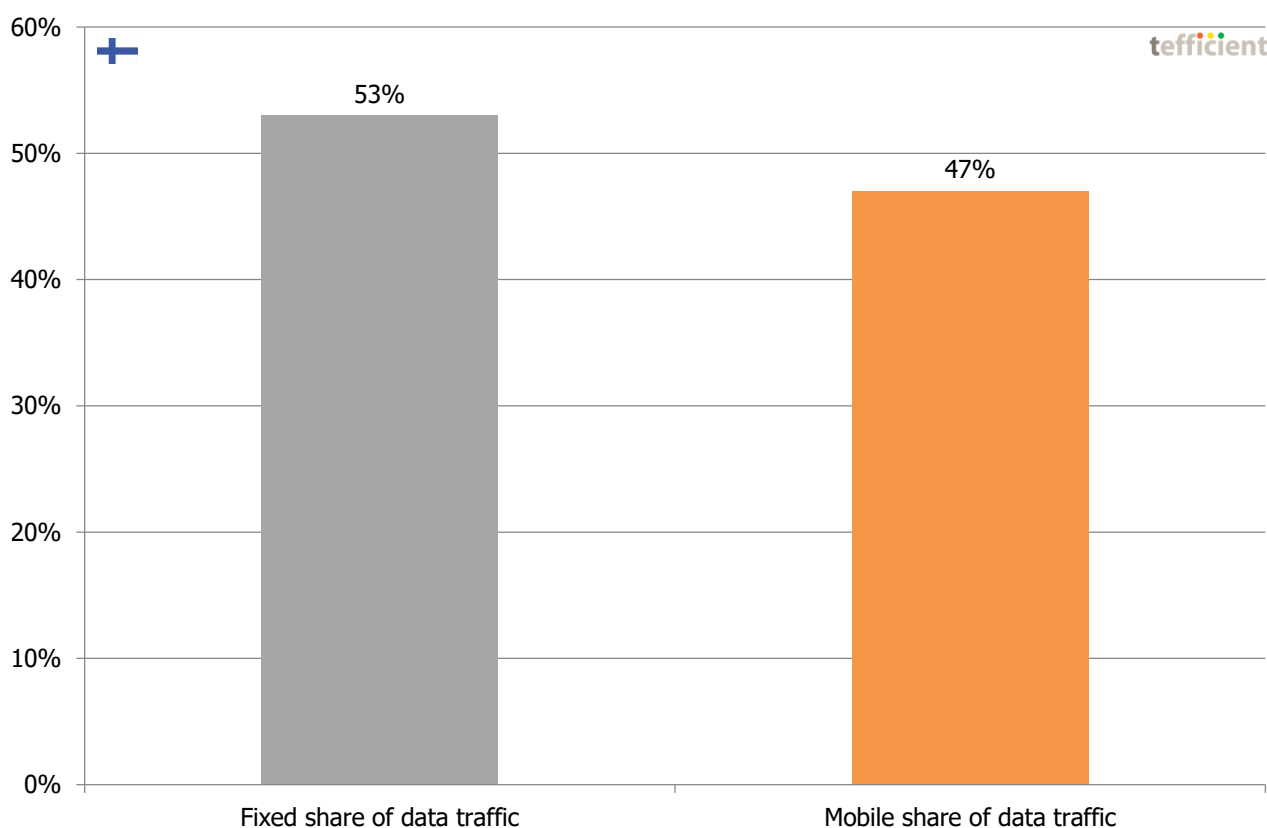


Figure 7. Distribution between fixed and mobile data traffic in Finland, 1H 2021

The mobile data traffic represented **47%** of the total data traffic in Finland in 1H 2021. Although Traficom emphasises that it is an estimate, it's likely the most even distribution between fixed and mobile networks among our 46 markets. Austria, in comparison, had 64% of the traffic over fixed vs. **36%** over mobile in 1H 2021.

This takes us to Figure 8. It plots the average data usage per SIM vs. the data-only share of a country's SIM base.



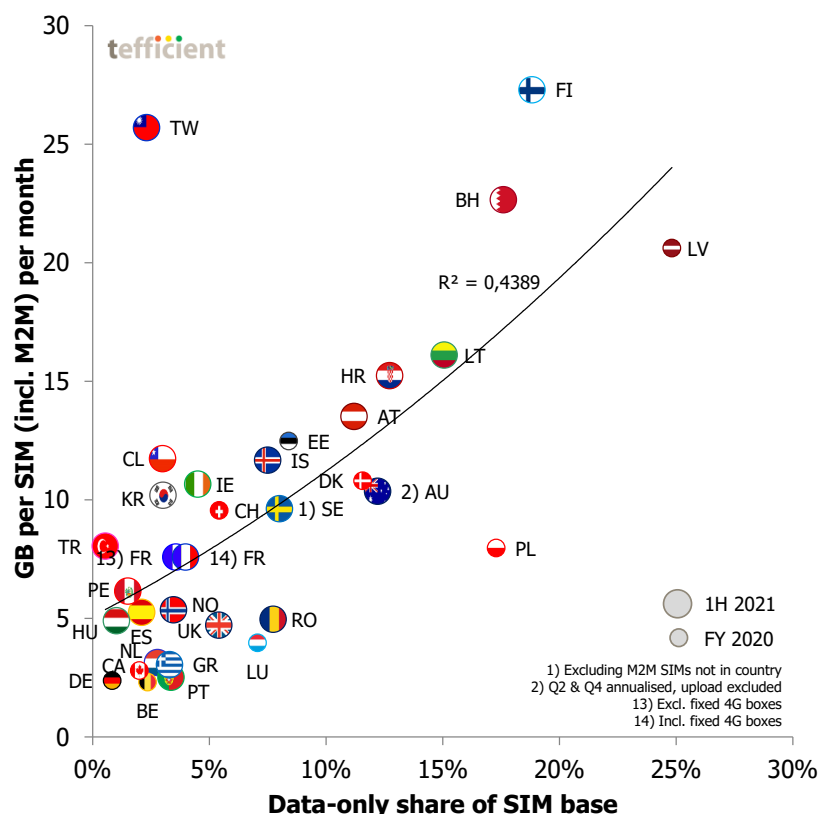


Figure 8. Mobile data usage vs. data-only share

In December 2020, **25%** of the SIM base in Latvia was data-only. That makes **Latvia** the leader in data-only share of base – and the average mobile data usage was also high. In **Finland** data-only represented 19% of the base but usage was even higher than in Latvia. Also **Bahrain** had a high data-only share – 18%. There are nine countries forming a central cluster between 8% and 17%: Iceland, Sweden, Estonia, Austria, Denmark, Australia, Croatia, Lithuania and Poland.

The adherence to the regression line is relatively strong. As in all previous reports we therefore conclude that **data-only penetration is a significant driver of the average mobile data usage**.

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The easiest way for low-usage countries to grow data usage and expand the mobile market would be to **start addressing and monetising the data-only segment**. This seems to be effective particularly in markets where fast fixed broadband networks (FTTH, FTTB or HFC) aren't already available to a substantial share of the households. The US wireless market leader **Verizon** launched its first **5G** branded service in December 2018 to

support a fixed wireless access (FWA) use case. **T-Mobile** has since followed. Operators such as Optus in Australia, 3 in the UK (above), Sunrise in Switzerland, 3 in Austria, DNA & Elisa in Finland and lately the two

Norwegian operators Telenor & Telia have all followed Verizon into **5G-based FWA**. Figure 8 shows that even a relatively low share of such data-only subscriptions could lift the average data consumption significantly.

Some of the countries in Figure 8 are also reporting the data-only traffic. For these countries, we can compare the data-only penetration of the SIM base to its share of the total mobile data traffic, see Figure 9.

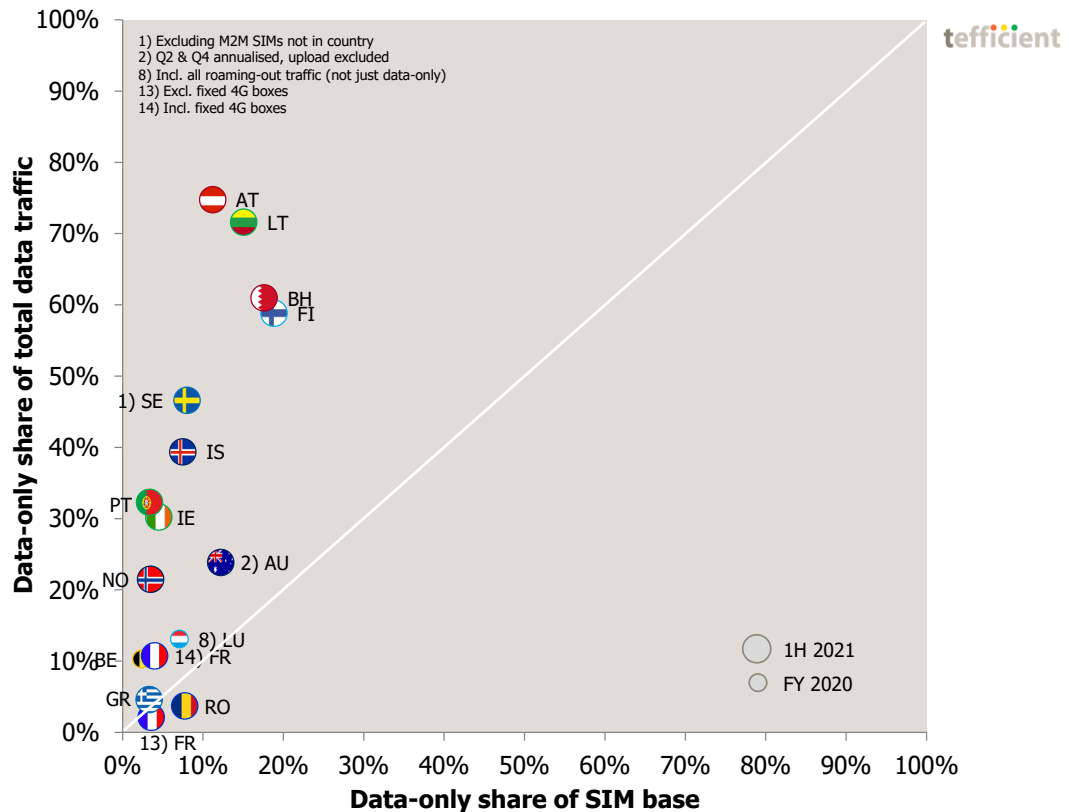


Figure 9. Data-only share of total traffic vs. data-only share of SIM base

With the exception of Romania, data-only SIMs carry a disproportionately high share of the data traffic:

- Portugal **9.6x** higher traffic per data-only SIM vs. any SIM
- Ireland **6.7x**
- Austria **6.7x**
- Norway **6.2x**
- Sweden **5.8x**
- Iceland **5.3x**
- Lithuania **4.8x**
- Belgium **4.4x**
- Bahrain **3.5x**
- Finland **3.1x**

- France (incl. fixed 4G boxes) **2.7x**
- Australia **2.0x**
- Luxembourg **1.9x**
- Greece **1.4x**
- Romania **0.5x**

In addition to the countries in Figure 9, there is one which doesn't report data-only SIM base, but data-only's share of traffic: In **China**, 4% of mobile data traffic wasn't carried over regular mobile phones.

For the countries that are reporting both data-only traffic and the number of data-only subscriptions, we can compare the average usage per *data-only* subscription, see Figure 10.

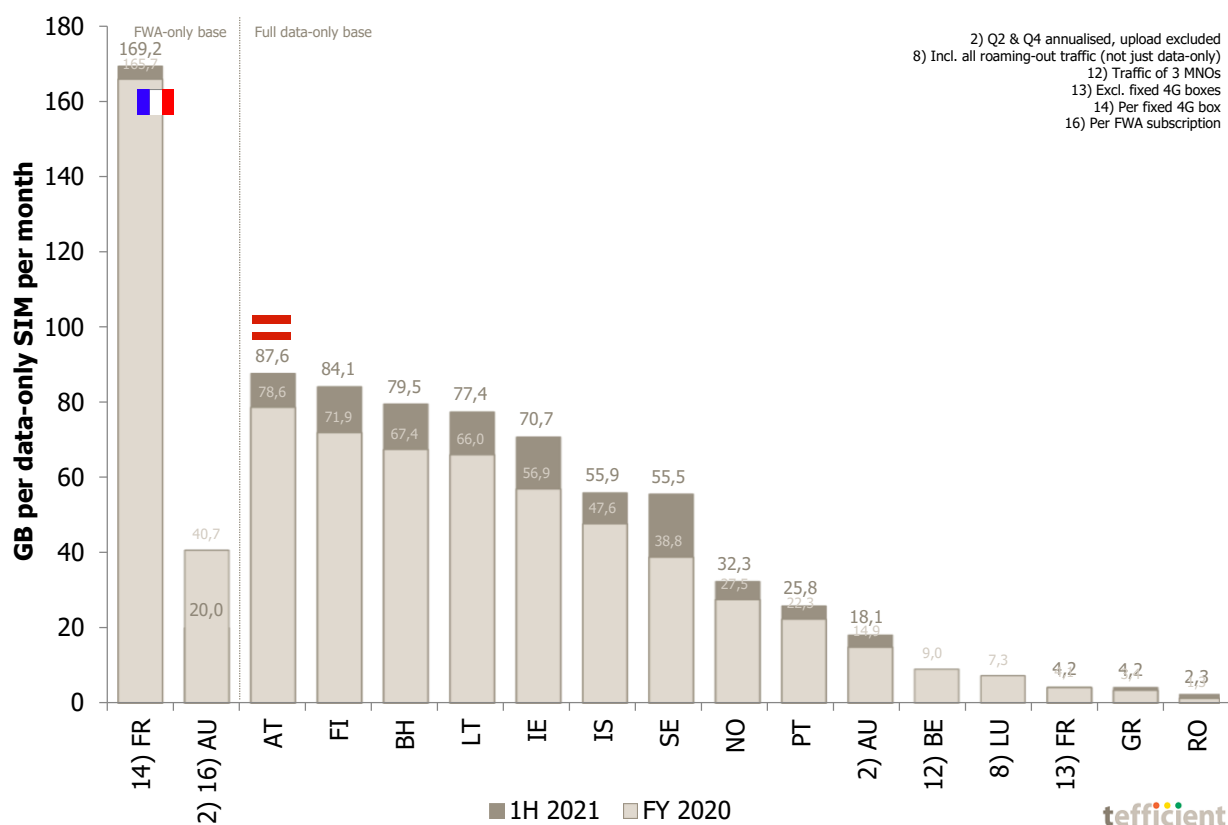


Figure 10. Mobile data usage per data-only SIM per month, 1H 2021 and FY 2020

Starting from the left, the average '4G box' in **France** carried **169.2 GB** of mobile data per month in 1H 2021. This is significantly higher than for the other FWA-only usage number in Figure 10: In Australia, the usage per FWA subscription was just 20 GB in 1H 2021<sup>6</sup>.

<sup>6</sup> There's a major difference in the number of reported FWA subscribers by the regulator, ACCC, and the operators

If instead looking at the *whole* data-only base (not just the FWA segment), **Austria** leads with the average mobile data consumption per data-only SIM of **87.6 GB**. **Finland** had 84.1 GB. **Bahrain** follows with 79.5 with **Lithuania** just behind with 77.4 GB.

If **5G** should become the fibre-over-radio solution that e.g. Verizon, Sunrise and others suggest, the data-only FWA usage figure of France gives a taste of the usage that the solution must at least manage. Fixed broadband usage is yet higher – often around 300 GB per month.

The average Austrian data-only subscription consumed 87.6 GB per month in 1H 2021

The appetite that operators show for FWA seems to make them let go of their **anxiety for unlimited** within the data-only segment. Figure 11 shows something quite interesting.

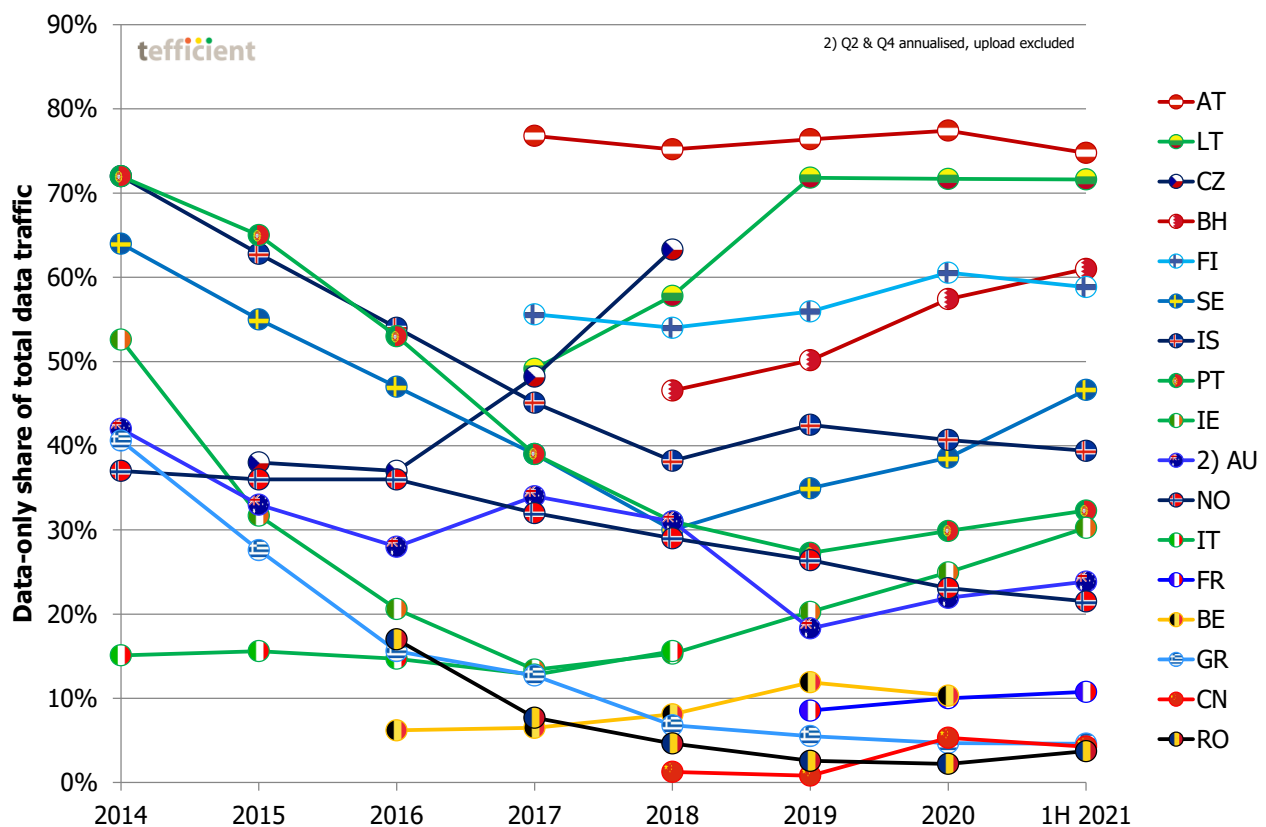


Figure 11. Development in the data-only share of total mobile data traffic – for all reporting countries

Data-only's *share* of traffic decreased until 2018. It's not necessarily that the absolute data-only traffic decreased, but the growth of the smartphone traffic was much quicker. But something happened in 2019 which continued in 2020.

For a number of markets – Austria, Finland, Bahrain, Sweden, Portugal, Ireland, Australia, France and China – **data-only traffic gained market share** in 2020. Some of these continued the trend in 1H 2021. Overall, the trend seems to have turned to a higher share of traffic originating from data-only subscriptions. It's must be because of Corona, right? No; that trend shift happened already in 2019. We instead attribute it to FWA and the wider adoption of unlimited within operators' data-only propositions.

Data-only's share  
of total traffic  
started to grow  
again in many  
markets

## 4G adoption a weakening driver of data usage – 5G a different story

Ever since Tefficient started to publish these mobile data analyses back in 2013, we have checked mobile data usage against the 4G adoption. With the growing adoption of 4G, that correlation weakened. Unlike data-only, 4G adoption is no longer defining data usage.

As 5G has been in commercial operation in more than two years by now, it would be more interesting to now correlate mobile data usage with **5G** adoption. Too few regulators (and operators for that sake) are however reporting 5G traffic – and 5G base – to make a sensible correlation graph for 5G. We strongly encourage regulators to see to that 5G numbers are reported.

Figure 12 below gathers all 5G information reported for our 46 markets.

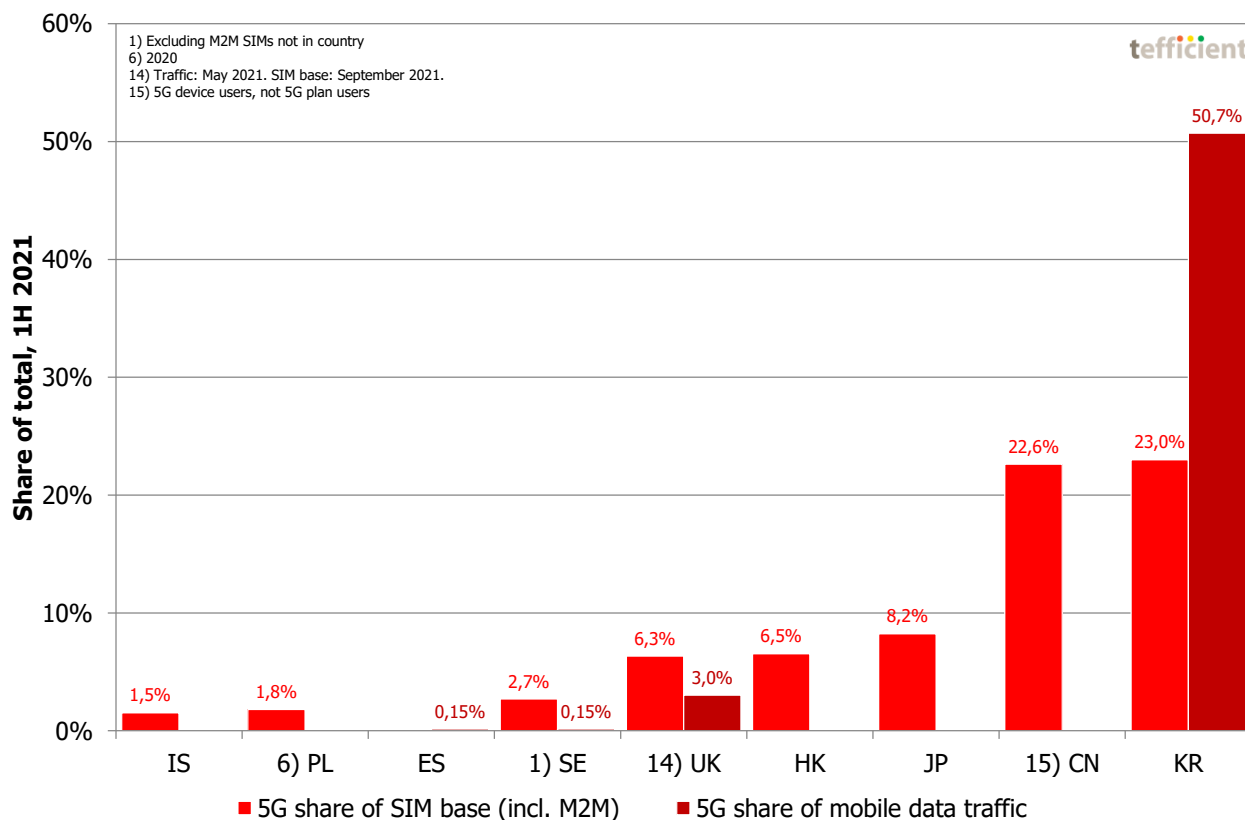


Figure 12. 5G share of base and 5G share of total mobile data traffic – reporting countries

From left in Figure 12: In June 2021, 1.5% of **Iceland**'s mobile subscriptions were 5G. 5G traffic wasn't reported. In **Poland**, 1.8% of the SIM base was 5G in December 2020. **Spain** had 0.15% of its mobile data traffic over 5G networks in 1H 2021. Also **Sweden** had the same 0.15% of traffic – generated by 2.7% of the mobile subscriptions in June 2021. In the month of May 2021, the 5G networks of the **UK** carried 3.0% of the mobile data traffic – and **6.3%** of subscriptions had active 5G devices in September 2021. Hong Kong had **6.5%** of its mobile subscriptions on 5G in June 2021. In June 2021, 8.2% of **Japan**'s mobile subscriptions were 5G.

**China** had 22.6% of its mobile subscribers on 5G devices in June 2021. The number of subscribers on 5G plans was significantly higher, but also the 22.6% value can be somewhat exaggerated as there likely are a few 5G devices on non-5G plans although the non-5G plans in China are higher priced for the same amount of data.

And then there's **South Korea**, the country that was first with commercial, standards-based, 5G in the world: In June 2021, 23.0% of the SIM base in the country was 5G – while 5G carried **50.7% of the traffic** in the first half of 2021. Yes, a majority of the mobile data traffic.

Since the Korean government reports monthly stats on 5G, Figure 13 shows the monthly development for the subscriber and traffic adoption.

South Korea: A majority of mobile data traffic was 5G in the first half of 2021

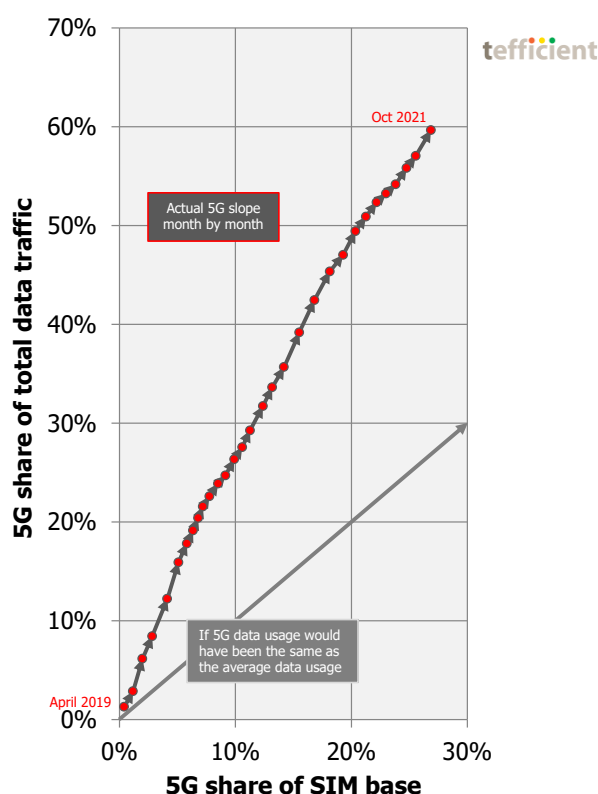


Figure 13. 5G share of total traffic vs. 5G share of SIM base – Korea per month since 5G launch

In October 2021, **59.6%** of the mobile data traffic in South Korea was 5G. 5G represented 26.9% of the total SIM base, indicating that the average mobile data usage per 5G subscriber is far higher than for non-5G subscribers in South Korea. The usage figures for October 2021 are:

- 5G: **26.8** GB per month
- 4G: **9.1** GB per month

It's important to point out that it's not 5G as such that alone explains the higher mobile data usage in 5G: Korea's operators are offering **unlimited** data plans more widely in 5G compared to what they did in 4G. But even if comparing apples to apples – unlimited to unlimited – 5G still seems to drive usage.

In September 2021, the average unlimited 5G subscription generated **39.1 GB** whereas the average unlimited 4G subscription generated 10 GB less – **28.8 GB**.

The development in Korea is impressive and bodes well for the industry. It will be interesting to see if **China** and **Japan** – two other countries where operators have started to report 5G customer numbers – will be able to follow the Korean 'gearing' curve between base and traffic.



## A gigabyte has never been cheaper

Most mobile operators in mature markets aren't attempting to monetise voice and SMS based on usage any longer; they have instead made these allowances unlimited and included them in a flat fee. This means that the last price-defining parameter for most mobile users is **data volume**. Even though more and more operators introduce unlimited propositions, these are often the last step in a tiered data plan<sup>7</sup> – which means that price still, essentially, is about data volume.

Figure 14 plots the *total* mobile service revenue per consumed gigabyte<sup>8</sup> against the average mobile data usage per SIM and month.

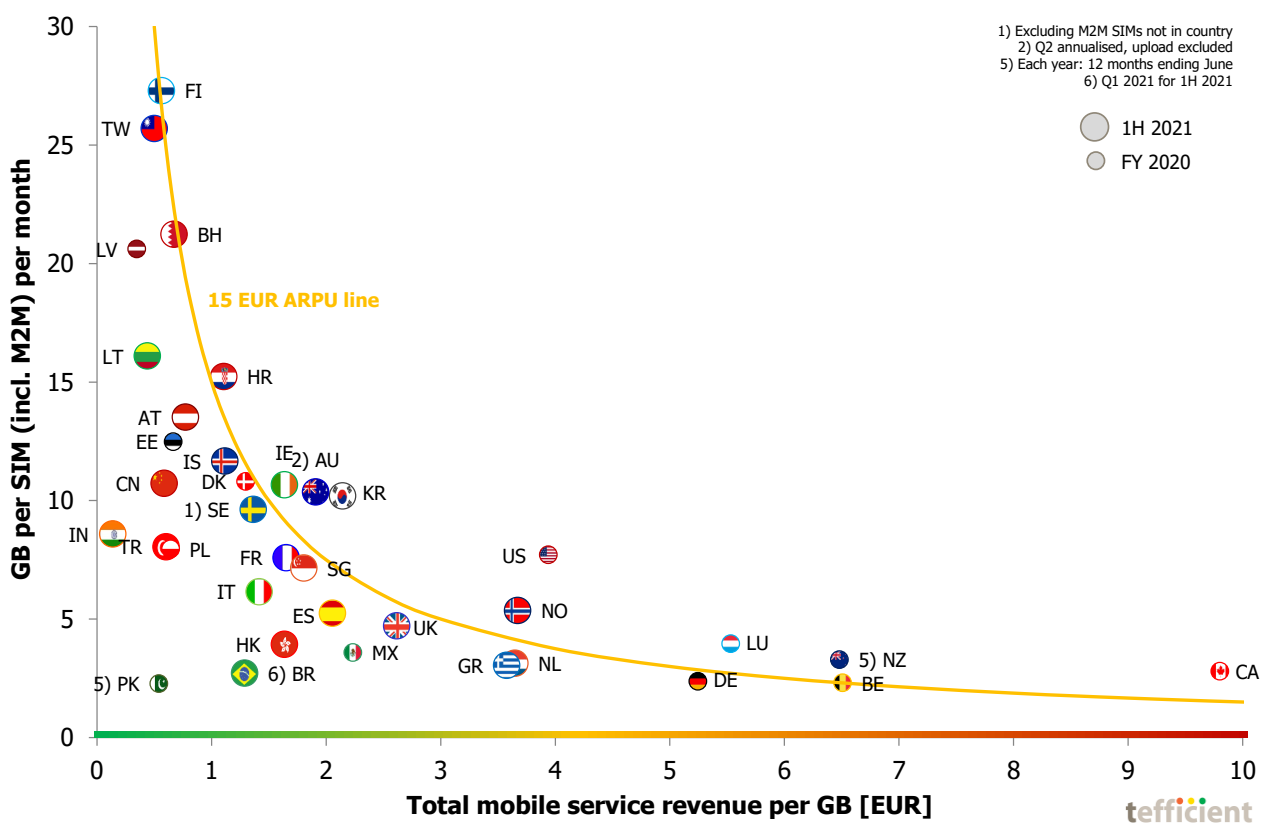


Figure 14. Mobile data usage vs. total mobile service revenue per consumed GB

The amber line shows where **15 EUR of ARPU** is earned. Countries below it had an ARPU lower than 15 EUR; countries above an ARPU higher than 15 EUR.

There are a few countries where operators enjoy very high total revenue per consumed gigabyte: **Canada, Belgium, New Zealand<sup>9</sup>, Luxembourg** and **Germany**.

<sup>7</sup> There are exceptions to this, e.g. Finnish operators, Swisscom, O2 Germany and Vodafone in Spain, the UK and most other European Vodafone markets except Germany, where the price-defining parameter instead is data throughput. There are also operators mixing several parameters such as volume, throughput, policy, zero-rating, video resolution, service bundling etc.

<sup>8</sup> Attributing zero value to voice and messaging

It's important to point out that our analysis looks at what the mobile operator industry *de facto* makes on end-users, not what the best offer on the market currently is. In reality, most users are on old price plans because they are still locked in by a contract – or because they have not bothered to find the best deal.

In the other end of the scale we find the countries where operators get the lowest revenue per consumed gigabyte: **India, Latvia, Lithuania, Taiwan, Pakistan, Finland, China, Turkey, Poland, Estonia** and **Bahrain**.

Looking at Figure 14 we can conclude – as in all our previous analyses on this topic – the key explanation to high mobile data usage is low effective revenue per gigabyte: **Bigger data buckets lead to lower revenue per GB – which, on the other hand, increases usage**. At least when customers can use those big buckets also on data-only devices; see Figure 8.

Indian operators have the lowest total revenue per GB – Canadian operators the highest

But we also said that a gigabyte has never been cheaper. More correctly put is that operators never had lower total service revenue per gigabyte than what they currently have. Figure 15 shows the revenue erosion from 1H 2020 to 1H 2021.

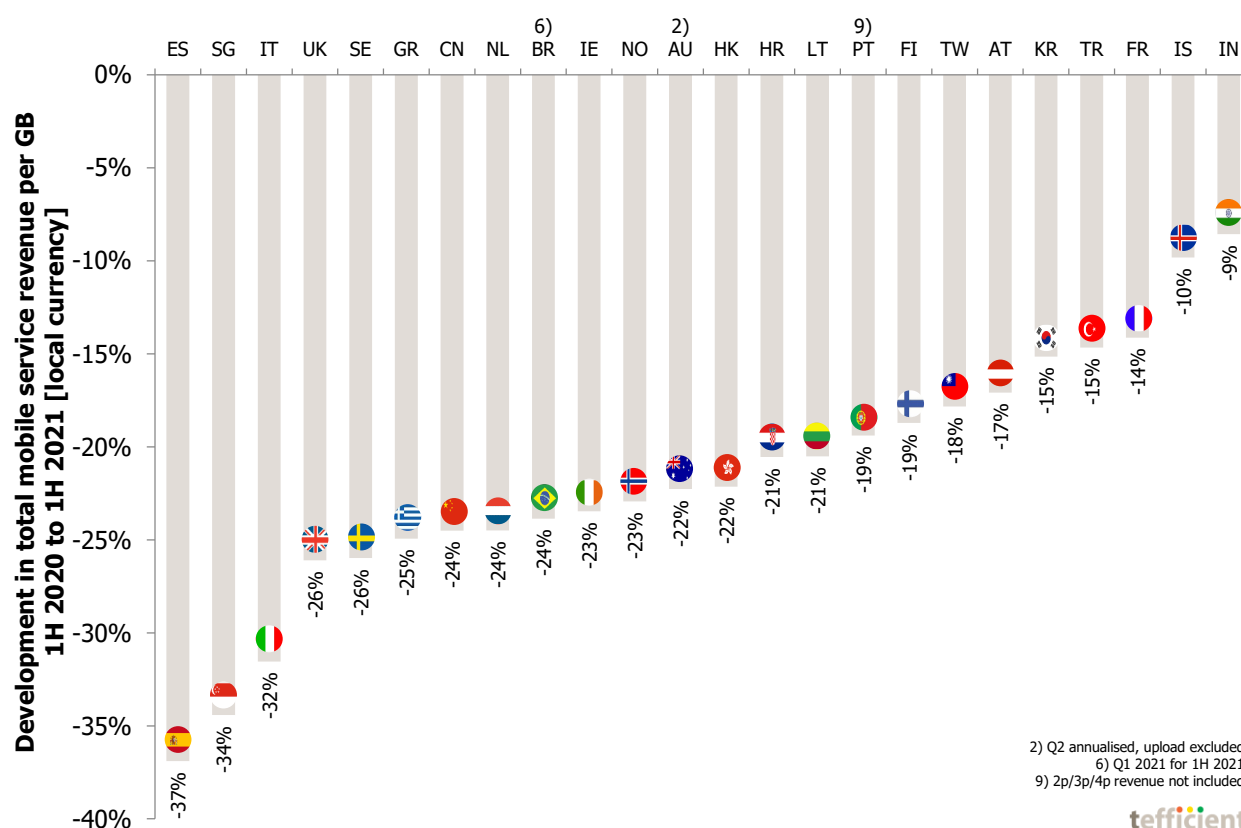


Figure 15. Erosion in total mobile service revenue per consumed GB – 1H 2020 to 1H 2021

<sup>9</sup> Based on latest available (12 months to June 2020) data

The prerequisite to be in Figure 15 is of course that the statistics have been reported both for 1H 2020 and 1H 2021. Of these markets, **Spain** has the fastest revenue erosion, 37%. That is still much slower than what Croatia had in our previous, 2020, report: 53%. **Singapore** is just behind with 34%. **Italy** is third with 32%.

**India**, which historically often had the fastest revenue erosion in our reports, is now having the slowest erosion, 9%. The merger between Vodafone and Idea into Vi seems to have benefited the two market leaders Jio and Airtel while Vi continues to weaken, leading to higher market concentration.

## No correlation between data usage and ARPU

Figure 16 is a variant of the revenue per GB chart – it plots the usage against the average revenue per SIM, i.e. the ARPU.

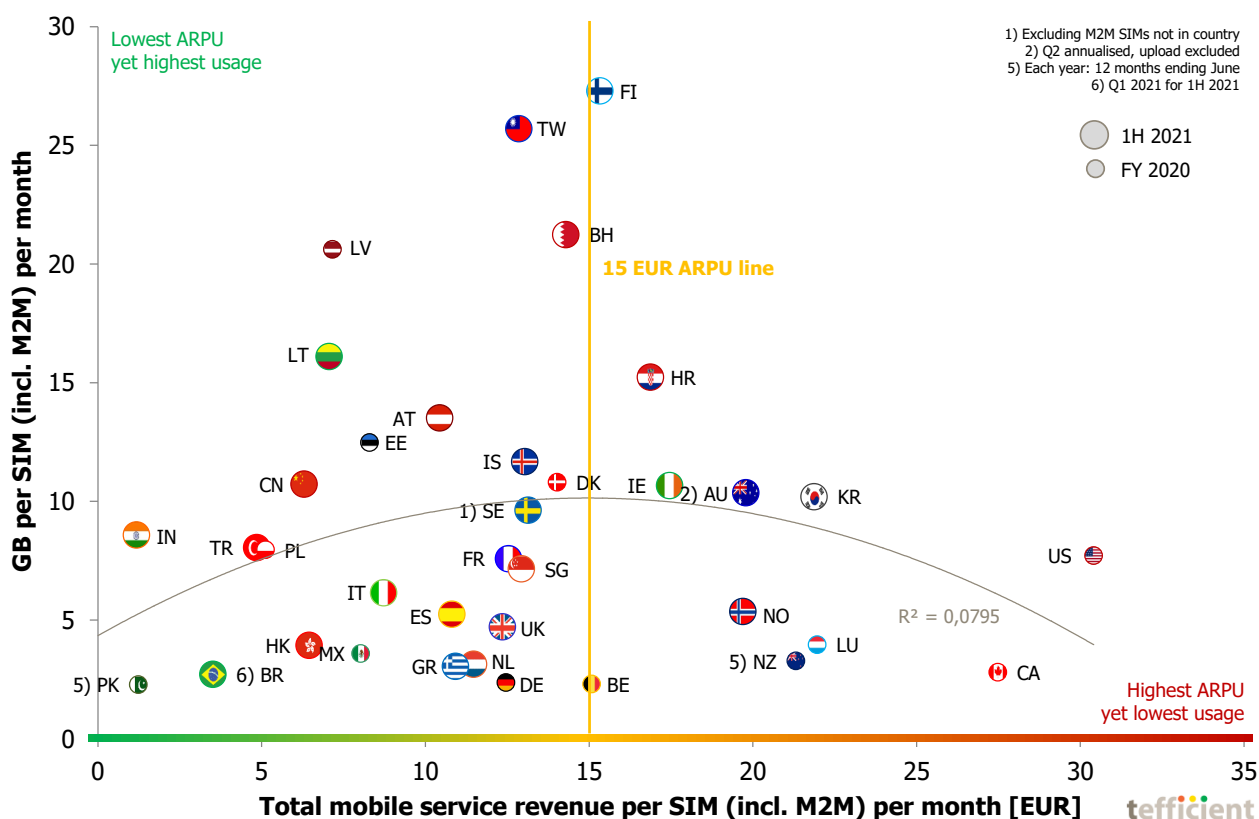


Figure 16. Mobile data usage vs. total mobile service revenue per SIM

Of our markets, there are two<sup>10</sup> where operators derive ARPUs much higher than elsewhere: **USA** and **Canada**. Luxembourg, New Zealand, South Korea, Australia and Norway are also having relatively high ARPU.

In four of these markets – USA, Canada, Luxembourg and New Zealand – regulators are only reporting once a year so the dots are for 2020<sup>11</sup> (like other smaller dots). 1H 2021 data would likely not have changed the outlier position of these markets as we continuously over the years have seen that operators in these markets enjoy high ARPU even though mobile data usage isn't very high.

<sup>10</sup> Switzerland can no longer be shown as Sunrise UPC after the merger no longer reports mobile service revenue – and since BAKOM's revenue reporting does not historically match the sum of the operators and also depicts a very different trend, it is not used here

<sup>11</sup> In New Zealand's case even for the year ending June 2020 (still latest available)

Operators in the upper left corner – **Finland, Taiwan, Latvia, Lithuania, India** and **Pakistan** – are being the most generous with mobile data considering their ARPU. These countries form a nice imaginative trend line suggesting that operators could expect to get rewarded with higher ARPU as usage grows.

But that's regrettably not to overall trend: The adherence to the grey regression line is weak and it's anyhow not pointing in the north-easterly direction one would like to see – with more usage leading to higher ARPU.

## Dressing the Christmas tree based on ARPU development

Now to our Christmas tree graph. It's the graph where we ideally like to see the branches stretch to the right since that means that the ARPU grew in the past year. That would demonstrate that the operators of a country have been able to monetise the growth in data usage.

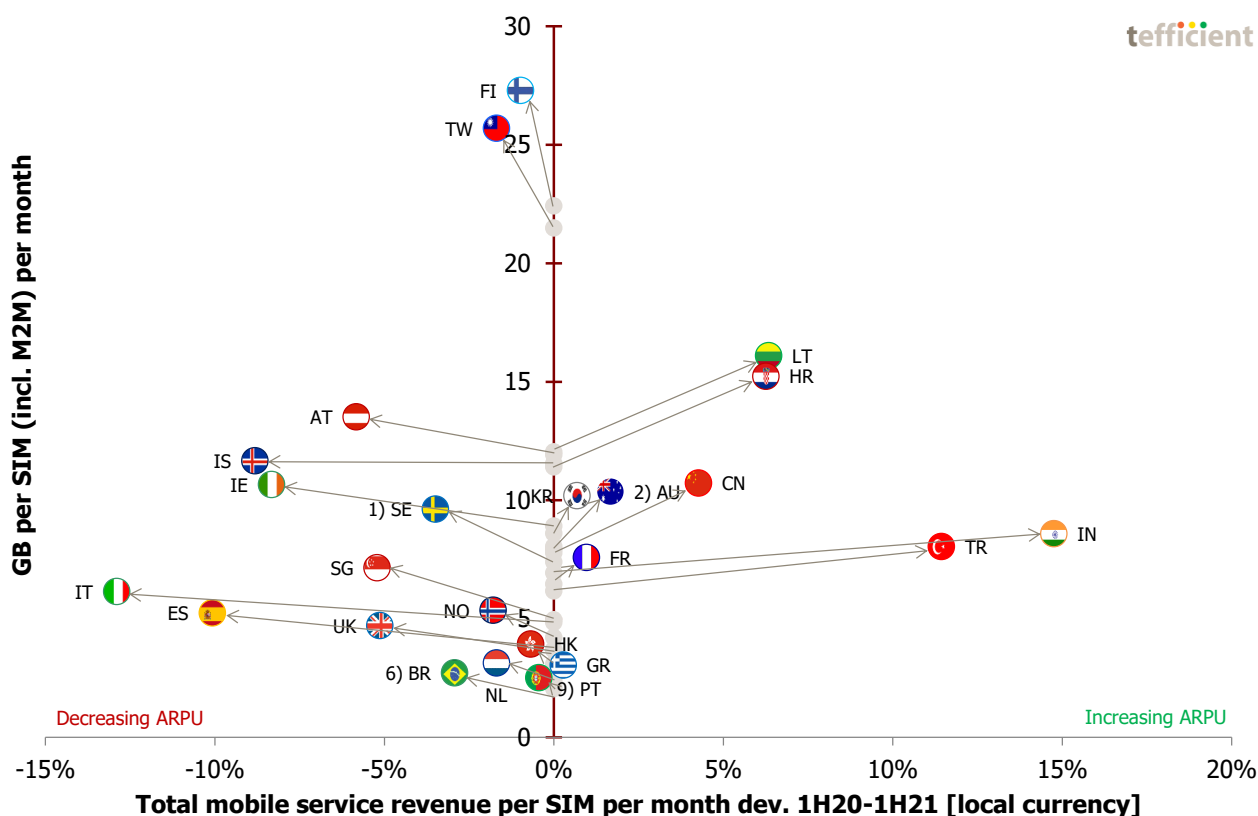
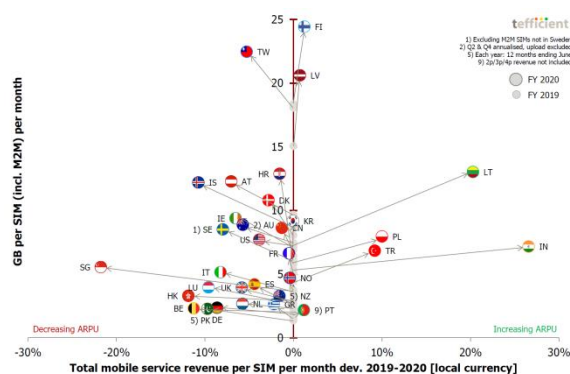


Figure 17. Development in mobile data usage vs. the development in ARPU – 1H 2020 to 1H 2021

In reality the branches stretch right in only **9 of 24 markets**<sup>12</sup> (38%). These nine – from the top – **Lithuania, Croatia, China, Australia, South Korea, India, Turkey, France and Greece**. In 15 markets (62%), the branches stretch left meaning that even though data usage grew, ARPU fell. This time, the ARPU erosion in Italy and Spain is the fastest; 13% and 10% respectively.

When comparing to our [previous report](#) (see the miniature to the right) we can see that the 1H 2021 Christmas tree actually represents an improvement with a larger share of



<sup>12</sup> The 24 markets for which regulators to date have reported the necessary underlying stats

countries to the right than previously. That also makes us conclude that the ARPU trends are underlying and driven by competition rather than being defined by the pandemic.

Is **5G** behind the improvement from 2020 to 1H 2021? Two of the leading 5G markets in the world, **South Korea** and **China**, moved from the left to the right of the chart which could be promising for other countries not yet being as advanced in 5G as South Korea and China.

As shown previously in this report, **5G** had a major impact on the data usage in South Korea. And now Korea has a positive ARPU development in Figure 17. Finally one might add. A bit of history is needed here: Korea's ARPU was heavily affected by a government decision taken in 2017 to increase the SIM-only discount from 20% to 25%. This started to have an effect on the ARPU by the end of 2017 and as the typical contract binding period on handset plans is two years in Korea, the effect should have lasted until the end of 2019. The upside of the change has been an equally significant improvement in churn, so it's not all bad.

The Korean operators do not break out their 5G ARPU in their reporting, but by looking at the year-over-year development of the overall mobile service revenue, we could try to see if 5G had a positive impact since its launch in Q2 2019, see Figure 18.

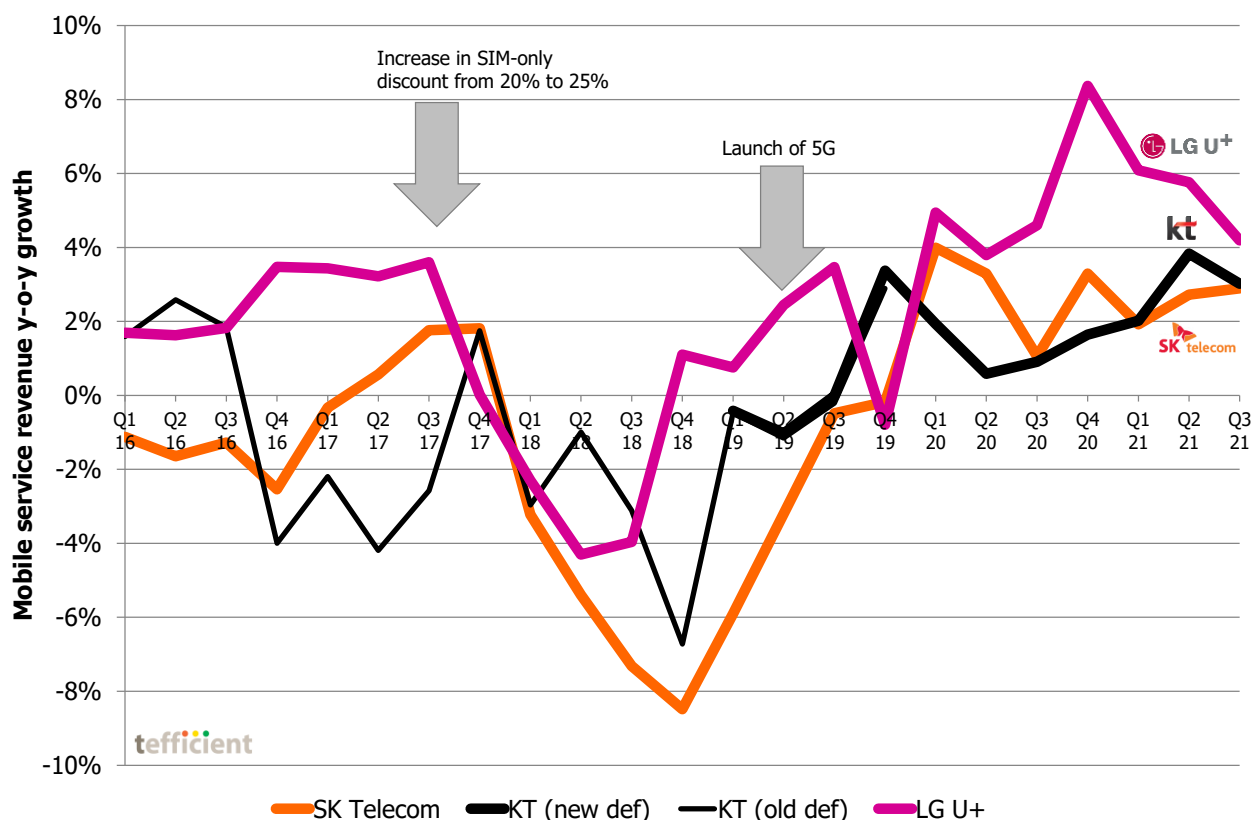


Figure 18. Y-o-Y development in overall mobile service revenue – South Korea

It's clear that the increase in SIM-only discount (see the first arrow) had a negative impact on the mobile service revenue when customers rather took the 25% SIM-only discount than committing to binding contracts with subsidised handsets. At around the time of the second arrow (=5G launch), the overall mobile service revenue started to grow again – LG U+ first, then KT and finally SK Telecom.

There's reason to be positive, but we should also realise that the negative effect of the SIM-only discount increase effectively should have ended by the end of 2019. A cautious conclusion is that 5G *helped* the Korean operators to get back on track. They have now **re-established the revenue growth** they had prior to the increase in SIM-only discount.

5G helped the Korean operators to re-establish growth

Let's also look at China. Figure 19 shows the development of reported overall mobile ARPU. China Telecom and China Mobile (1H 2021) also break out their 5G ARPU. It's important here to emphasise that this is the ARPU derived from users on 5G *plans* – regardless of if they have a 5G device or are within 5G coverage. For customers with high data usage, it was favourable to swap to these 5G plans and to date **almost 700 million** Chinese mobile users have done so. A quite significant share of these are still on 4G: In September 2021 **only 48%** of China Mobile's 5G plan customers were reported as active on China Mobile's 5G network. There are two reasons to why it isn't higher: 1. A certain share of China Mobile's 5G plan customers don't have a 5G device, 2. A certain share of China Mobile's 5G plan customers aren't within 5G coverage.

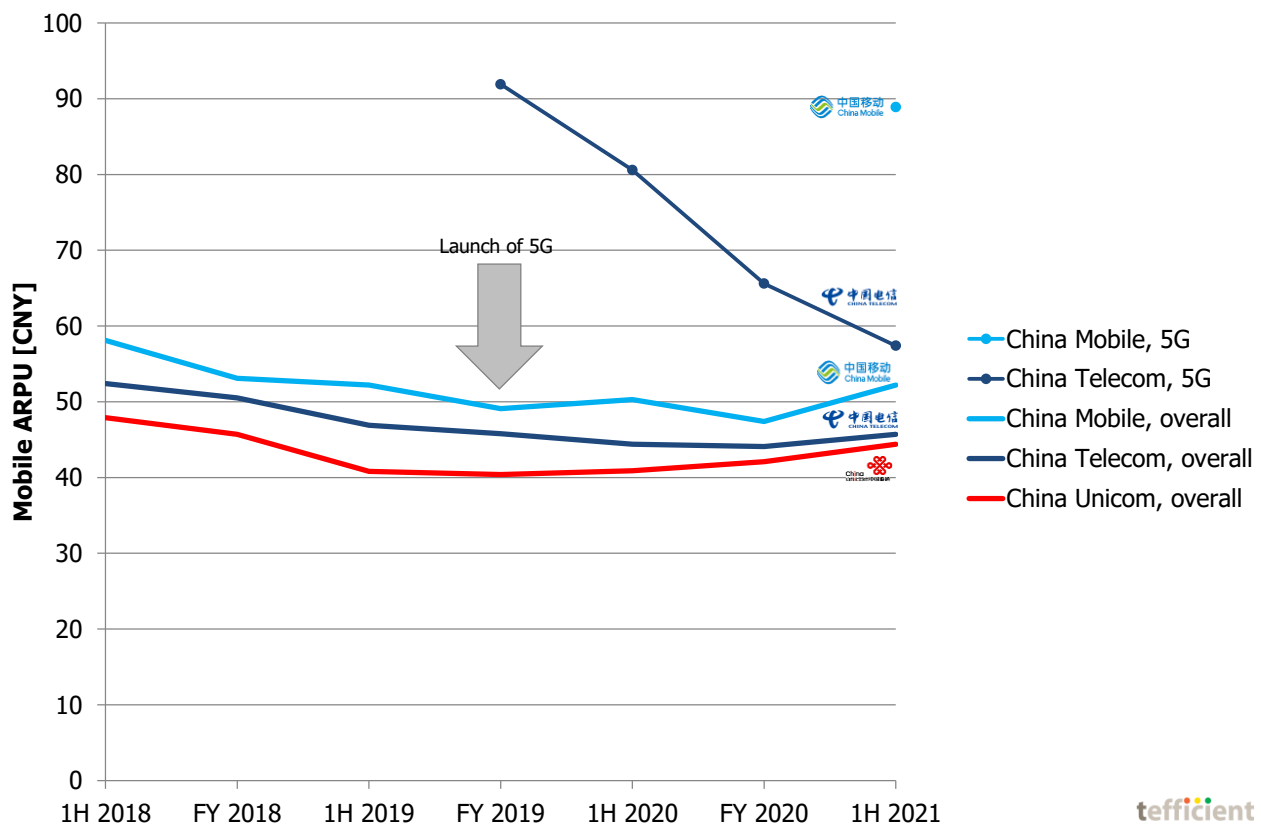


Figure 19. Development in mobile ARPU – China



The overall mobile ARPU in China was in quite fast decline but the launch of 5G in November 2019 seems to have stopped the decline. In 2021 it has perhaps even started to increase.

If comparing the reported 5G plan ARPU with that of the overall base, it's clear that the Chinese operators sell 5G plans with a significant premium. As shown for China Telecom, the 5G plan ARPU has been coming down rapidly with the growing 5G plan base, though. China Mobile still seems to enjoy a significant premium in 5G as its 5G plan ARPU was 89 CNY in 1H 2021 compared to 52 CNY in the overall mobile base. China Mobile is however also the operator with the lowest adoption of 5G plans within its base: 37% in October 2021 – compared to 45% for China Telecom and China Unicom.

5G helped the Chinese operators to turn ARPU development around

With all ifs and buts surrounding the reporting of the Chinese operators, 5G has nevertheless – similar to South Korea – helped the Chinese operators to **turn ARPU around**.

## Conclusion

Mobile data usage is growing in 45 of 46 countries covered by this analysis. The growth rates are very different and so are the usage levels. **Finland** tops the charts – with 27.3 GB per average SIM per month in the first half of 2021. If excluding M2M, the usage grows to 32.6 GB per month. But in spite of **80%** of non-M2M SIMs being **unlimited** and three 5G networks covering at least 53% of the population, the data usage growth rate isn't particularly high in Finland – 22%. Usage in **Peru** grew 53%. The relaxation of the pandemic restrictions generally led to a slowdown in the growth rates compared to 2020.

Our analysis shows strong correlation between the **data-only share** of a country's SIM base and the average data usage. **Latvia, Finland and Bahrain** are the data-only powerhouses of the world. In many markets, **data-only's share of total traffic stabilised on a high level**. The increasing trend started in 2019, before corona. We attribute this to FWA.

While 4G doesn't really drive data usage as such any longer, **5G** is different. At least in South Korea – still the only country with proper reporting on 5G. In Korea, 5G traffic surpassed the 4G traffic in March 2021 and stands for the **majority of the mobile data traffic** since April 2021. The data consumption per 5G subscription is 26.8 GB per month – about **2.2 times** that of the average subscription. 5G seems to have helped Korean operators to re-establish mobile service revenue growth overall. 5G also seems to have **helped the Chinese operators to turn the overall ARPU development around**.

Regardless of technology, data usage could be elevated by an increased data-only penetration through fixed-line substitution. But a prerequisite for this – and for high data usage in general – is that the **total revenue per gigabyte** is low.

This is the case in **India, Latvia, Lithuania, Taiwan, Pakistan, Finland, China, Turkey, Poland, Estonia** and **Bahrain**. **Canada, Belgium, New Zealand, Luxembourg** and **Germany** represent the other end.

Low usage doesn't necessarily mean low ARPU, though. Market ARPU is uncorrelated with usage. **USA** and **Canada** have much higher ARPU than other countries without having high usage.

What is worrying is that **only 9 of 24 markets could grow ARPU** on the back of data usage growth. It's easy to blame corona for it, but that share is actually better than what we have had in our previous country analyses.