

Industry analysis #3 2017

Mobile data – first half 2017

“More for less” tips the balance



This is tefficient’s 17th public analysis of the development and drivers of mobile data.

Mobile data usage is still growing in all of the countries covered by this analysis. The growth rates are very different and so are the usage levels. Finland tops the charts in usage – but not in growth.

Data-only is a clear driver of usage. Austria emerges as the fixed-line substitution leader. In Korea, the share of data traffic on 4G has now effectively reached 100%. In mature markets, the 4G upside on data usage is mainly a thing of the past.

A prerequisite for continued data usage growth is that the total revenue per gigabyte is low.

This is not the case in Greece, Canada, Belgium, Germany and Czechia. The total revenue per gigabyte here is roughly 20 times higher than in

Finland. Of these countries, Canada stands out with its combination of low data usage and high ARPU.

In this analysis we introduce the Christmas tree visualisation to see where the “more for more” initiatives of operators can balance the “more for less” erosion.

This is an updated version of the original version published 19 December 2017: 1H 2017 stats for the Netherlands have been added and the revenue for Finland has been adjusted. The analysis focuses on 35 countries. We have issued a separate public analysis that compares mobile *operators*:

<http://tefficient.com/spotting-the-operators-capable-of-monetising-the-data-usage-growth/>

Data usage continues to grow – spans from 0.8 to 11.3 GB per SIM per month

Figure 1 shows the development of mobile data usage for 35 countries where regulators¹ report mobile data traffic. To add some colour to our comparison – which otherwise mainly covers mature markets – we have added **China** and **India** – two markets where mobile data develops fast.

But if we start from the top, **Finland** and **Taiwan** are still holding the number one and two positions in the world when it comes to mobile data usage. The average Finnish SIM card² carried 11.3 GB of data per month in 1H 2017. **53%** of the Finnish SIMs (60% if excluding M2M) had **unlimited data volume** in June 2017.

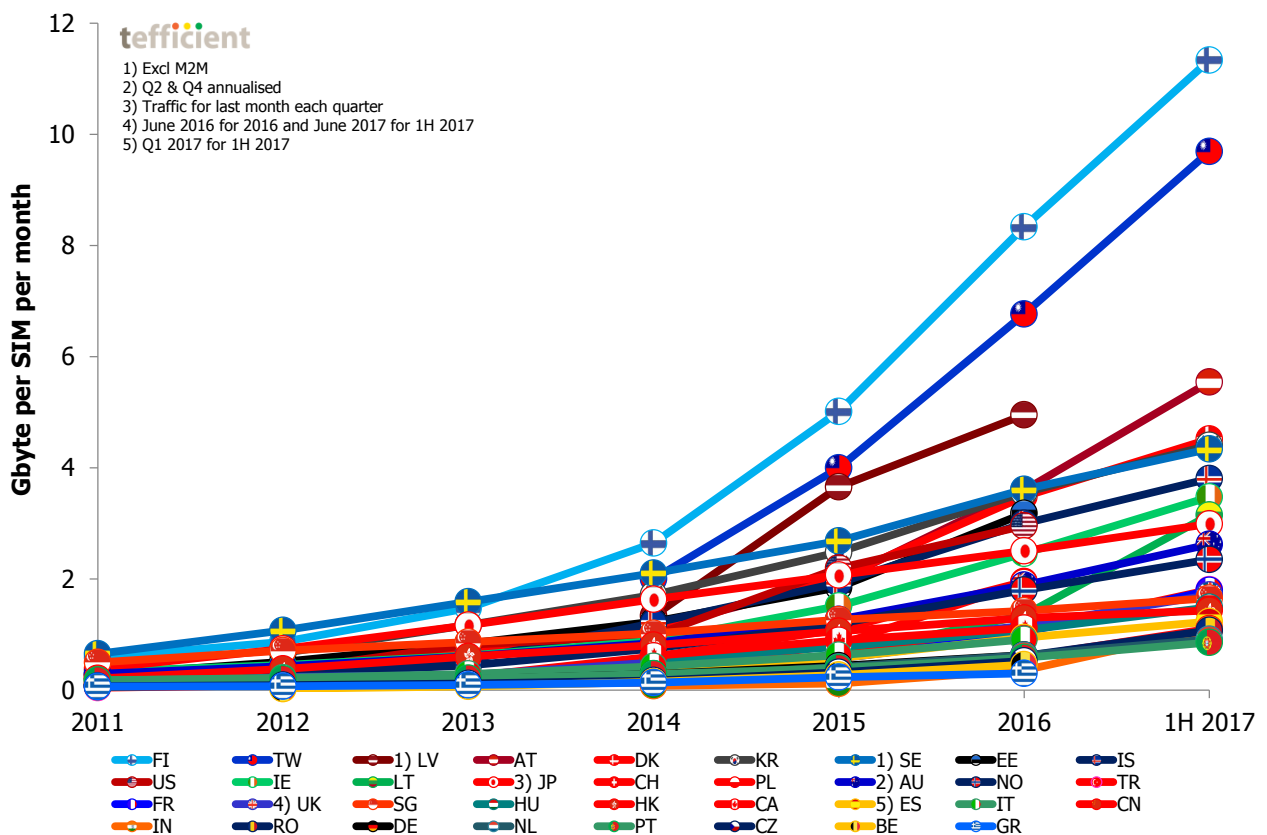


Figure 1. Development of mobile data usage per SIM per month – per country

The average Taiwanese SIM carried 9.7 GB per month. Unlimited data is behind Taiwan’s usage development as well, but since a large share of lower-priced subscriptions are unlimited only within the binding period of a contract, it remains to be seen if the Taiwanese mobile data usage growth will cool off at some point.

¹ Exception: USA, where data is from industry body CTIA

² When we say ‘per SIM’ we include all SIMs in a market – also M2M – unless explicitly stated differently

Austria's mobile data usage is developing quickly. **Fixed-line substitution** is a major driver of the development, fuelled by Austria's generally weak position within fast fixed broadband and fibre to the homes. Since Latvia reports once a year, it's not yet possible to say if Austria has passed Latvia to become the new number three in our comparison.

Other countries with relatively high data usage are **Denmark, Korea** (hiding behind **Sweden**), **Iceland** and **Ireland**. Based on 2016 statistics, Estonia and USA should likely also be in this group.

The legend of Figure 1 is showing the ranking of the 35 studied countries. But since it's difficult to spot all countries, Figure 2 is showing the ranking based on 1H 2017 data.

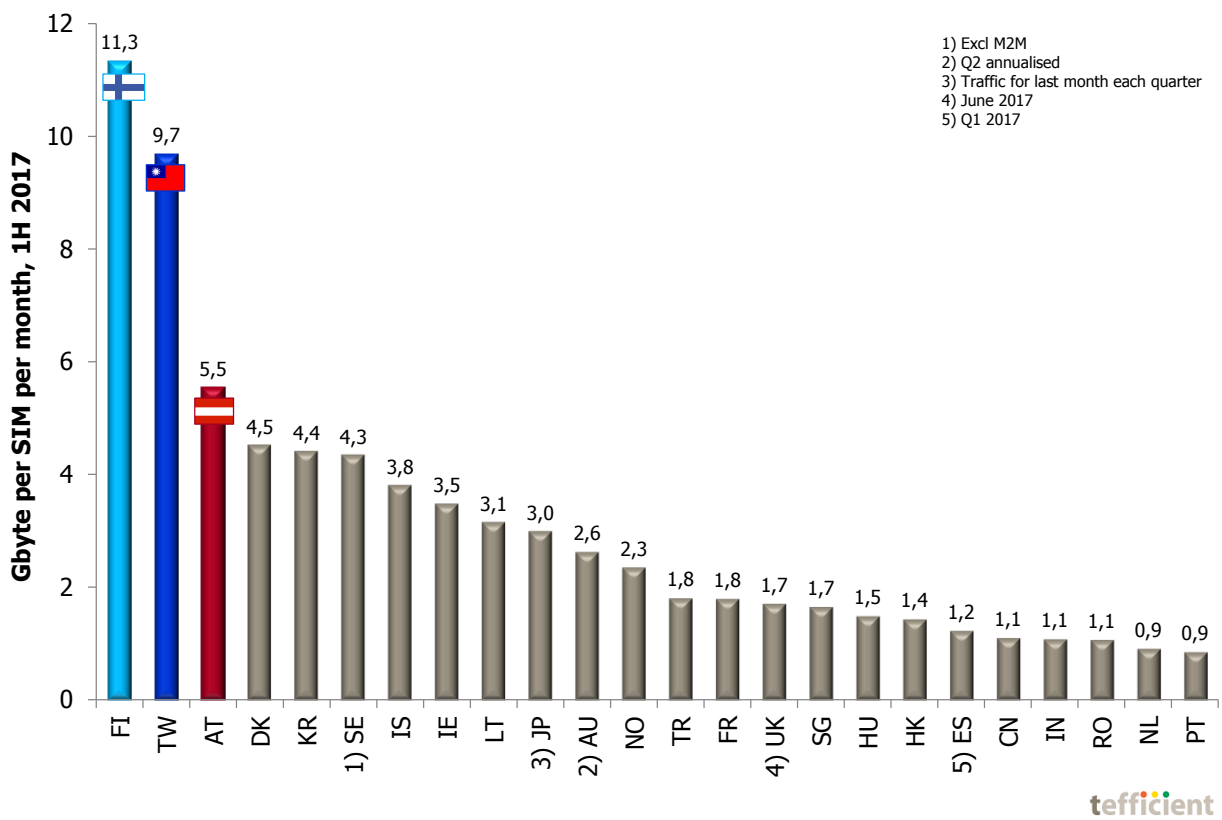


Figure 2. Mobile data usage per SIM per month, 1H 2017 – per country

Since countries that only report once a year aren't included in Figure 2 it can appear as if Portugal has the lowest data usage. This is likely not the case. To visualise the development also for the lowest usage markets, Figure 3 gives a zoom-in on Figure 1.

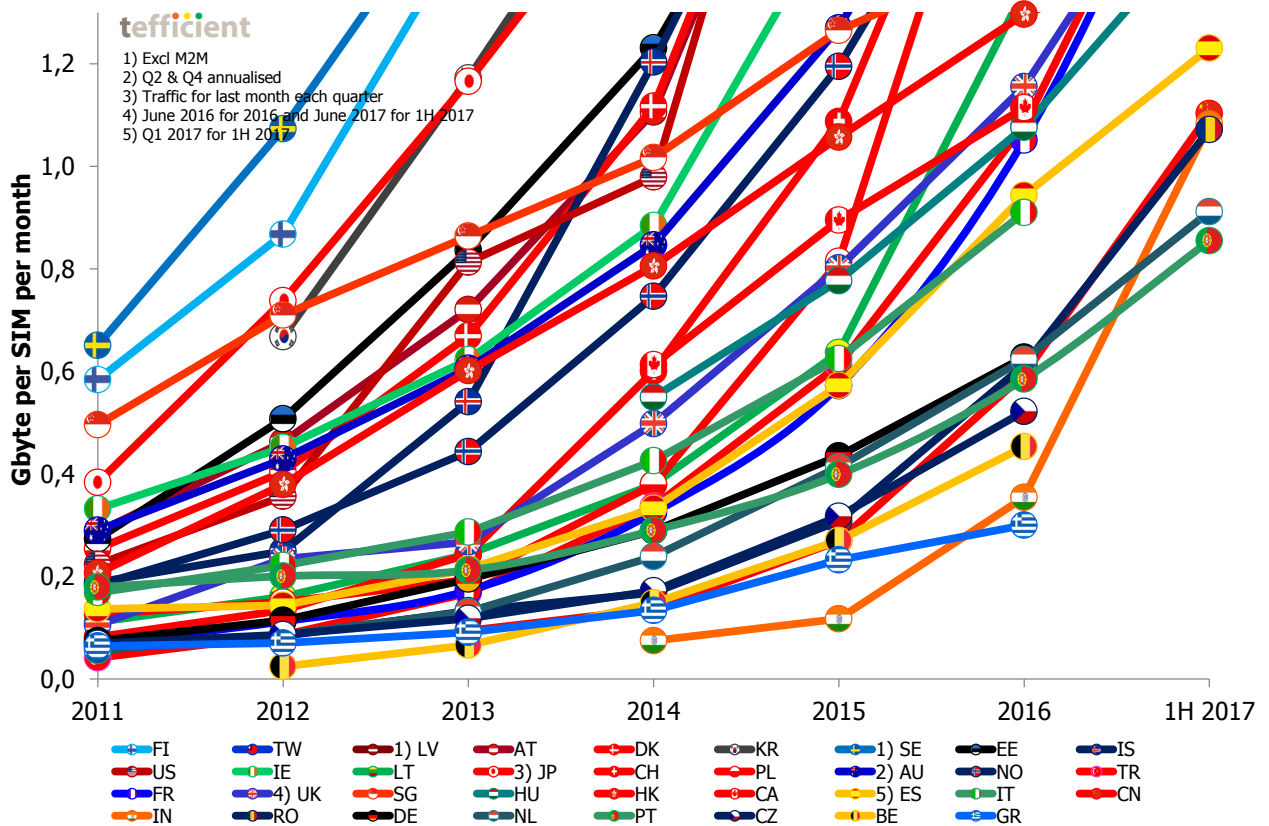


Figure 3. Development of mobile data usage per SIM per month – per country [zoom-in on low end]

2016 stats are instead suggesting that it is **Greece, Belgium** and **Czechia** that feature the lowest data usage. These three countries had an average data usage level lower than that of Sweden and Finland five years earlier.

Note how **India** (orange line) overtook several mature markets in 1H 2017 driven by Jio's disruptive entry. **China** (red line) has also had fast data usage growth in the wake of its fast 4G rollout, but India is now just marginally behind China.

Data usage growth fastest in India

Figure 4 shows the growth in average usage per SIM between the full year of 2016 and the first half of 2017.

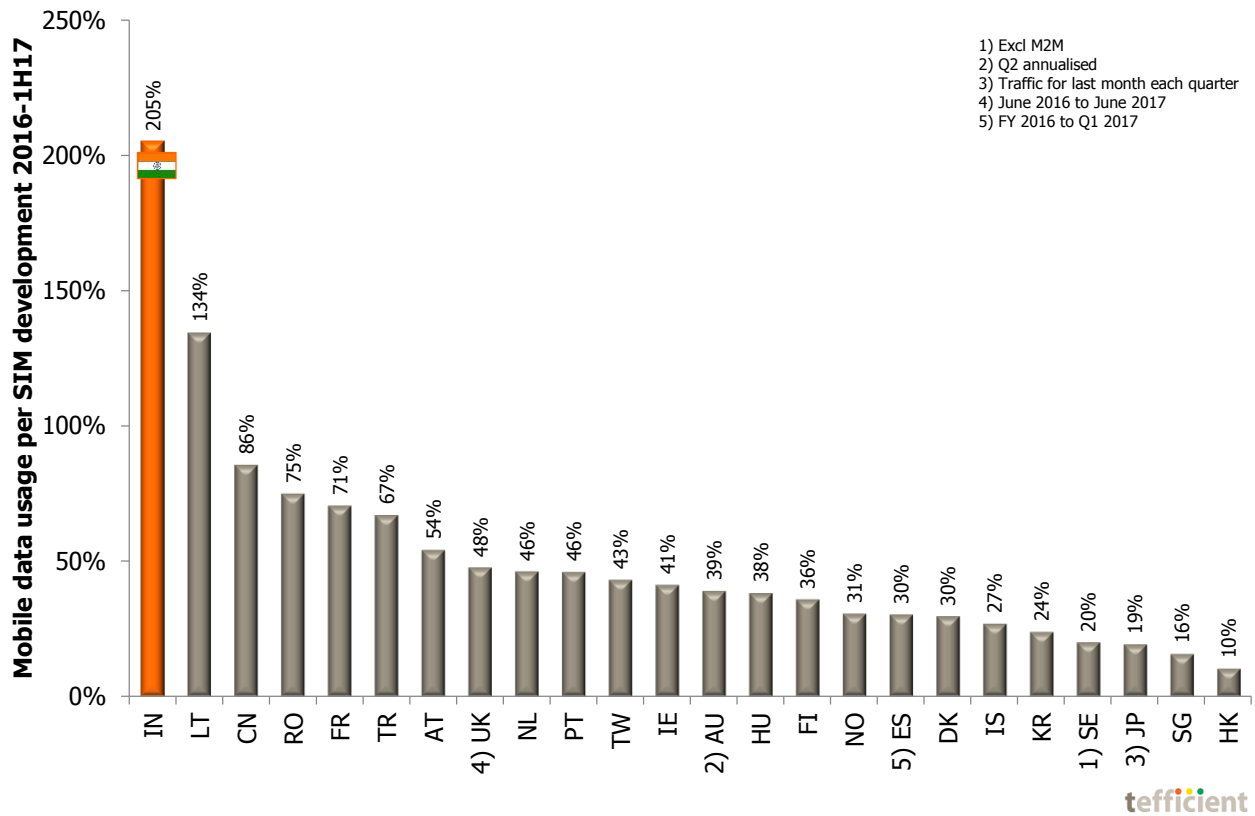


Figure 4. Development of mobile data usage per SIM FY 2016-1H 2017 – per country

Figure 4 can't obviously contain countries which only report annually but even so, it's highly unlikely that any other country could have matched **India's** 205% growth in average usage in 1H 2017 vs. the average usage of 2016. A growth that should be attributed to one operator, **Jio**.



Second-ranked **Lithuania** appears to have had very fast growth in data usage as well, but here we are facing a reporting comparability issue: Since January 2017, the Lithuanian regulator has included the traffic of fixed-line substitution specialist Mezon. Their products used to be WiMax based, but the company shifted to 2.3 GHz TDD LTE during 2016. Mezon's traffic is not reported for 2016, hence the shown growth rate of 134% is exaggerated, but unclear how much. In [2016](#), Lithuania was – without Mezon – number two in data usage growth, so the underlying growth is likely high, but not as high.

Other countries with high usage growth are **China, Romania, France** and **Turkey**. France stands out as it is the only country among the quickest growth countries that can't be said to be a developing market. In January 2017, **Bouygues** introduced a fixed-line substituting 4G Box sold in areas outside of Bouygues'

fixed network reach. In March 2017, **Free** removed the data cap for mobile customers that also subscribe to Free's triple-play service.

The French mobile data traffic has grown very quickly for a long time, though. Figure 5 shows that the year-on-year growth has **accelerated** even since the fourth quarter on 2015.

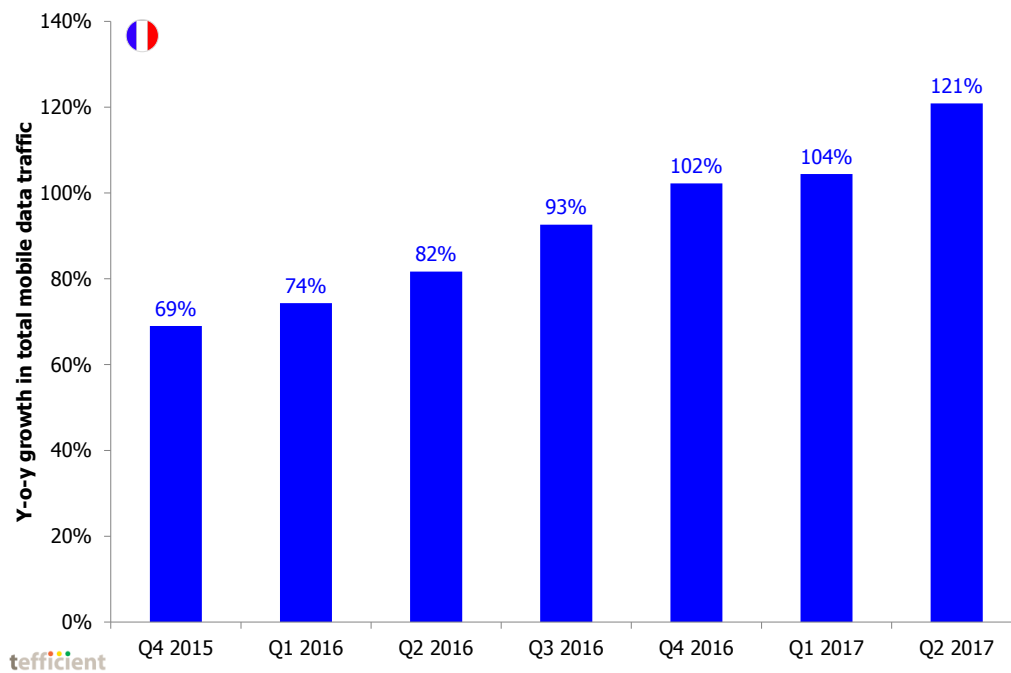


Figure 5. Year-on-year growth in total mobile data traffic – France

Returning to Figure 4, we can see that the countries with the slowest growth in mobile data usage are the mature Asian markets **Hong Kong** (+10%), **Singapore** (+16%), **Japan** (+19%), and **Korea** (+24%). Plus a European country that has had disappointing growth in data usage for a long time: **Sweden** (+20%).

Public **Wi-Fi** is a contributor to the low usage growth rates in the mentioned mature Asian markets. Whereas most other markets in our analysis (see Figure 1) has an exponential growth in mobile data, **Hong Kong** stands out as a market with only linear growth – see the red line in Figure 6.

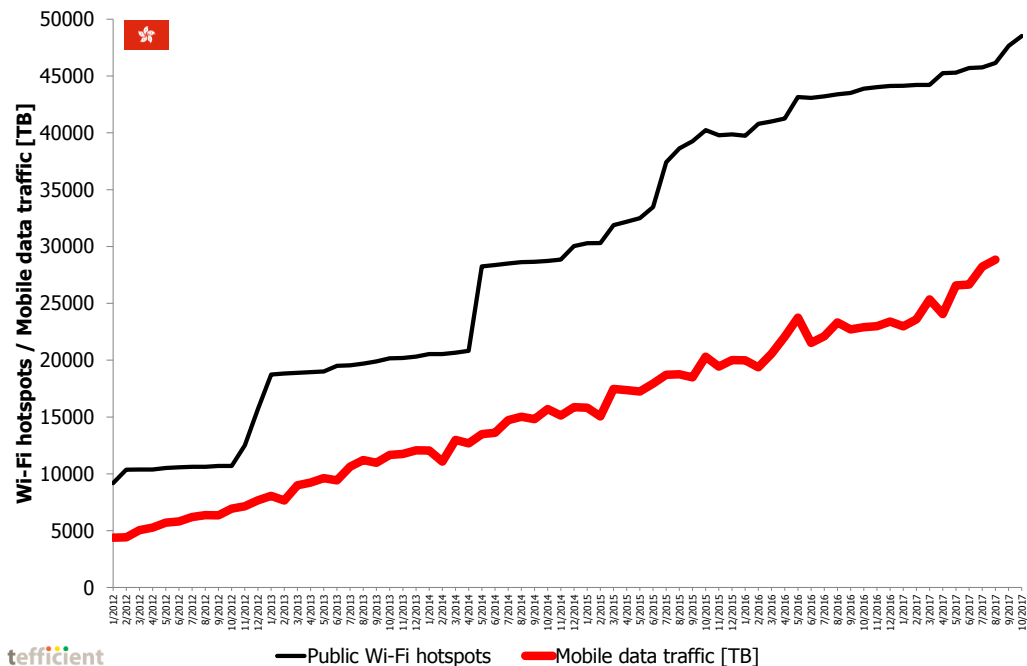


Figure 6. Comparing the development of mobile data traffic to the number of operator Wi-Fi hotspots – Hong Kong

The upper, black, line shows the number of public Wi-Fi hotspots that are operated by Hong Kong's telecom operators. Based on the data reported by the regulator OFCA, we can't say how much of the mobile data traffic that is **offloaded to Wi-Fi**, but it's clear that Hong Kong's operators have expanded the number of Wi-Fi hotspots much during the five years displayed in Figure 6.

The number of Wi-Fi hotspots in Hong Kong is more or less matching the number of cellular base stations – approximately 48000. Hong Kong's two largest mobile operators, '3' and CSL/HKT are reporting 25000 and 15000 Wi-Fi hotspots respectively. Wi-Fi offload is automatic – using EAP-SIM and/or Hotspot 2.0 – without user interaction.

The operators in Singapore – and in particular Japan and Korea – are also having large public Wi-Fi networks.

The low usage growth in **Sweden** can't be explained by operator-deployed public Wi-Fi. Unlimited mobile data plans were introduced by Tele2 and Telenor in Sweden in the end of the first half of 2017. Priced with a premium compared to unlimited plans in e.g. Finland or the Netherlands, the take-up has likely not been significant enough to move the needle in 1H 2017. The most likely explanation to the low usage growth in Sweden is however the continued expansion of fibre to the homes.

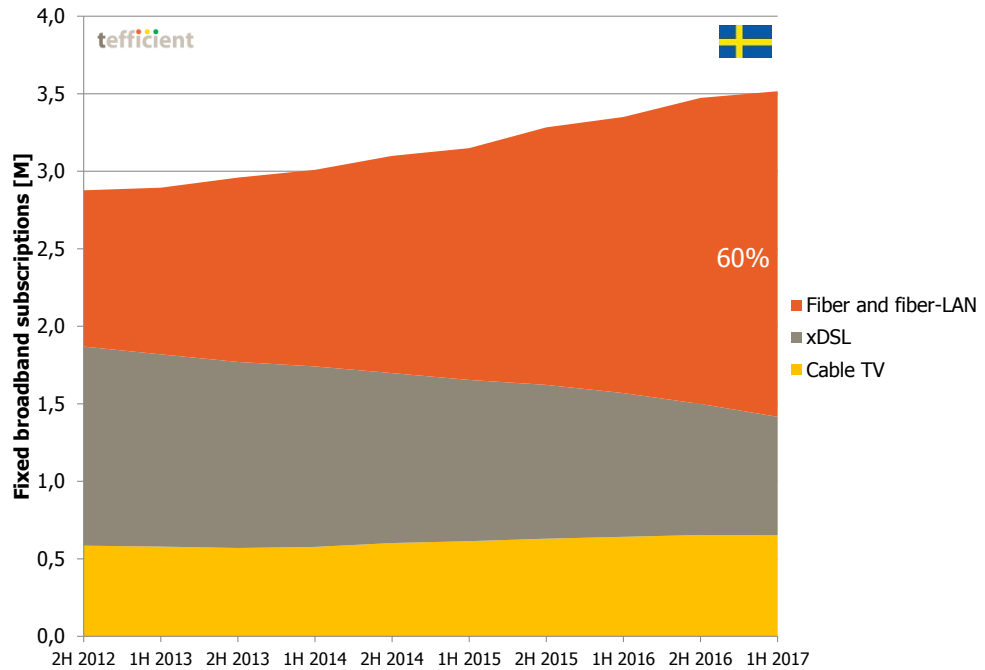


Figure 7. Development of fixed broadband subscription base and distribution – Sweden

A full **60%** of the Swedish fixed broadband market was FTTB or FTTH in June 2017 – see Figure 7 above – and the aggressive fibre deployment is making the total Swedish fixed broadband market grow quite quickly. FTTH brings very fast connections (with quite fast Wi-Fi) to Swedish households that previously likely only could get DSL. The growth within fixed automatically moves mobile data traffic to Wi-Fi within the boundaries of the home since smartphones by default prefer Wi-Fi over cellular.

Large operator Wi-Fi networks and FTTH can slow mobile data usage growth

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

We touched upon how Wi-Fi and fibre rollout could affect mobile data usage. But mobile operators could also address the home market with **fixed-line substitution** offers. The take-up can be significant if these offers are reasonably charged and come without volume limitations. It also helps if they fixed broadband offering is weak with much DSL is the mix.

This pretty much described the situation in **Austria**, a country that starts to emerge as one of Europe’s mobile data leaders. To begin with data-only for home use – with unlimited data volume, but with speed tiers – was offered by the challenger operator, ‘3’, but T-Mobile and finally even the fixed line incumbent, A1, followed with offers that are structured in essentially the same way.

As shown in Figure 8 below, T-Mobile and A1 are currently both pricing themselves into the market, offering the first three months for less than 10 EUR regardless of speed tier.

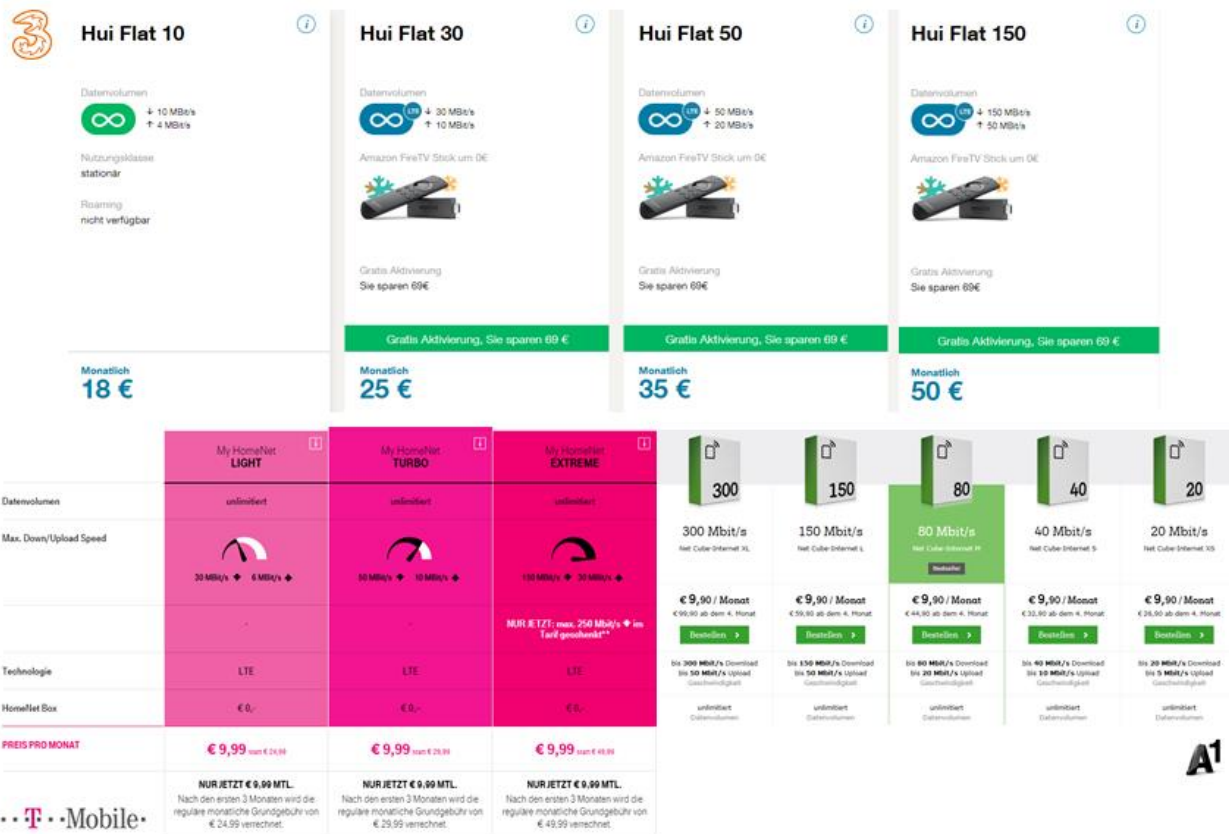


Figure 8. Current fixed-line substitution offers – Austria

Figure 9 plots the average data usage per SIM vs. the data-only penetration of country SIM base. Given our introduction, it’s perhaps not surprising to find that Austria has the highest data-only penetration of our studied countries; **23.7%** in June 2017.

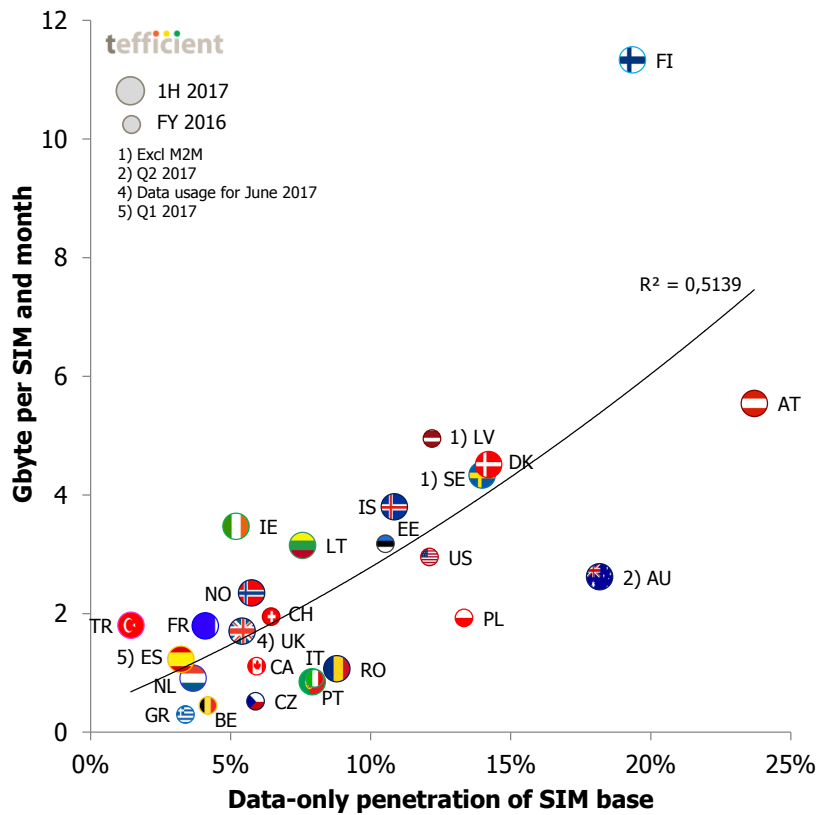


Figure 9. Mobile data usage vs. data-only penetration

The data-crazy **Finland** actually had a bit of a decline in its data-only penetration with 'just' 19.3% of base being data-only in June 2017 (vs. 19.6% in December 2016). Also in **Australia** data-only is popular, but it doesn't have the same effect on data usage as elsewhere.

Generally speaking though, the adherence to the regression line is quite strong. Countries without a developed data-only market such as Greece, Belgium, the Netherlands and Czechia are also having a low average data usage. An exception is Turkey where average data usage is high in spite on a near non-existent data-only market.

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.

Some of the countries in Figure 9 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 10.

Data-only penetration is a significant driver of mobile data usage

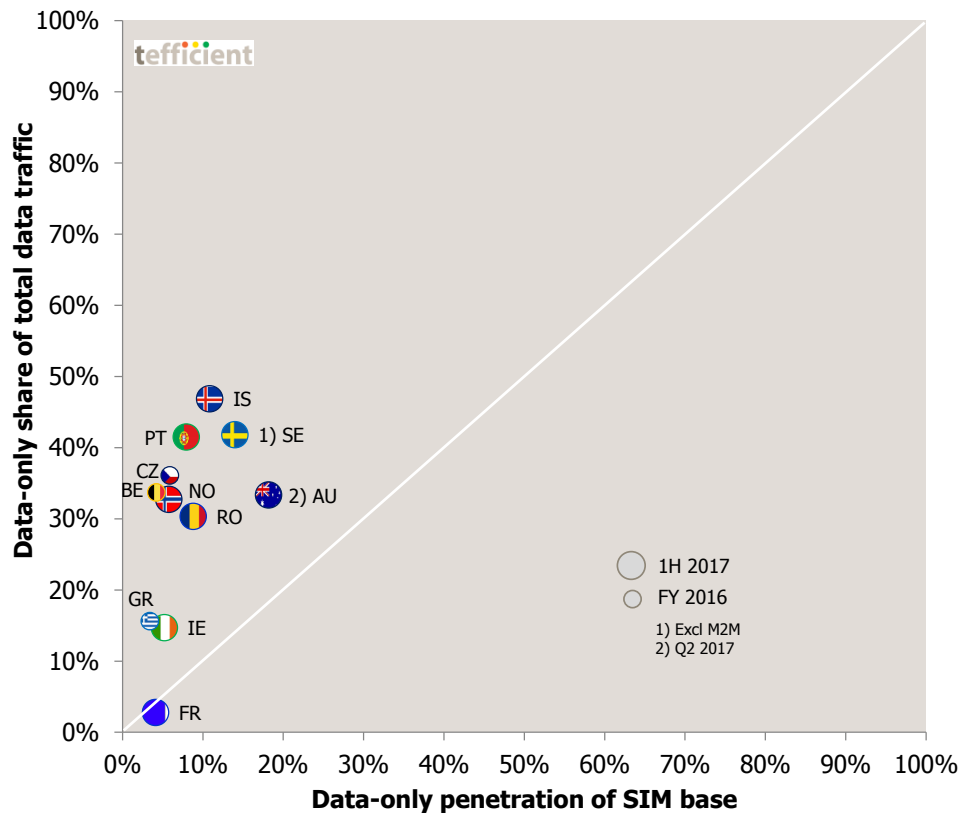


Figure 10. Data-only share of total traffic vs. data-only penetration

With the exception of France, data-only SIMs are carrying a disproportionately high share of the data traffic:

- Belgium **8x** higher traffic per data-only SIM vs. any SIM
- Czechia **6x**
- Norway **6x**
- Portugal **5x**
- Greece **5x**
- Iceland **4x**
- Romania **3x**
- Sweden **3x**
- Ireland **3x**
- Australia **2x**
- France **1x**

4G adoption a weakening driver of data usage

If data-only defines overall data usage, the same can't really be said for 4G.

Figure 11 plots the average data usage per SIM vs. the 4G adoption within the country SIM base. **Korea** is highest with 77% followed by **Taiwan** and **Singapore** with 71%. But the adherence to the regression line is much weaker than in the previous data-only section.

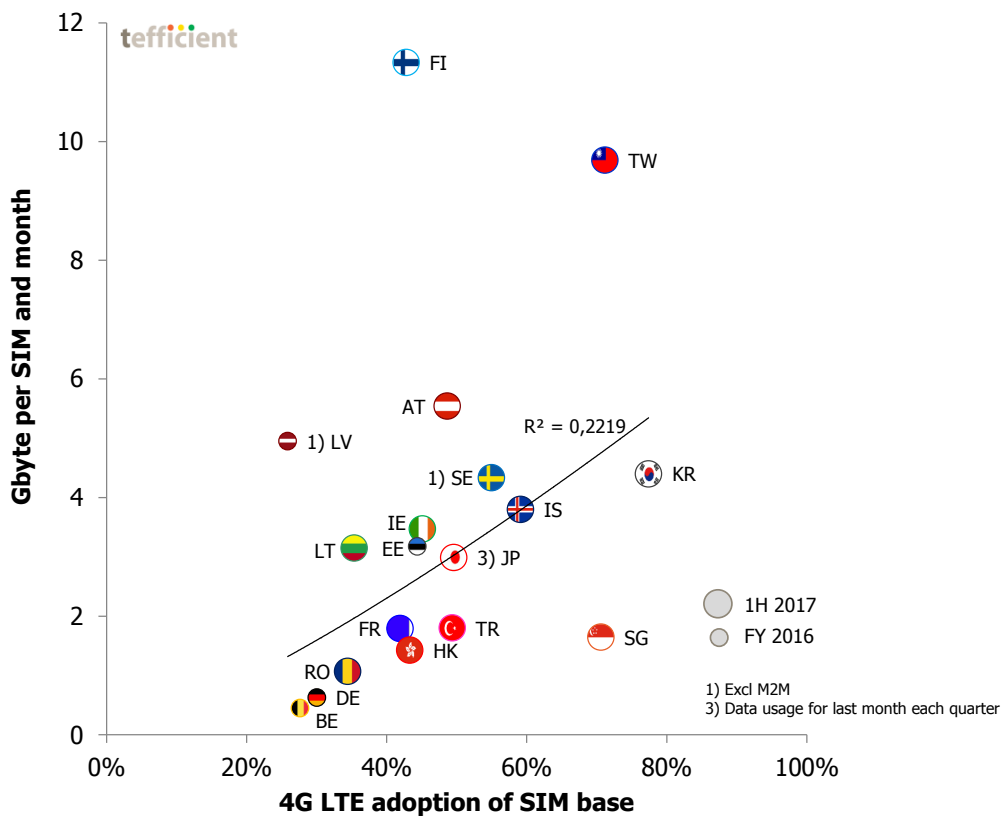


Figure 11. Mobile data usage vs. 4G LTE adoption

In Finland, only 43% of SIMs have subscriptions which allow 4G speeds³ but the average data usage is still much higher than Korea. While operators from time to time still like to report that 4G drives data usage, Figure 12 shows that 4G in itself is a much weaker driver of traffic than data-only (compare with Figure 10).

Korea has already reached the point where essentially all data traffic is on 4G. This happened even though the 4G penetration was 'just' 77% in June. The three MNOs in **Japan** are also approaching the point where all mobile data traffic is on 4G. The

4G adoption is a weakening driver of mobile data usage

³ Higher or equal than 30 Mbit/s

position of **Turkey** in Figure 12 is also interesting; it might be considered as a developing market compared to the European markets in the chart, but Turkey's share of data traffic on 4G is higher. It suggests that the Turkish operators skipped 3G data to more or less immediately move into 4G.

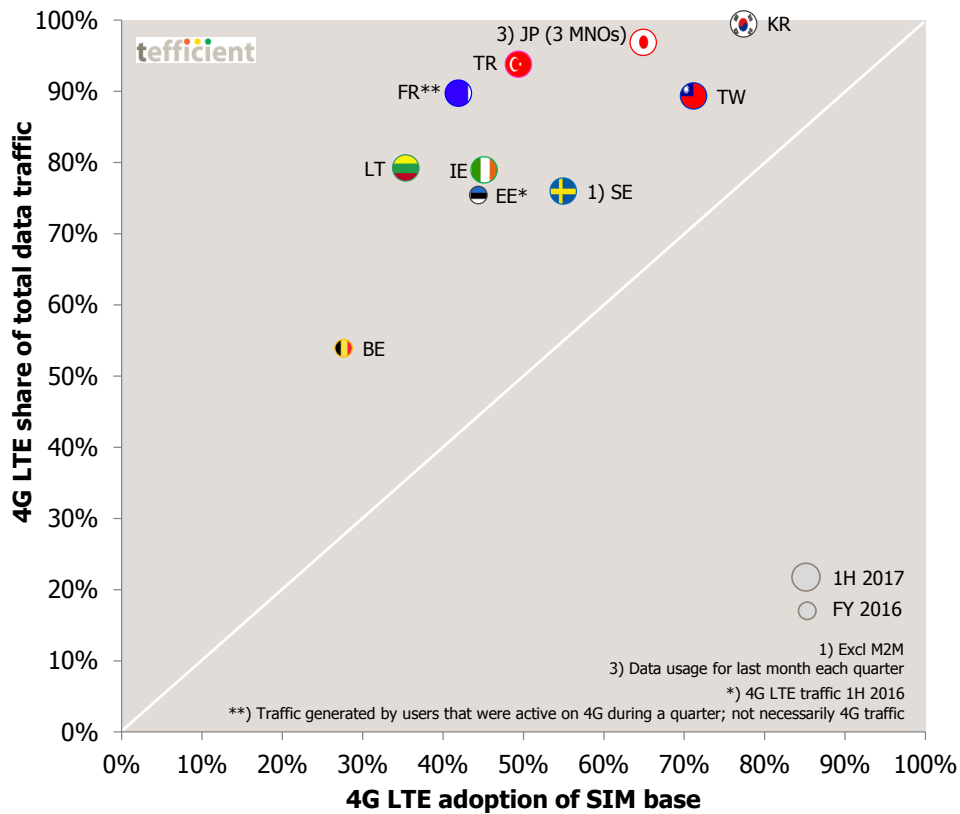


Figure 12. 4G LTE share of total traffic vs. 4G LTE adoption

Without exceptions, 4G LTE users are carrying a disproportionately high share of the data traffic – but in comparison to data-only, the multipliers are much lower:

- Lithuania **2.2x** higher traffic per 4G LTE user vs. any SIM
- France **2.1x⁴**
- Belgium **2.0x**
- Turkey **1.9x**
- Ireland **1.8x**
- Estonia **1.7x**
- Japan **1.5x**
- Sweden **1.4x**

⁴ As said in the ** footnote in the graph; the French traffic isn't necessarily all 4G traffic, but traffic generated by users that have been active on 4G during a quarter

- Korea **1.3x**
- Taiwan **1.3x**

If comparing with Figure 11 it is clear that the 4G multiplier drops with an increasing 4G adoption. It is, in other words, when 4G still has relatively low adoption – like in Lithuania, Belgium and France – that it makes a difference for the overall data usage. Once 4G has become more common, the effect of the early adopters is watered out and the delta between a 4G user and any SIM becomes smaller.

Over time, the 4G penetration will grow – simply because new terminals will, almost by default, have 4G – but it will no longer have any strong impact on the average data usage.

The total revenue per GB can vary with a factor of 26

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 remaining 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 plan⁵ – which means that price still, essentially, is about data volume.

Figure 13 plots the *total* mobile service revenue per gigabyte⁶ against the average mobile data usage per SIM and month.

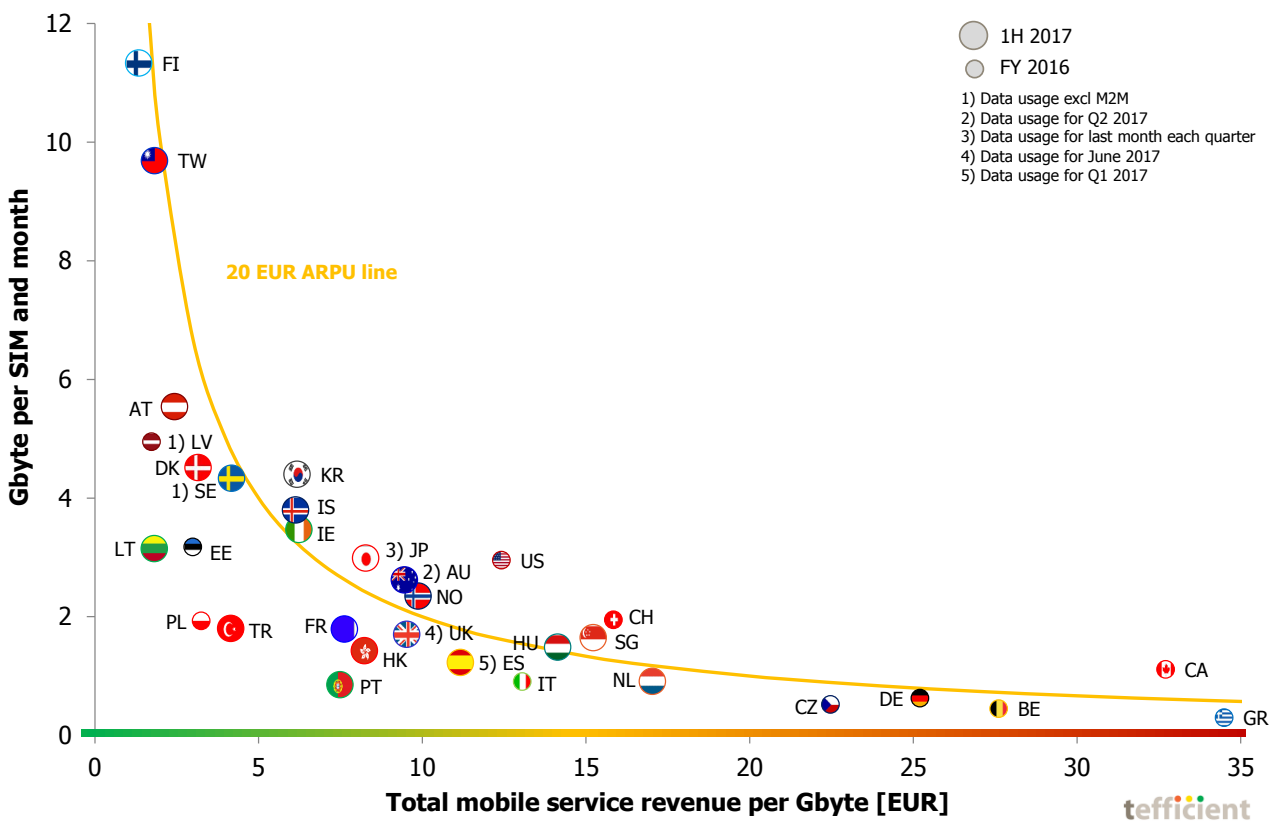


Figure 13. Mobile data usage vs. total mobile service revenue per consumed Gbyte

The amber line shows where **20 EUR of ARPU** is earned. Countries below it had an ARPU lower than 20 EUR; countries above an ARPU higher than 20 EUR.

There are five countries where operators enjoy much higher total revenue per consumed gigabyte: **Greece, Canada, Belgium, Germany and Czechia**. The positions of these countries are based on 2016 statistics

⁵ There are exceptions to this, e.g. Elisa, DNA and Swisscom, 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.

⁶ Attributing zero value to voice and messaging

(simply because of these regulators not reporting more frequently than calendar year or, as in the case of Greece, not yet having reported any 2017 stats). If 1H 2017 statistics would be available, the positions would move left towards lower total revenue per GB. There would still be a gap to the other countries, though: The movements are not that fast and these countries have been classified as 'expensive' in every analysis we have issued done since 2012. It's important to point out that our analysis looks at what the mobile operator industry *de facto* charges end-users, not what the currently best offer on the market 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 a better deal.

In the other end of the scale we find the countries where operators get the lowest revenue per consumed gigabyte: **Finland, Latvia, Lithuania, Taiwan** and **Austria**.

Looking at Figure 13 we can conclude – as in all our previous analyses on this topic – that 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 9.

Finnish operators have the lowest total revenue per gigabyte – Greek operators the highest

Only weak correlation between data usage and ARPU

Figure 14 is a variant of the just-shown revenue per GB chart – it plots the usage against the average revenue per SIM, i.e. the ARPU.

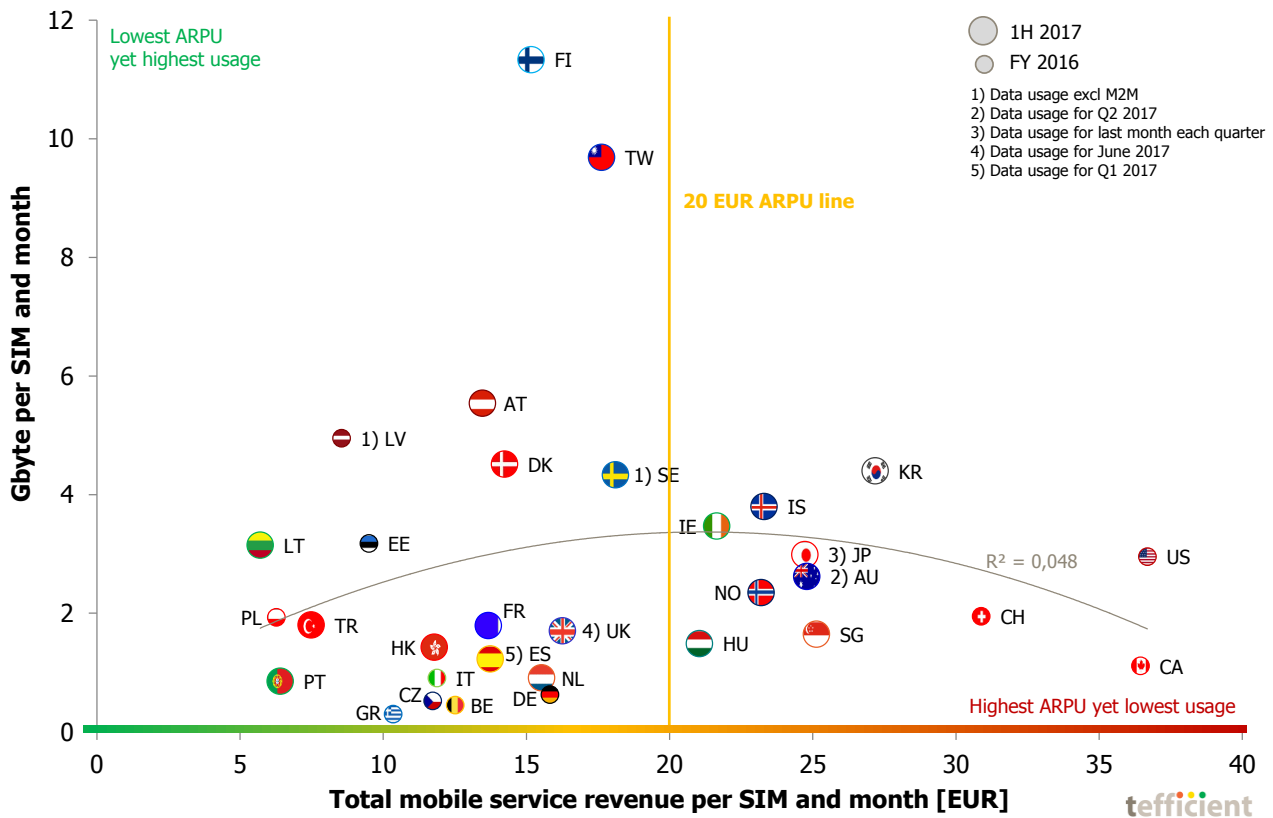


Figure 14. Mobile data usage vs. total mobile service revenue per SIM

Of our studied markets, there are three where operators derive ARPUs much higher than elsewhere: **USA, Canada and Switzerland**. As mentioned previously, 1H 2017 positions (if available) would likely have moved to the left in the chart, but it's highly unlikely that USA, Canada and Switzerland would have closed the gap on the other countries.

Operators in the upper left corner – such as **Finland, Austria, Latvia, Lithuania and Poland** – are being the most generous with mobile data considering their ARPU.

It's disappointing to see that the regression line isn't pointing in a north-easterly direction; there is not much in Figure 14 that suggests that operators in a country can expect to get rewarded with higher ARPU when usage grows. The adherence to the line is also very weak.

But isn't every other operator telling that they have a "more for more" strategy? I.e. they will give customers more data *if* they pay more. As shown already in our [previous analysis](#), this is rather wishful

thinking than reality. Many operators are giving customers more data regardless. This means that most operators should be proud for “more of the same” since quite many actually experience “more for less”.

To demonstrate, we introduce the *Christmas tree graph*.

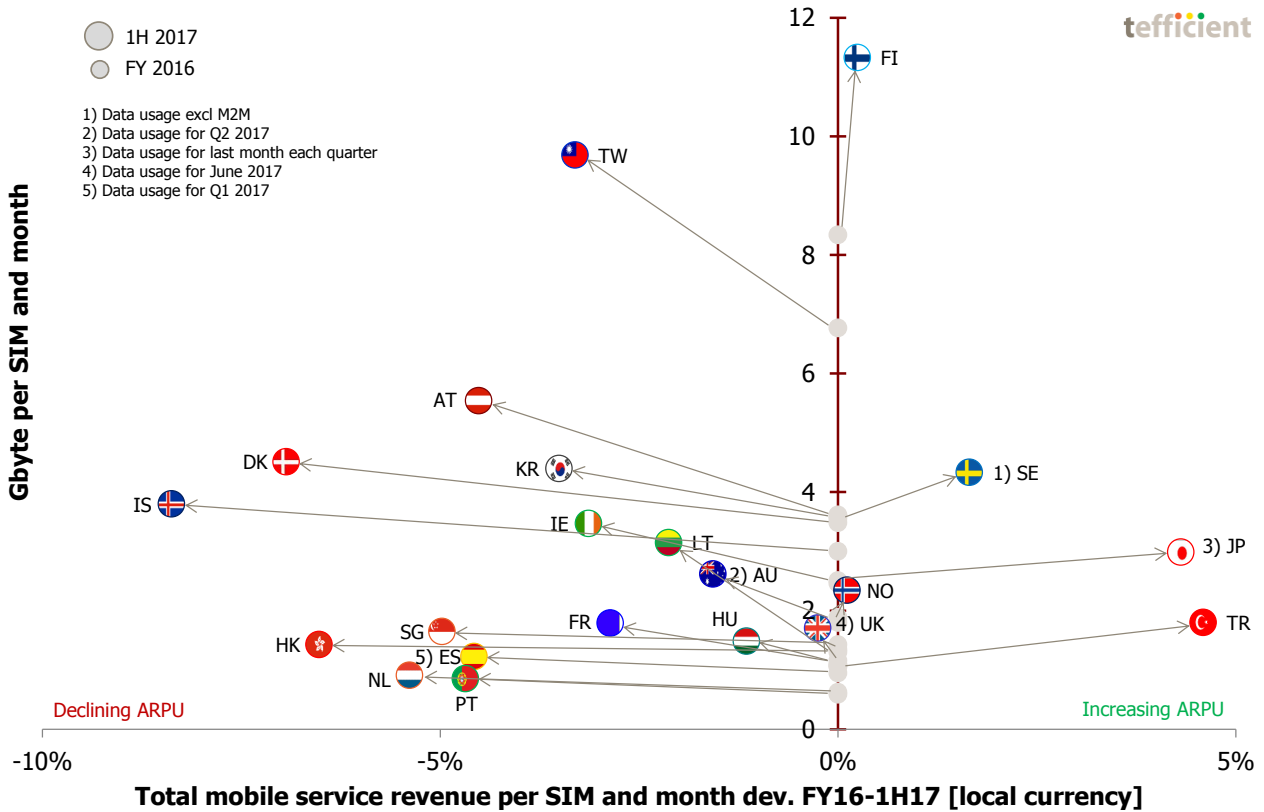


Figure 15. Mobile data usage vs. development in total mobile service revenue per SIM – with trends from 2016

Just like the branches of a Christmas tree, all arrows in Figure 15 are going upwards since data usage is growing in every single country. But the tree is unbalanced: Too many branches are pointing left towards lower ARPU – too few pointing right towards higher ARPU. It’s quite an unsightly Christmas tree to be honest.

There are only five markets in which the growth in data usage has led to a growth in ARPU (in local currency): **Turkey, Japan, Sweden, Finland** and **Norway** (just, but still). These markets could be classified as “more for more” markets. It doesn’t mean that every operator in these markets is successful, though.

In most markets it’s not “more for more” – it’s “more for less”

In all the other markets, the mobile ARPU has declined in spite of the growth in mobile data usage. These markets are “more for less”. This doesn’t mean that every operator in these markets is losing.

The next graph, Figure 16, shows how fast the **erosion** in the total mobile service revenue per gigabyte has been in 1H 2017.

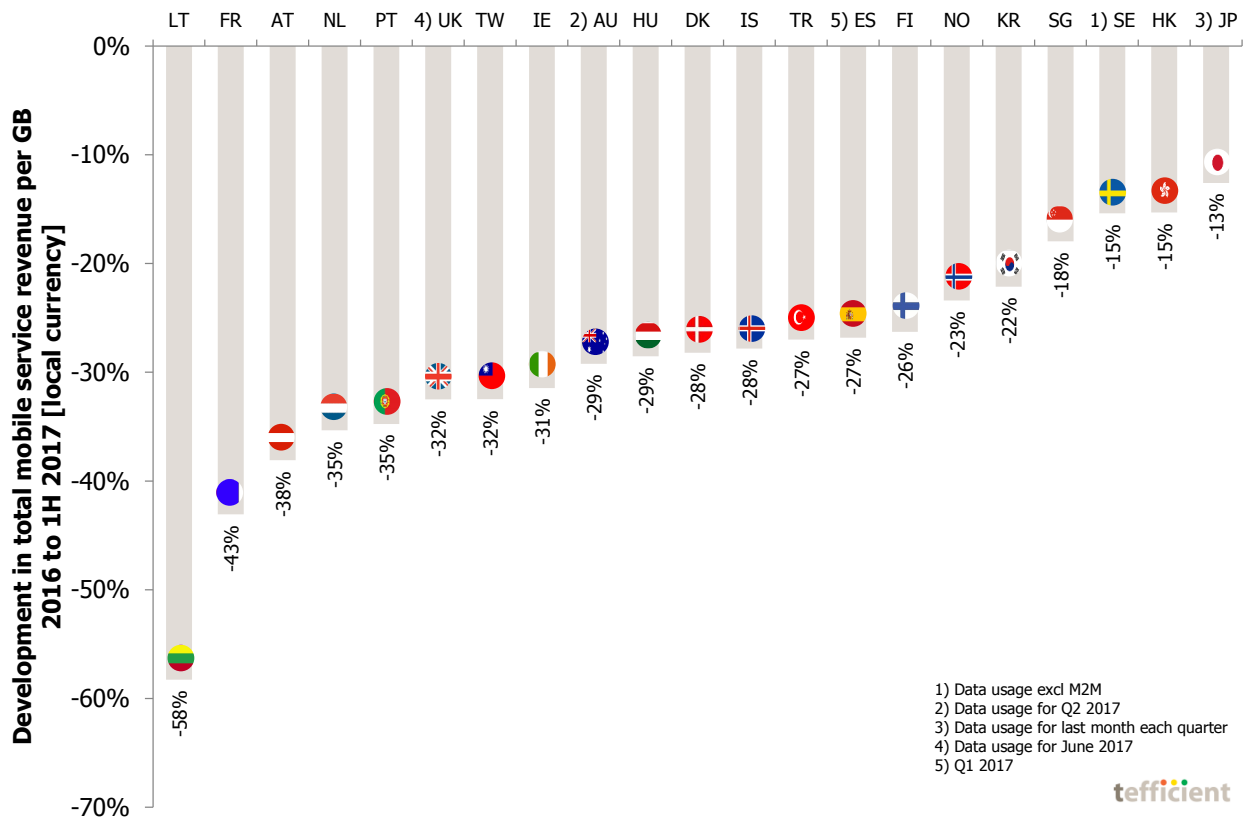


Figure 16. Erosion in total mobile service revenue per GB – 2016 to 1H 2017

Lithuania, in part due to the mentioned comparability issue due to the inclusion of Mezon, had the fastest erosion: -58%. **France**, featuring the quickest usage growth of more mature markets, follows with -43%. The erosion is also fast in **Austria**, the **Netherlands**, **Portugal**, the **UK**, **Taiwan** and **Ireland**.

In the other end of the scale we find the markets that also had the lowest growth rates in data usage:

Japan, **Hong Kong**, **Sweden**, **Singapore** and **Korea**.

Will the future hold even faster revenue erosion? Many operators have introduced plans with unlimited data in the first half of 2017 – won't that make things worse? Not necessarily; as said, these plans are typically *premium* plans. They will drive data usage, but perhaps not as much as expected as the primary motivation to buy them seems to be **peace of mind** – as opposed to a burning desire to consume that much more mobile data. As shown in our [previous analysis](#), operators with bucket plans have generally been almost as quick to inflate those buckets as unlimited users have been to self-serve themselves to more data.

What makes operators with bucket plans so nervous that they themselves erode prices? Competition. Operators know that the best strategy to keep a customer is to *not* limit his/her data usage. This means that almost all operators – regardless of what they say – are on the “more for the same” track where **customer loyalty is more important than a few extra Euros**.

Conclusion

Mobile data usage is still growing in all of the countries covered by this analysis. The growth rates are very different and so are the usage levels. As usual, **Finland** tops the charts – with 11.3 GB per average SIM per month in the first half of 2017. But in spite of **60%** of non-M2M SIMs being **unlimited**, the data usage isn't particularly fast there. We added India and China to our analysis and whereas China's usage growth is quick, **India's** is rocketing. But also Lithuania, Romania, France, Turkey and Austria demonstrate rapid growth.

Our analysis shows strong correlation between the **data-only penetration** of a country's SIM base and the average data usage. **Austria** is together with **Finland** and **Australia** the data-only powerhouses of the world with about 20% penetration.



The **4G** share of total mobile data traffic has already effectively reached 100% in **Korea** even though the 4G adoption is less than that; 77%. The rest of the world is behind Korea in 4G adoption, but Korea's data usage isn't the highest. For other mature markets this means that the data usage upside by an increasing 4G adoption in itself is limited. Data usage could instead 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 **Finland, Latvia, Lithuania, Taiwan** and **Austria**. These countries are the Shangri-La for mobile data users.

Greece, Canada, Belgium, Germany and **Czechia** represent the opposite. The total revenue per gigabyte here is roughly 20 times higher than in Finland. And consequently, mobile usage is very low.

Low data usage doesn't necessarily mean that the ARPU is low, though. **USA** and **Canada** have the highest ARPU levels among the countries in our analysis and the Canadian consumers should be particularly unsatisfied with that – given how few gigabyte they can consume for that ARPU.



With the 'Christmas tree' visualisation we show how difficult "**more for more**" generally is. In 16 markets – Iceland, Denmark, Hong Kong, the Netherlands, Singapore, Portugal, Spain, Austria, Korea, Taiwan, Ireland, France, Lithuania, Australia, Hungary and the UK – **ARPU declined** in the first half of 2017 even though the data usage increased.

Only in five markets – Turkey, Japan, Sweden, Finland and Norway – ARPU increased on the back of an increase in data usage.

We will shortly follow this country-focused analysis up with [another one](#) focused on operators. It will highlight the operators that are successful in implementing "more for more", bucking the generic "more for less" trend observed here.

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