

Industry analysis #1 2017

Mobile data – full year 2016

“More for more” isn’t happening

Cherish “more for the same” – it’s the best you get



This is tefficient’s 15th public analysis on the development and drivers of mobile data.

The usage continued to grow in 2016, but the spread in growth rates has never been greater between markets. Singapore, Japan, Hong Kong and, surprisingly, USA grew the slowest whereas Poland, Lithuania, Romania, Austria and France grew the fastest.

In Poland, Lithuania and Austria premium unlimited plans were introduced in 2015 and 2016 and the effect on data usage has been similar to what our previous analyses identified for Finland, Latvia and Korea.

High penetration of data-only SIMs drives high data usage to a greater extent than 4G LTE. Austria is the new world leader in data-only penetration, whereas Korea still holds the 4G LTE crown. 4G is becoming a commodity in many other markets and even though a 4G subscription still consumes more data, the difference is now smaller than it used to be.

The effective revenue per gigabyte is what matters the most for usage: In Finland, average usage per SIM was 18x that of Belgium – where operators' revenue per gigabyte was 16x that of Finland. Other expensive mobile data countries are the Netherlands, Germany, Czech Republic and Hungary¹.

This analysis focuses on 33 countries. We will issue a separate public analysis that compares the mobile data traffic of mobile *operators*: <http://tefficient.com/the-luxury-of-the-commodity-gigabyte/>

¹ Canada and Greece would still likely qualify as expensive, but the regulators have not yet reported stats for 2016

Data usage spans from 0.5 to 8.3 GB per SIM per month

Figure 1 shows the development of mobile data usage for 33 countries where regulators² report mobile data traffic.

The top three countries of the world based on full year 2016 stats are **Finland**, **Taiwan** and **Latvia**. Four countries – **Sweden**, **Austria**, **Korea** and **Denmark** fight for a fairly distant fourth place.

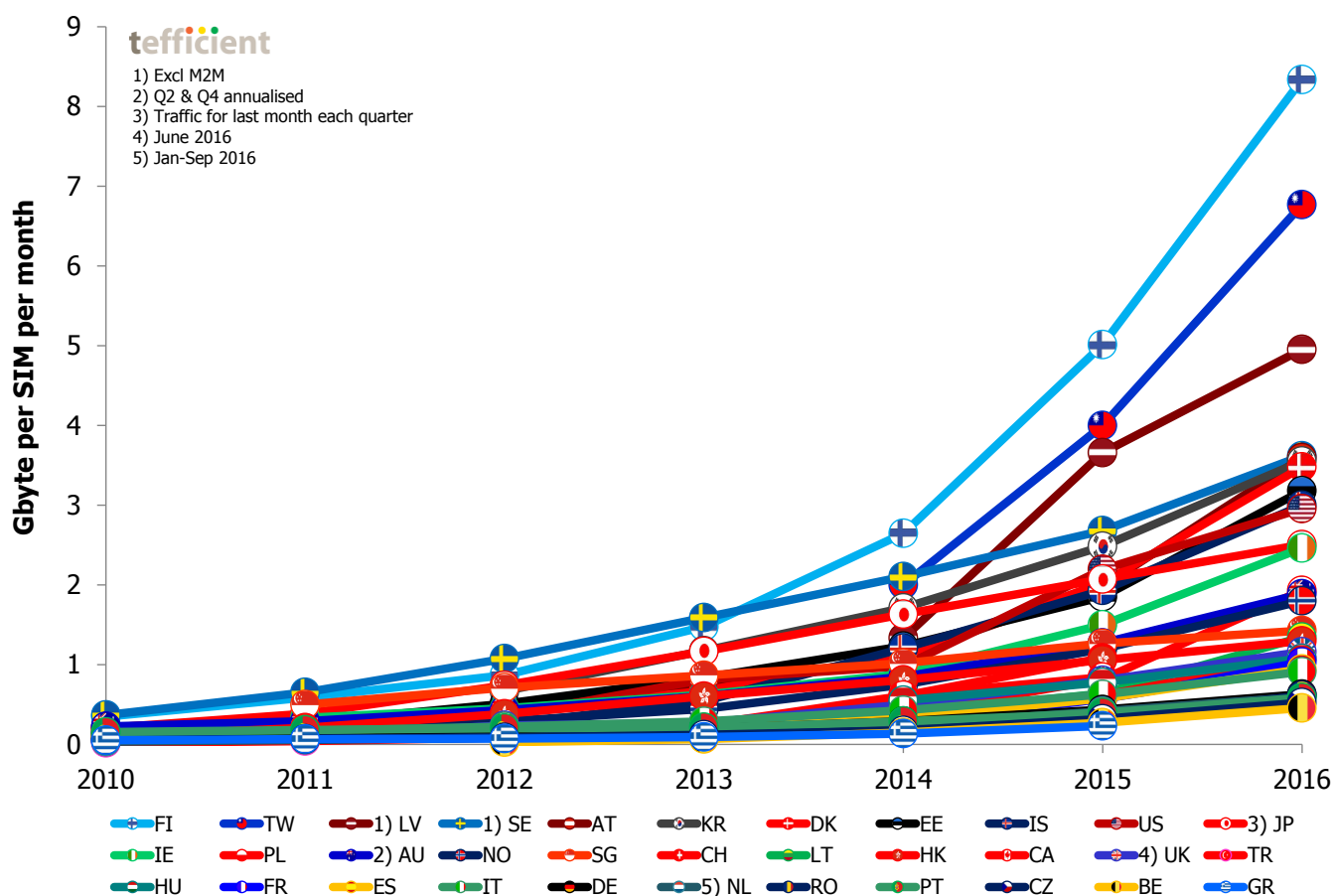


Figure 1. Development of mobile data usage per SIM per country



With **8.3 GB** per month per SIM (of any kind, including M2M), **Finland** continues to lead the world in usage. A majority of Finnish SIMs – **54%** – had **unlimited data volume** in December 2016: Monetisation in Finland is effectively based on throughput tiers and not on volume.

² Exception: USA, where data is from industry body CTIA



Taiwan has not been on our radar until recently and has consequently not featured in our previous analyses. **T Star** and **GT**, both challenger operators (GT with CDMA background), got the three incumbent mobile operators – Chunghwa, Taiwan Mobile and FarEasTone – to jump on the unlimited bandwagon. Taiwan was late with 4G LTE, but the penetration has increased very rapidly, driven by unlimited propositions at very low price points. Even though the incumbent operators are now backing away from their initial, copycat, propositions, making unlimited more expensive again, the data usage in Taiwan skyrocketed in 2015 and 2016. The monthly usage per SIM in 2016 was **6.8 GB**.



The usage growth in **Latvia** (to **5.0 GB**) wasn't as fast in 2016 as it was in 2015 when unlimited plans were first introduced. The Baltic country still has plenty of air between itself and the block of Sweden, Austria, Korea and Denmark, though.

The legend of Figure 1 is showing the ranking of the 33 studied countries³. Since it's admittedly difficult to see all countries, Figure 2 is showing the ranking based on full year 2016 data.

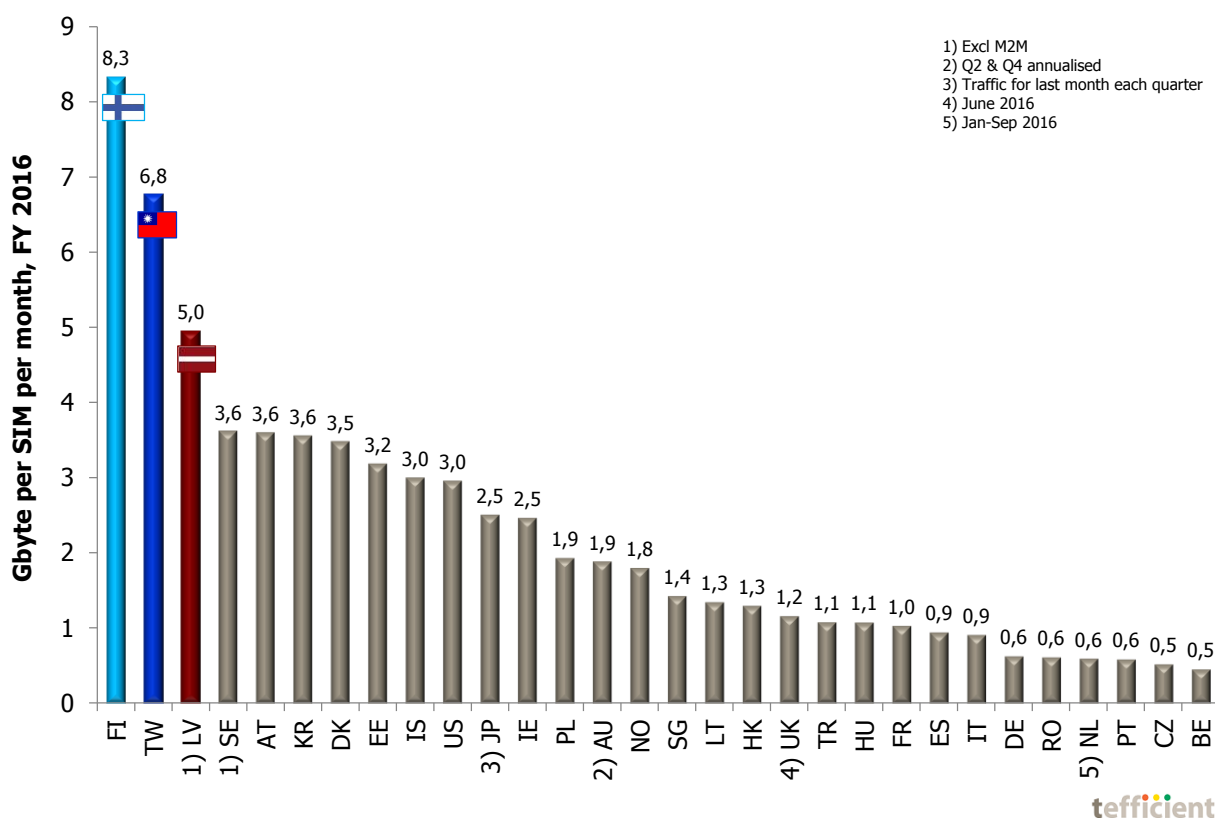


Figure 2. Mobile data usage per SIM per country, full year 2016

³ No 2016 stats for Switzerland, Canada and Greece

The countries with the lowest mobile data usage in 2016 are **Belgium, Czech Republic, Portugal, the Netherlands, Romania and Germany**⁴. To visualise the development also for the lowest usage markets, Figure 3 gives a zoom-in on Figure 1.

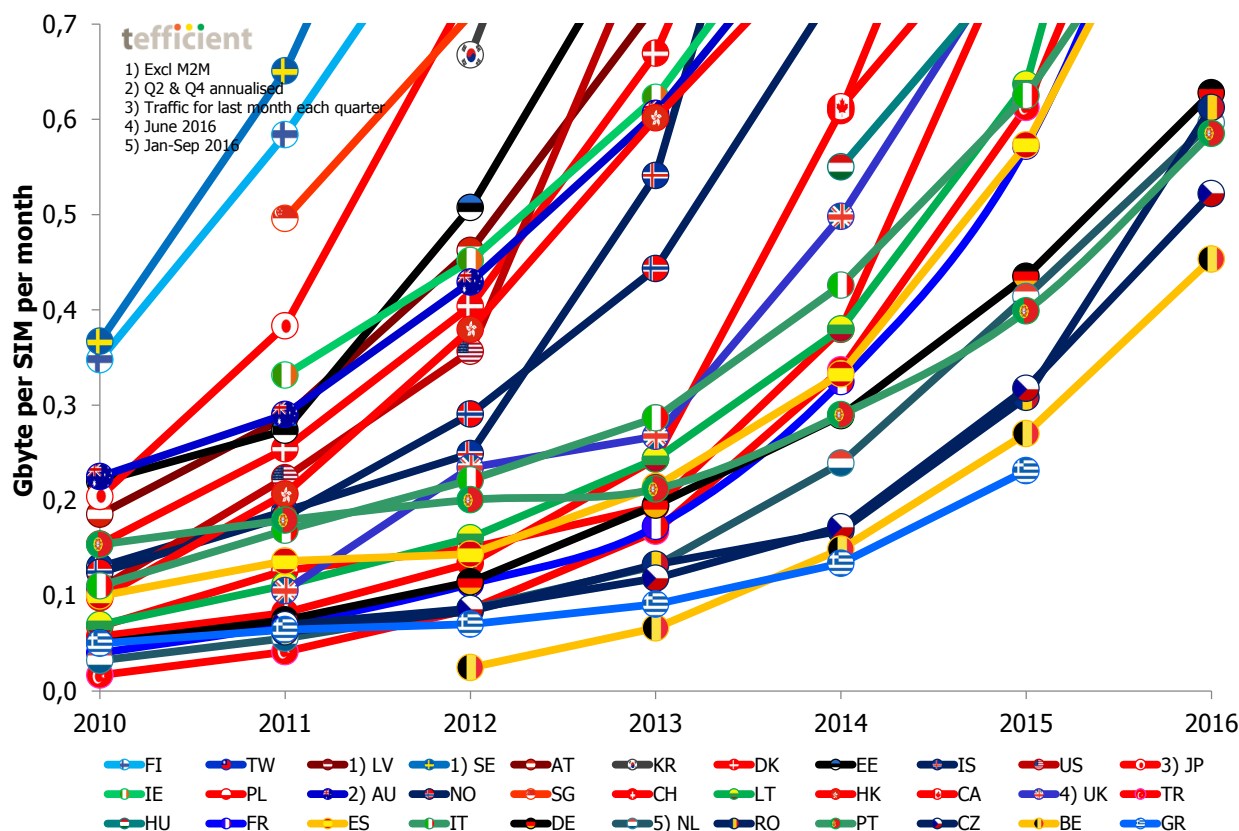


Figure 3. Development of mobile data usage per SIM per country – zoom-in on lowest usage countries

It took Belgium, Romania and Czech Republic **six years** to pass the 2010 data usage of Sweden and Finland. Is it correct to think that the low-usage countries are catching up so that the world one day will have the same average data usage?

⁴ Greece would likely also fall in this category, but no data for 2016 is yet reported

Data usage growth spans from 13% to 137%

To answer the question, let's first look at Figure 4 showing the one-year trend from 2015 to 2016.

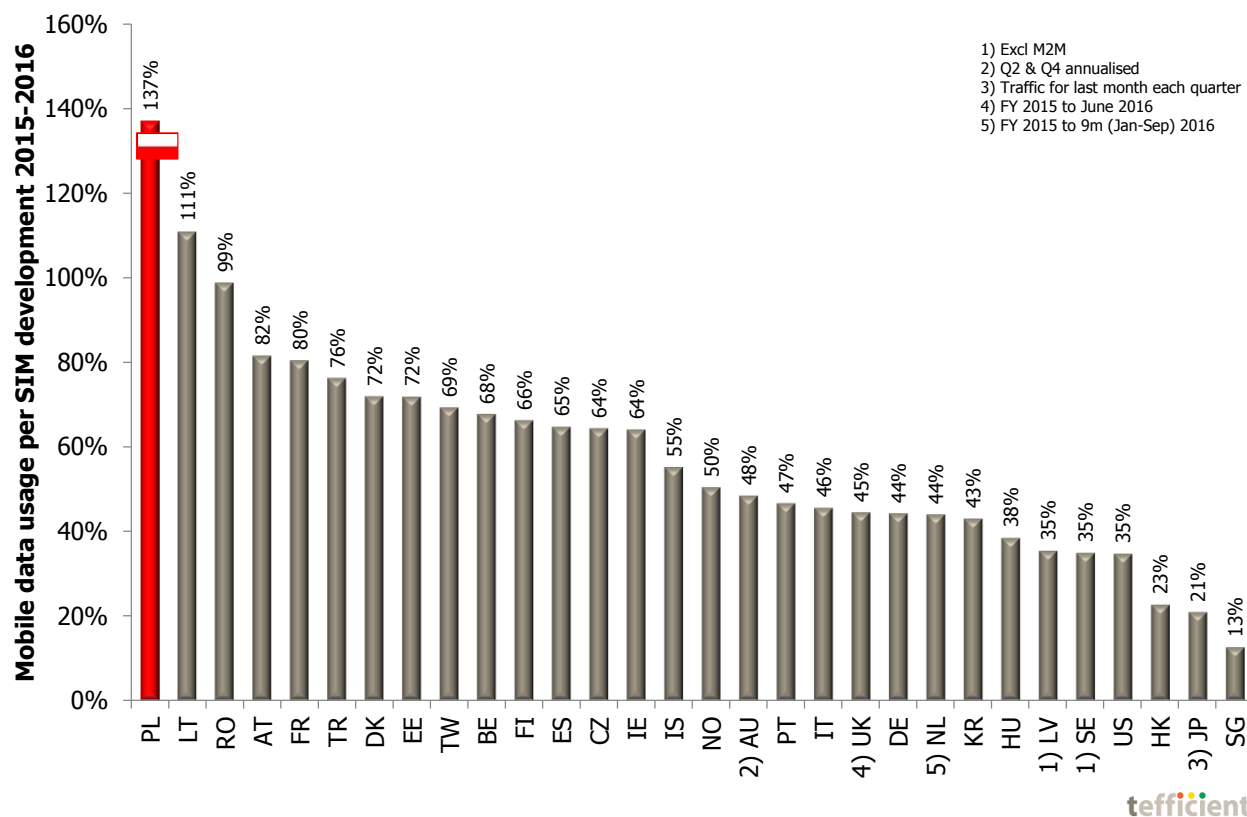


Figure 4. Development of mobile data usage per SIM 2015-2016 per country

Poland had the fastest growth in average mobile data usage in 2016. Poland's track record is unparalleled:

- 2014: +96%
- 2015: +115%
- 2016: +137%

This growth should, in large, be attributed to the two operators **Plus/Cyfrowy Polsat** and **Play** (see image) that introduced data-only subscriptions with very high or unlimited data volumes – and in parallel provided smartphone plans with generous allowances.

Lithuania had the second highest growth rate: +111%⁵. Also here,

39,99 zł abonament	49,99 zł abonament	59,99 zł abonament
Internet przenośny do 1 urządzenia	Internet przenośny do wielu urządzeń	Internet domowy do wielu urządzeń
50 GB bez limitu GB przez 6 mies.	50 GB bez limitu GB przez 6 mies.	Bez limitu GB
PLAY now Pakiet mini na 1 urządzenie	PLAY now Pakiet mini na 2 urządzenia	PLAY now Pakiet podstawowy na 1 urządzenie

⁵ This excludes Mezon that currently is changing its data-only proposition from Wimax to TDD-LTE. The Lithuanian regulator started to report this traffic Q1 2017, suggesting that the average usage per Lithuanian SIM for 2016 (as shown in this analysis) would be higher

premium unlimited propositions play a role: All three operators, Tele2, Telia and Bite, are currently trading them.

Of the markets covered here, **Romania** and **Turkey** are perhaps the least mature and it's therefore not a surprise to see that their data usage is growing fast – from a relatively low level. The growth in **Austria**, **Denmark**, **Estonia**, **Taiwan** and **Finland** is more unexpected – since the data usage level was high to begin with. This is visualised in Figure 5 which plots data usage growth rates vs. the usage level.

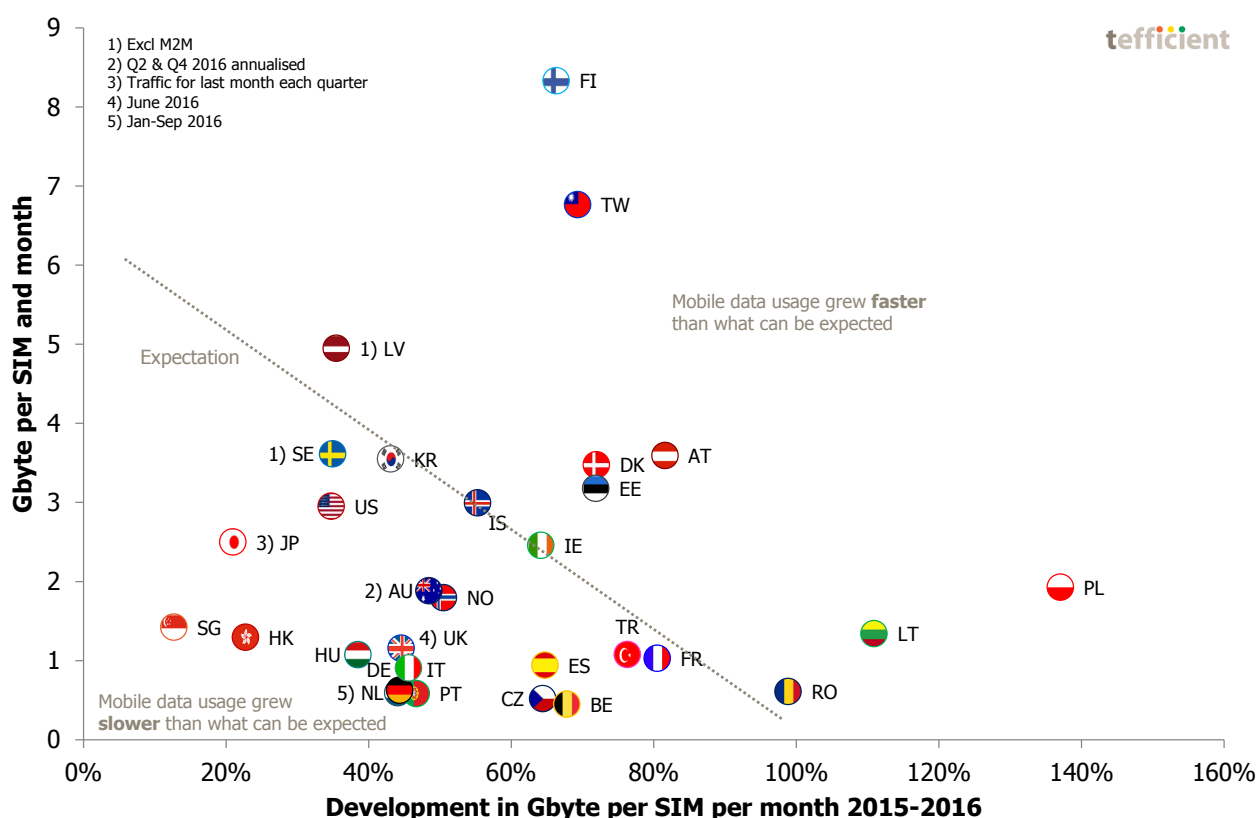


Figure 5. Mobile data usage 2016 vs. its development from 2015

In **Austria**, all operators ('3', T-Mobile and A1, see image) are now offering *data-only* home plans with unlimited data volume – with tiered price depending on selected maximum data throughput.

Offered as a fixed-line replacement, these plans have quickly become popular and Austria is now the country with the highest penetration of data-only in the SIM base – more about this soon.

300	150	80	40	20
300 Mbit/s Net Cube-Internet XL	150 Mbit/s Net Cube-Internet L	80 Mbit/s Net Cube-Internet H	40 Mbit/s Net Cube-Internet S	20 Mbit/s Net Cube-Internet XS
€ 19,90 / Monat € 99,90 ab dem 4. Monat	€ 19,90 / Monat € 99,90 ab dem 4. Monat	€ 19,90 / Monat € 44,90 ab dem 4. Monat	€ 19,90 / Monat € 32,90 ab dem 4. Monat	€ 19,90 / Monat € 25,90 ab dem 4. Monat
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We already touched upon unlimited in Finland and Taiwan. Following Latvia and Lithuania, the Baltic neighbour **Estonia** has also seen unlimited propositions being introduced; two of three operators (Tele2 and Elisa) are currently offering this. In contrast, **Denmark** doesn't – with the exception of one MVNO (Plenti) – have any unlimited data propositions. The Danish data buckets have, however, traditionally been very large – especially when considering the price – so many Danes have been able to consume more data without paying more. We'll come back to this soon as well.

Where is the appetite for more data **the lowest** then?

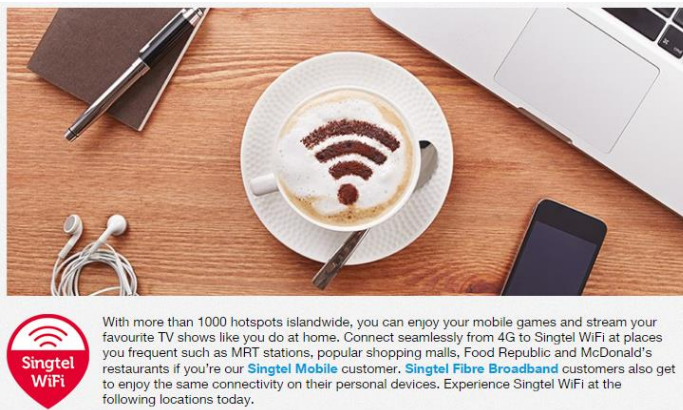


Figure 4 and 5 show that the mature Asian markets – **Singapore, Hong Kong and Japan** – have the lowest growth in data usage. In Singapore's case it's as low as 13%. Both Singapore and Hong Kong are essentially city markets and operators such as Singapore's Singtel and '3' of Hong Kong have done much lately to expand its public **Wi-Fi** networks – '3' Hong Kong had 25000 Wi-Fi hotspots in December 2016 while Singtel (left) had 1000. At the same time, operators have improved its EAP-SIM auto-offload functionality so that

higher volumes of traffic are carried over Wi-Fi. This might contribute to these low growth figures.

Data-only max 20% of base, but defines usage

The bigger the screen, the higher the data consumption – right? Figure 6 gives strong support for this.

Generally speaking, countries with a high penetration of **data-only SIMs** – sitting in e.g. tablets, PCs, modems – have much higher data usage than countries with a low data-only penetration. With 19.9% of SIMs being data-only, **Finland** has the highest data usage in the world. **Austria** has, however, passed Finland in data-only penetration with its 20.5% – even though the average data usage per SIM is lower.

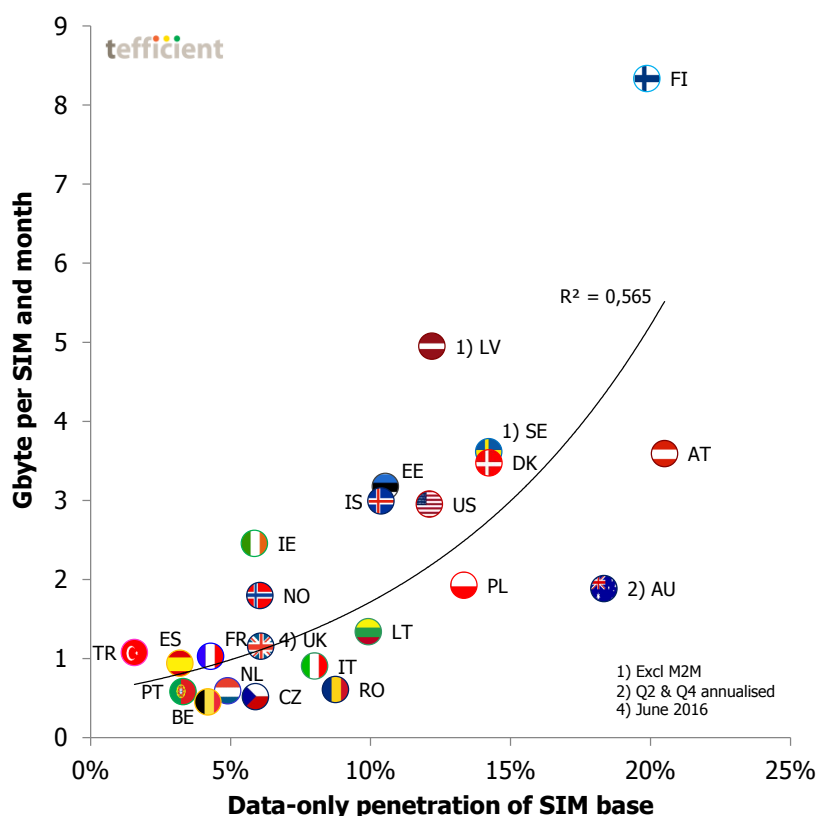


Figure 6. Mobile data usage vs. data-only penetration

If looking at the bottom-left corner we note that countries without a developed data-only market – **Turkey, Spain, Portugal, Belgium, France** and the **Netherlands** – all experience low average usage. To grow, it would make sense for someone in these markets to start addressing and monetise the data-only segment.

Nine of the countries in Figure 6 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 7.

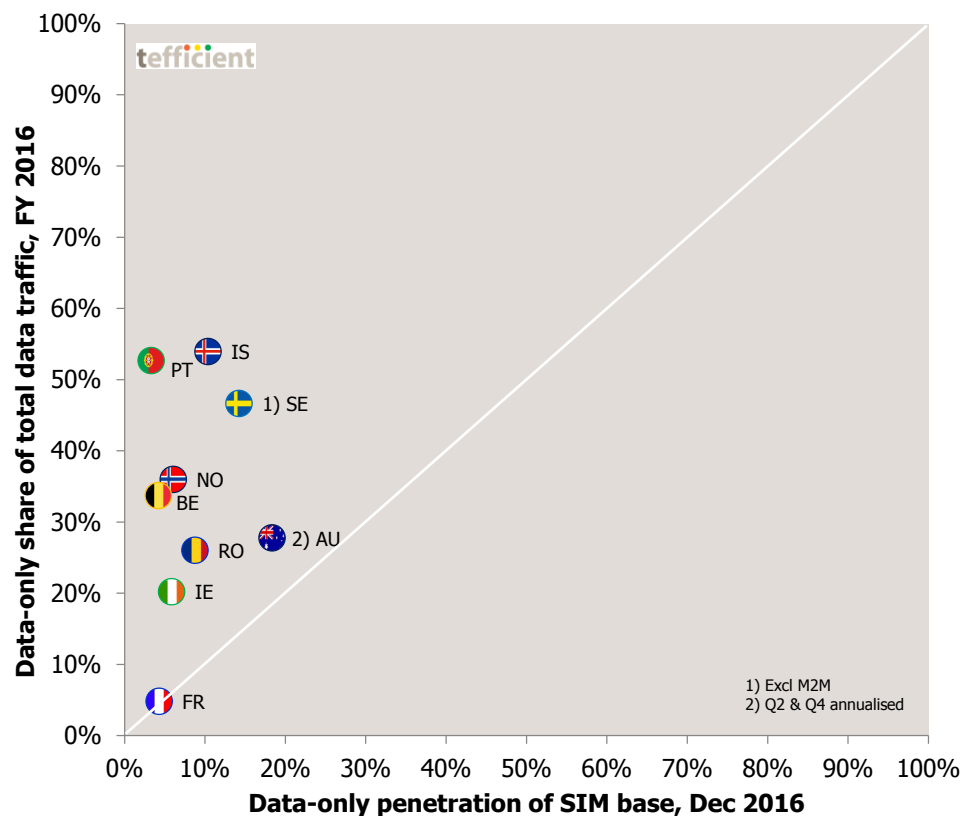


Figure 7. Data-only share of total traffic vs. data-only penetration

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

- Portugal **15x** higher traffic per data-only SIM vs. any SIM
- Belgium **8x**
- Norway **6x**
- Iceland **5x**
- Ireland **3x**
- Sweden **3x**
- Romania **3x**
- Australia **2x**
- France **1x**

4G adoption a less obvious driver of data usage

Three things are required to be an active 4G LTE user:

1. A 4G LTE capable device
2. A subscription that supports 4G LTE
3. 4G LTE coverage

Maybe because of this complexity, not all regulators report 4G LTE adoption. An attempt to correlate it with data usage is done in Figure 8 below.

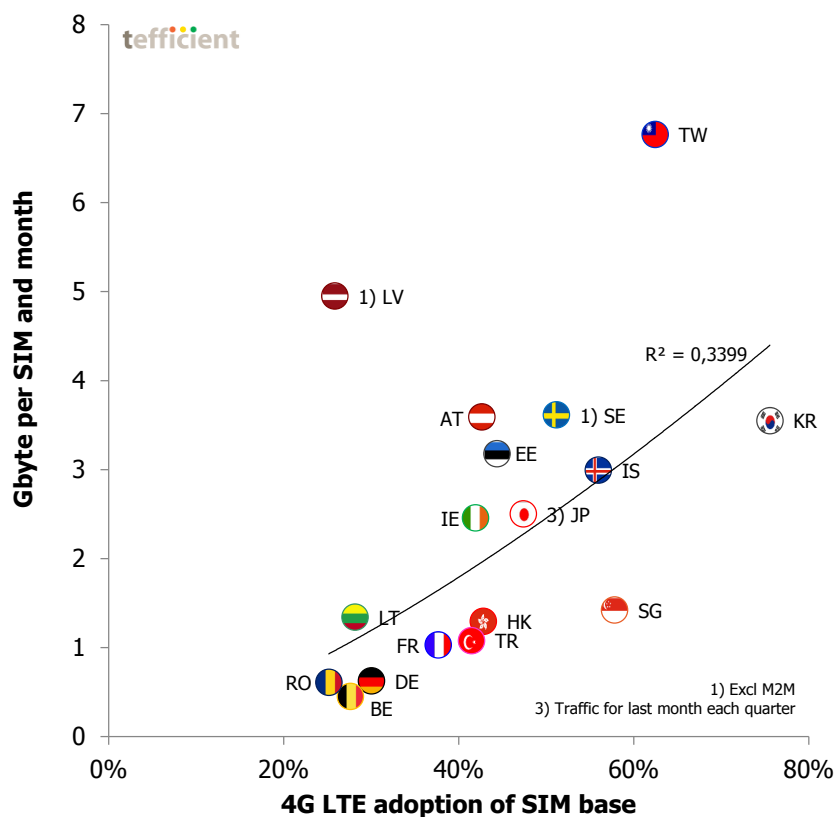


Figure 8. Mobile data usage vs. 4G LTE adoption

The R^2 value is – compared to data-only (Figure 6) – lower. **Korea** has the world's highest 4G LTE adoption (76%) but its data usage is no higher than e.g. Austria with 43% adoption or Sweden with 51%. Yet bigger contrast to Taiwan (62% 4G adoption) and Latvia (26%) that both have higher data usage than Korea.

If we consider Latvia an outlier, it seems as if a relatively high 4G adoption is anyhow somewhat of a hygiene factor for high data usage: The countries with the lowest data usage – Belgium, Romania and Germany – also have very low 4G adoption.

Nine of the countries in Figure 8 are also reporting the 4G LTE traffic. For these countries, we can compare the 4G LTE adoption of the SIM base to its share of the total mobile data traffic, see Figure 9.

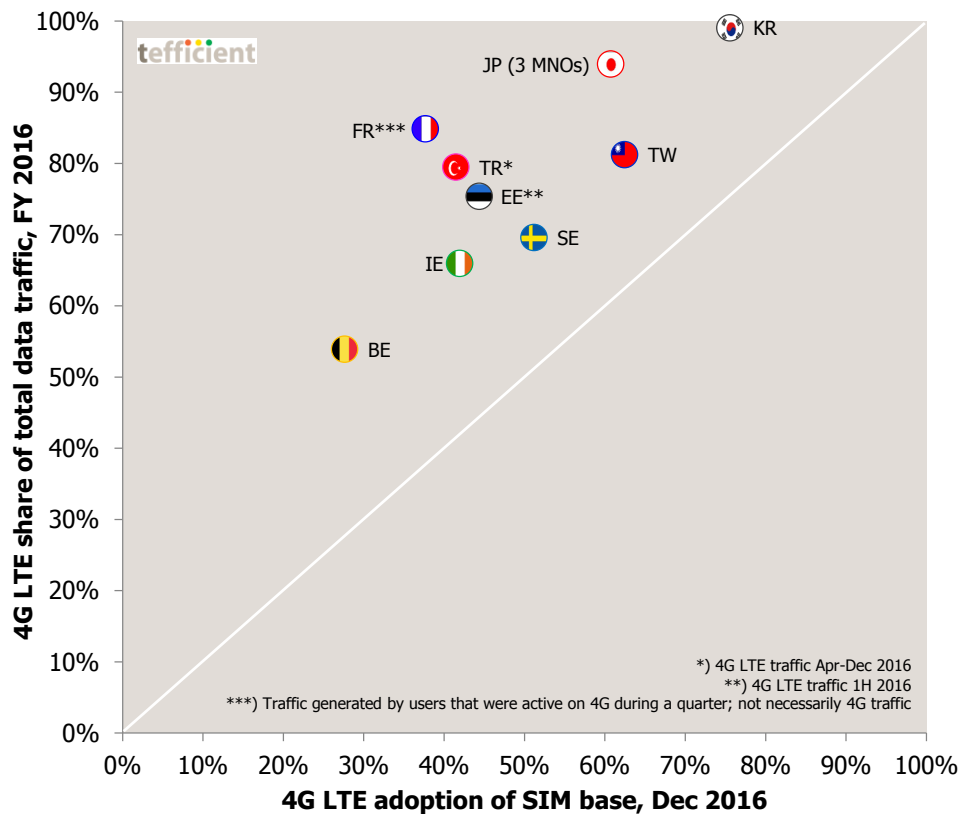


Figure 9. 4G LTE share of total traffic vs. 4G LTE adoption

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

- France **2.3x**⁶ higher traffic per 4G LTE user vs. any SIM
- Belgium **2.0x**
- Turkey **1.9x**
- Estonia **1.7x**
- Ireland **1.6x**
- Japan **1.5x**
- Sweden **1.4x**
- Korea **1.3x**
- Taiwan **1.3x**

⁶ 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

If comparing with Figure 9 it is clear that as the 4G LTE multiplier drops with an increasing 4G LTE adoption. It is, in other words, when 4G LTE still has relatively low adoption – like in Belgium, France and Turkey – that it makes a difference for the overall data usage. Once 4G LTE has become more common, the effect of the early adopters is watered out and the delta between a 4G LTE user and any SIM becomes smaller.

Data-only penetration is a much more significant driver of data usage than 4G adoption

Effective revenue per GB: What truly defines usage

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-triggering 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 plan⁷ – which means that it is still, essentially, about data volume.

Figure 10 plots the *total* mobile service revenue per gigabyte⁸ against the average mobile data usage per SIM per country.

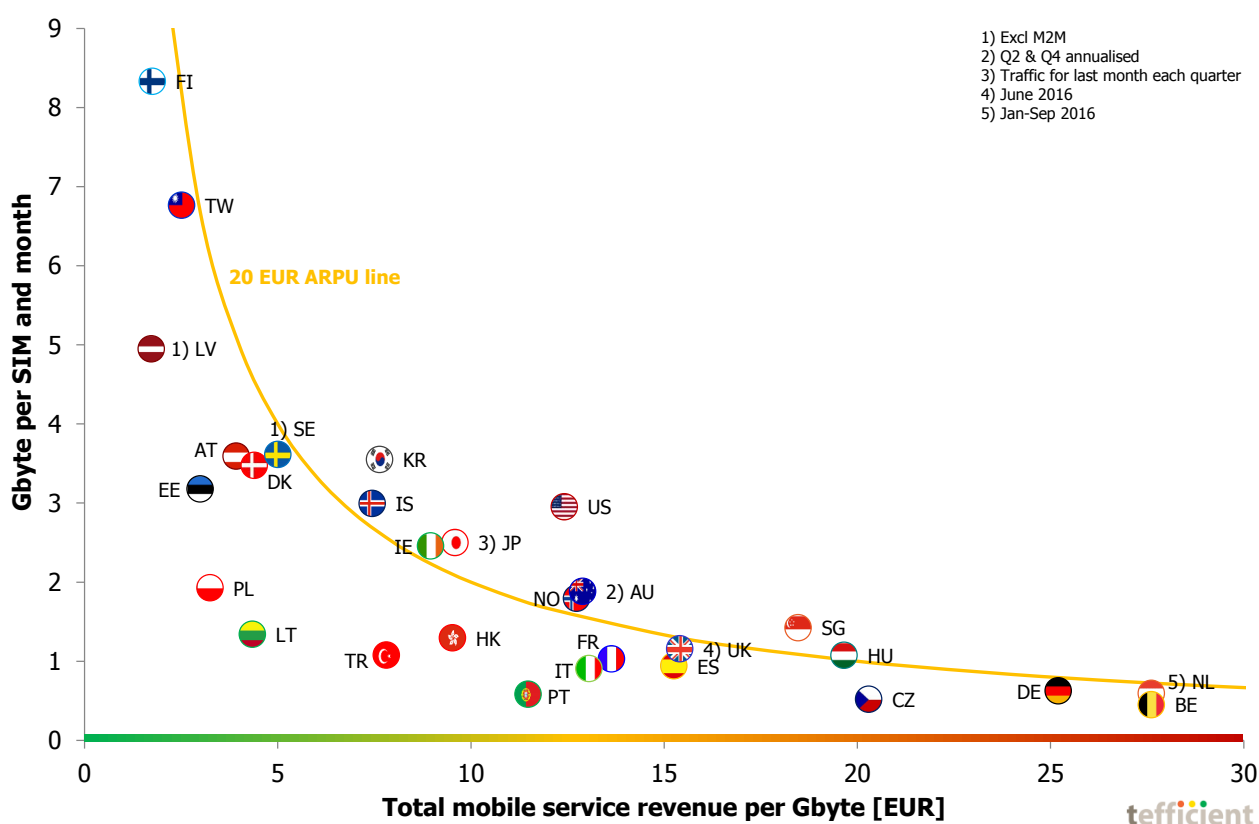


Figure 10. Mobile data usage vs. total mobile service revenue per Gbyte

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 three countries⁹ where operators effectively get very high revenue per consumed gigabyte: **Belgium**, the **Netherlands** and **Germany**. Even though operators in these countries since 2015 have

⁷ 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.

⁸ Attributing zero value to voice and messaging

upped data allowances, moderated punitive overage policies and lowered prices, it's clear that mobile users don't yet trust operators in these countries: The usage levels are still rock-bottom.

Also in **Czech Republic, Hungary** and **Singapore**, operators earn much per consumed gigabyte.

In the other end of the scale we find the country where operators have the lowest revenue per consumed gigabyte: **Latvia**. Also in **Finland, Taiwan, Estonia** and **Poland**, the effective revenue per GB is very low.

To exemplify the differences in data usage and revenue, the average usage per Finnish SIM was 18x that of Belgium – where operators' revenue per gigabyte was 16x that of Finland.

Finland vs. Belgium:
18x the data usage
per SIM

Belgium vs. Finland:
16x the revenue per
gigabyte

Looking at Figure 10 we can conclude – as in all our previous analyses on this topic – that the key explanation for high mobile data usage is low effective revenue per gigabyte: **Bigger data buckets lead to lower revenue per GB – which increases usage**. At least when customers can use those big buckets also on data-only devices; see Figure 6.

⁹ Our previous reports showed that also Canada and Greece had very high revenue per Gbyte, but no 2016 data is yet reported for these countries

Only weak correlation between data usage and ARPU

Figure 11 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.

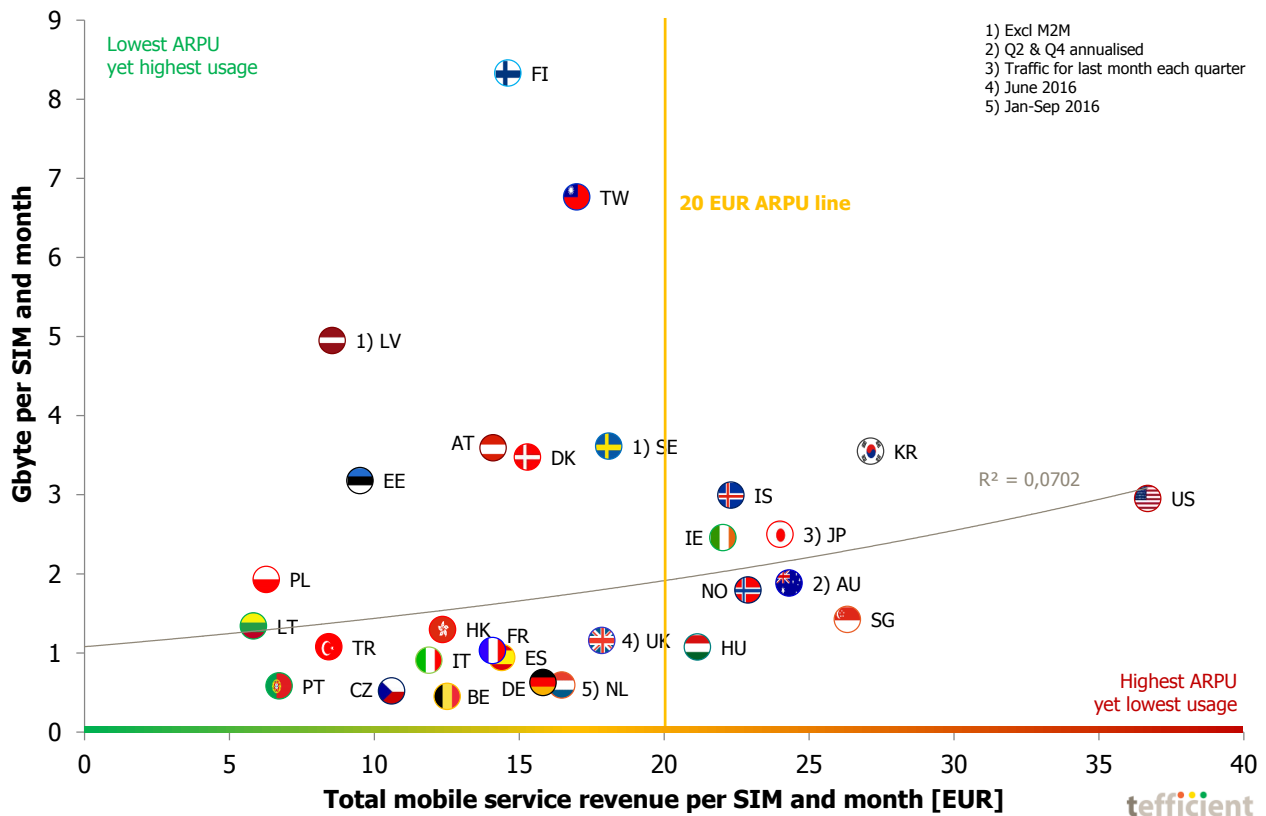


Figure 11. Mobile data usage vs. total mobile service revenue per SIM

In 2016, **USA** had the highest ARPU – 37 EUR – and **Lithuania** the lowest; 6 EUR. It would perhaps be logical to think that the higher the ARPU, the higher the usage – a customer who pays more also gets more – and even though the regression line is showing such a weak trend, the adherence to the line is very poor. This is disappointing of course – especially since many operators are expressing a “more for more” strategy.

In Figure 12 we are visualising the movements from 2015.

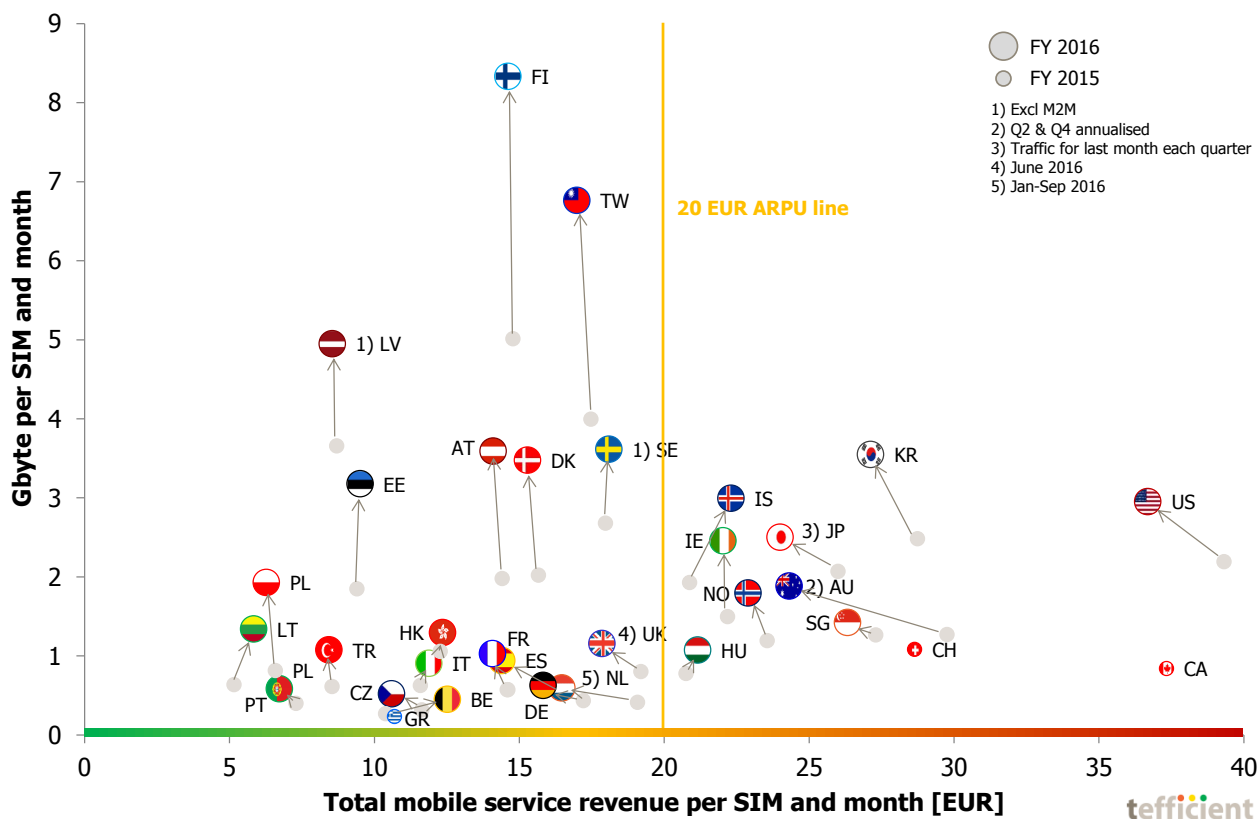


Figure 12. Mobile data usage vs. total mobile service revenue per SIM – with trends from 2015¹⁰

We need to point out that the graph is in Euro, but not all displayed countries have the Euro as their currency or have currencies that are coupled to the Euro. Still, few arrows point in a north-easterly “more for more” direction – with **Lithuania** and **Belgium** as the Euro exceptions: In these countries the ARPUs actually increased.

It’s rather so that most arrows point pretty much to the north – i.e. mobile users get “**more for the same**”. Even worse, in some countries like e.g. the Netherlands, Germany, Spain and France, mobile users get “**more for less**”.

The cornerstone in a “more for more” strategy is the ability to charge more for an increase in data usage, making customers buy top-up data or upgrade to more premium bucket plans. Figure 12 shows operators’ inability to do this.

Our next graph, Figure 13, shows just how fast the **erosion** in the total mobile service revenue per gigabyte has been in 2016. Here local currency is used throughout.

¹⁰ No 2016 data yet for Canada, Switzerland and Greece

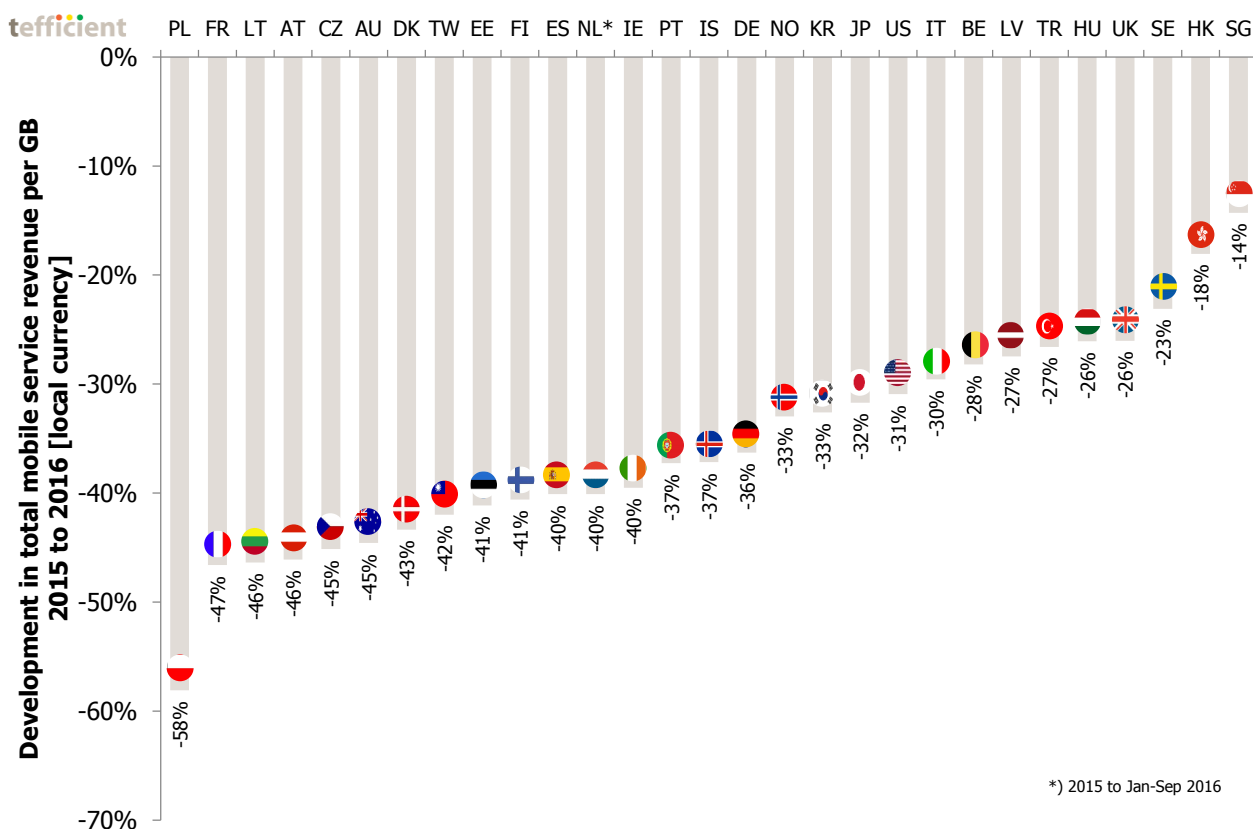


Figure 13. Erosion in total mobile service revenue per GB – 2015 to 2016

Poland, that also had the fastest growth in mobile data usage, had the fastest revenue erosion in 2016: 58%. If you identify Poland in Figure 12, you will though note that there has been almost no erosion in ARPU (in Euro). In essence, Polish mobile users have got “more for the same”.

Many operators have historically fiercely challenged the idea of unlimited mobile data volume, saying that data buckets and caps are required to secure “more for more”. Let’s then identify the countries where data buckets and caps are still the market norm – have “capped” operators actually experienced less revenue erosion?

In Figure 14 we have marked the capped countries **green**, the countries with some unlimited propositions **amber** and the country where unlimited dominate (Finland) **red**. Have in mind that the classification is based on what was available in 2016; certain countries like e.g. the Netherlands, Sweden and France have introduced unlimited only in 2017.

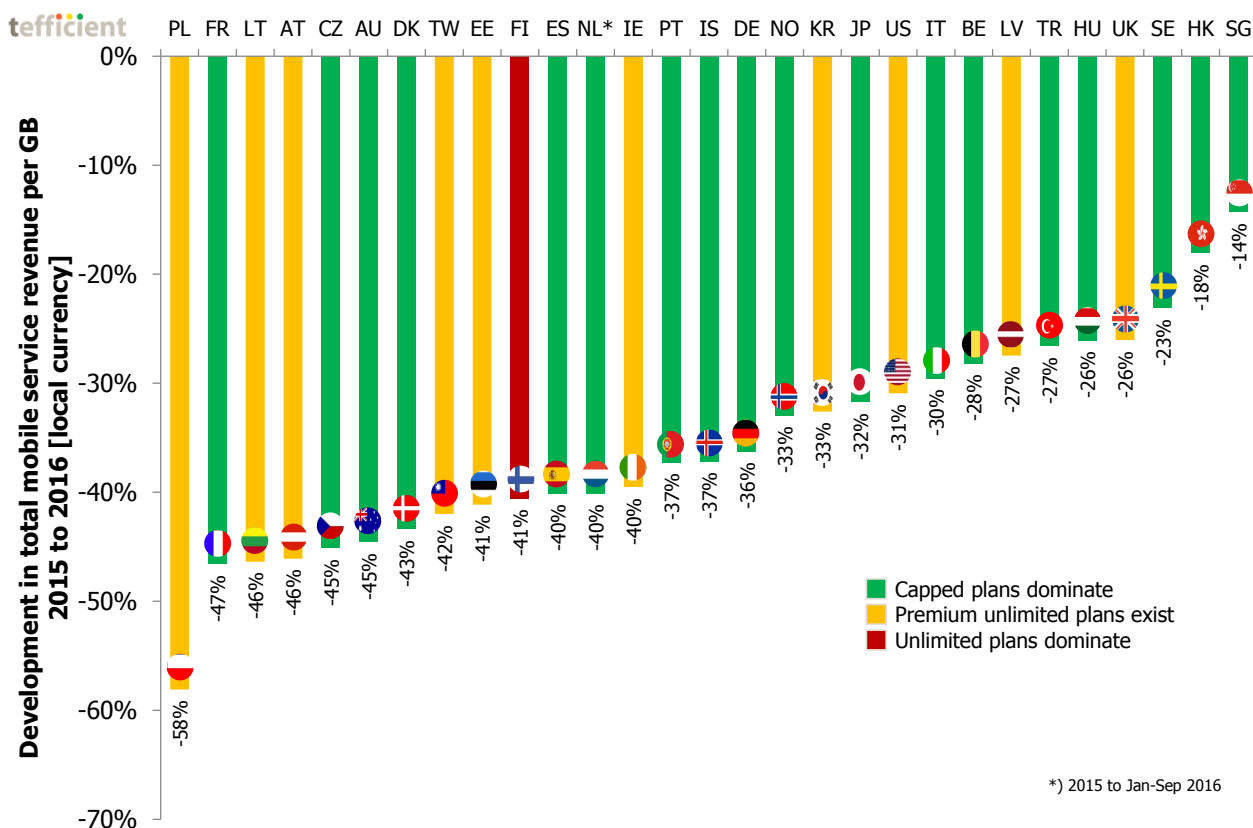


Figure 14. Erosion in total mobile service revenue per GB – 2015 to 2016 – with “degree of unlimited” shown

There is a tendency in Figure 14 that the countries with unlimited (red or yellow) have experienced faster revenue erosion than the capped countries (green). But it is also fair to say that **operators in capped markets are themselves eroding revenues** almost as fast as the (end-user incurred) erosion in unlimited markets. Capped operators are typically eroding revenues through free bucket expansions.

Why are then operators not cherishing their “more for more” strategy and forcing their customers to pay more if they use more data? Likely because 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. Our analysis finds that **growth is faster** in higher usage countries where operators have introduced **unlimited (or very generous) mobile data propositions**.



Even though the truly unlimited plan doesn't exist – operators limit throughput, tethering, video resolution, time or even volume – the **notion of unlimited** is sufficient for mobile users to change gear when it comes to data consumption. In our previous analyses, we have seen countries like Finland, Latvia and Korea doing this journey. Now we see other countries such as Poland, Taiwan, Lithuania, Austria and USA continuing it – and countries like the Netherlands, Sweden and France just commencing it.

Finland – where 54% of SIMs (incl. M2M) have unlimited data – continues to lead the world in mobile data usage. But Taiwan and Latvia are not having low usage either.

Our usage vs. revenue per gigabyte chart shows a significant spread in the revenue operators effectively get per GB. The most expensive mobile data countries are **Belgium**, the **Netherlands** and **Germany** and, consequently, mobile users in these countries are using very little mobile data. The average consumption in Finland is **18 times** that of Belgium.

The revenue per gigabyte is lowest in **Latvia, Finland, Taiwan, Estonia** and **Poland**. Our analysis shows that low revenue per GB is the primary driver for high mobile data usage. A high adoption of data-only SIMs is another driver whereas 4G LTE adoption has a weaker correlation with data usage.



The revenue erosion per gigabyte is fast. In all countries – without exceptions – operators get less revenue per gigabyte today than a year ago. But the effect on ARPU is not significant. Many operators are declaring “more for more” as their strategy, but the actual outcome speaks

against it being implemented. Operators in capped markets are *themselves* inflating the data buckets and *themselves* eroding their revenue per gigabyte. Our data show that this **operator-led revenue erosion is almost as fast as the user-led revenue erosion in unlimited markets**.

The reality is that – in competitive markets – an operator penalising customers that want to use more data risks losing them to competition. Regardless of what is being expressed, most operators in mature markets are on the “**more for the same**” track, not on the “more for more” track.

In a context where some of our studied markets have switched to the unfortunate “more for less” track, “more for the same” is actually not bad if customer churn can be sustained.

Our conclusion? Cherish “more for the same” – since it's the best you can get.

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