A Mobilesquared Analyst Briefing

A.S.P.I.R.

(A2P SMS Pricing Impact Report)

4Q 2023 update - public

Issue 2, January 2024

The Turbulence Begins

Outlining the potential impact high international termination rates are having on the A2P SMS landscape, and identifying which markets Mobilesquared believes present a fraudulent risk to brands and consumers.

A.S.P.I.R. is based on four key inputs from the A2P SMS industry:

- International termination rates
- Fraudulent traffic (based on Mobilesquared's rainbow model, incl.)
- Firewall deployments
- Exclusivity deals

A.S.P.I.R. is included as part of your Global A2P SMS annual subscription

Redacted version

Mobilesquared
Decision ready data

Disclaimer

Data and assumptions relevant as of 4Q 2023. Clients should independently verify any facts and figures as no liability can be accepted in this regard – clients assume full responsibility and risk accordingly for their use of such information and content.

Contents

Key findings

- Analysis of changes to the A.S.P.I.R. risk score reveal large increases between 2Q and 4Q 2023 in Africa, Asia, the Caribbean, and the Middle East, indicating a deterioration of market conditions in these regions, where the continued increases in international termination rates (ITRs) are attracting greater levels of fraudulent traffic, while conversely, having a detrimental impact on legitimate traffic volumes in effected markets.

- Based on the 4Q 2023 pricing data, Mobilesquared's A.S.P.I.R. model reveals that 26 of the 200 markets (13%) are now a high risk to brands and consumers and pose a greater threat of increased fraudulent SMS activity, with a further 26 markets (13%) also presenting a medium risk.

- The increase in ITRs has sparked a global contraction of international SMS traffic.

- Mobilesquared research reveals that the global disruption to the international SMS marketplace is being caused by the minority.

- The broader impact of the 52 medium- and high-risk markets, and excessively increased ITRs, is a global drop in international SMS traffic in 2023 by 9% based on previous projections.

- Based on the existing ITR per market, the lost traffic volumes account for a loss in revenue of several billion dollars.

- The average ITR in 4Q 2023 was $0.07076, an increase of 8.94% based on the 2Q rate of $0.06496.

- 390 mobile network operators' (MNOs) ITR was priced below the average rate, and 264 above the average rate. Over 10% of MNOs were priced 100% above the average rate, with 3.4% were priced over 200% higher.

- Africa experienced the greatest increase with the regional ITR up by 33.7% between 2Q and 4Q 2023. In relation to all other regions, this increase is indicative of an upward pricing trajectory which looks set to continue for the coming quarters and generate turbulent market conditions for the region.

- Mobilesquared believes the target ITR range for MNOs is between $0.03-$0.10.

- Azerbaijan has become the most high-risk market, followed by Tajikistan, Madagascar, Indonesia, and Russia. The growth in high-risk markets has come at the expense of no-risk markets which dropped from 63% of total markets to 49%.

- Mobilesquared predicts the forthcoming quarter to be equally turbulent, and will remain so until the ITRs start to drop significantly.

What is the A.S.P.I.R. model?

The purpose of the A2P SMS Pricing Impact Report (A.S.P.I.R.) is to outline the potential impact high international termination rates (ITRs) are having on the A2P SMS landscape in the short-term. In turn, we will outline which markets Mobilesquared believes present a heightened fraudulent risk to businesses and consumers in response to the increase in international termination rates and the likelihood that these developments will have an increase on existing fraud levels.

This is Mobilesquared's independent view of the marketplace based on insight, data, and information shared with us by the messaging ecosystem. Each quarter we will update A.S.P.I.R. with the latest international pricing data, to track how changes in mobile operator pricing are reflected in an increase or decrease in potential fraud.

Based on the data provided to Mobilesquared we have developed the A.S.P.I.R. model to monitor the A2P SMS marketplace by breaking out each market and mobile operator by whether our model places them in the "High Risk", "Medium Risk", "Low Risk", and "No Risk" category. While this is just a snapshot of the SMS landscape based on Mobilesquared data and insight, we would advise any brand sending SMS traffic into markets categorised as medium-risk and high-risk to do so vigilantly and conduct thorough research of their own to ensure their traffic is delivered successfully in a fraud-free environment.

The ITRs are central to the A.S.P.I.R. model, which requires four key inputs from the A2P SMS industry:

1. International termination rates / 2. Fraudulent traffic (based on Mobilesquared's rainbow model) / 3. Firewall deployments / 4. Exclusivity gateway deals.

It is imperative to note, that these remain very fluid times for the SMS industry with various elements in a constant state of flux. Mobilesquared is tracking these changes on a quarterly basis, to potentially highlight changes in the mobile operator's commercial model that will have a negative impact (and positive impact also) on both consumers and enterprise, by way of an increase in fraudulent traffic. The aim of the A.S.P.I.R. model is to generate the lowest score; the higher the score equals the greater propensity for fraud.

As our A2P SMS methodology is based on dealing with in excess of 300 companies operating within the SMS ecosystem, we cannot guarantee that we will always involve the same company, all of whom potentially hold a different viewpoint/data insight and so on, while researching A.S.P.I.R.. Therefore, we cannot guarantee that our sources will be consistent (especially from an international termination rate perspective), and this could result in unexpected fluctuations in A.S.P.I.R. on a quarterly basis.

Mobilesquared stresses that the above, along with market developments, can generate very profound changes in markets and mobile operators. Therefore, this report should be viewed as a reference document only and reflects Mobilesquared's market view at a particular moment in time.

This report will be published 4 times per calendar year, based on pricing data from the previous quarter.

Section 1

International termination rates

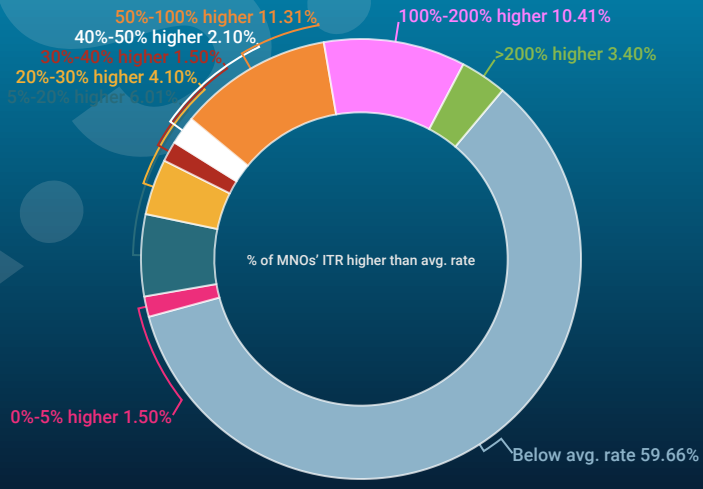
The period of uncertainty between 2021 to early 2023 for the international A2P SMS started to bite in the second half of 2023 creating a level of turbulence not seen before in this industry. To summarise, the global average international termination rate (ITR) continued to increase, and traffic volumes started to tumble in markets where the ITR was significantly higher than the average rate.

Due to the sensitivity of some of the data analysed in creating this report, Mobilesquared will only include top-level mobile network operator (MNO) insight; please note we will not share MNO pricing data and analysis, nor will any MNO be named in this report.

This report is based on 4Q 2023 MNO international termination rate data shared with Mobilesquared by the A2P SMS community.

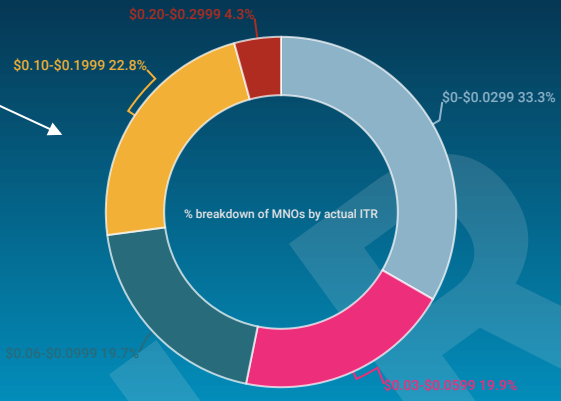
Section 1: International termination rates 4Q 2023

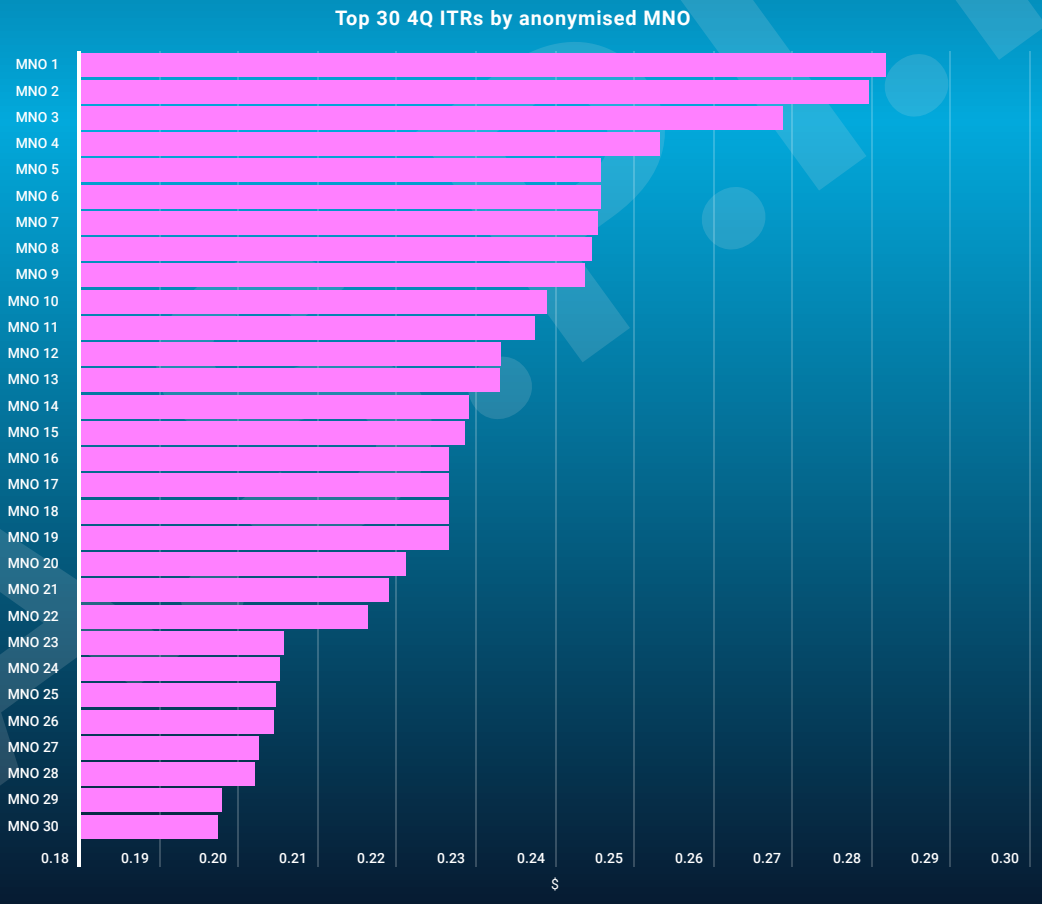
The average international termination rate (ITR) was $0.07076. The most expensive rate was $0.28156. Based on the 200 markets and 654 mobile network operators (MNOs) that Mobilesquared tracks, the data reveals that 390 MNOs' ITR was priced below the average rate, and 264 above the average rate. Of these MNOs above the average ITR rate, 164 were over 50% higher (i.e. their ITR was higher than $0.10614). Over 10% of MNOs were priced 100% above the average rate, with 3.4% over 200% higher.



If we break this down by actual rate, 218 MNOs were below the pre-mid-2021 rate of $0.03, 259 MNOs were priced between $0.03001 and $0.10, with 177 MNOs priced over $0.10001.

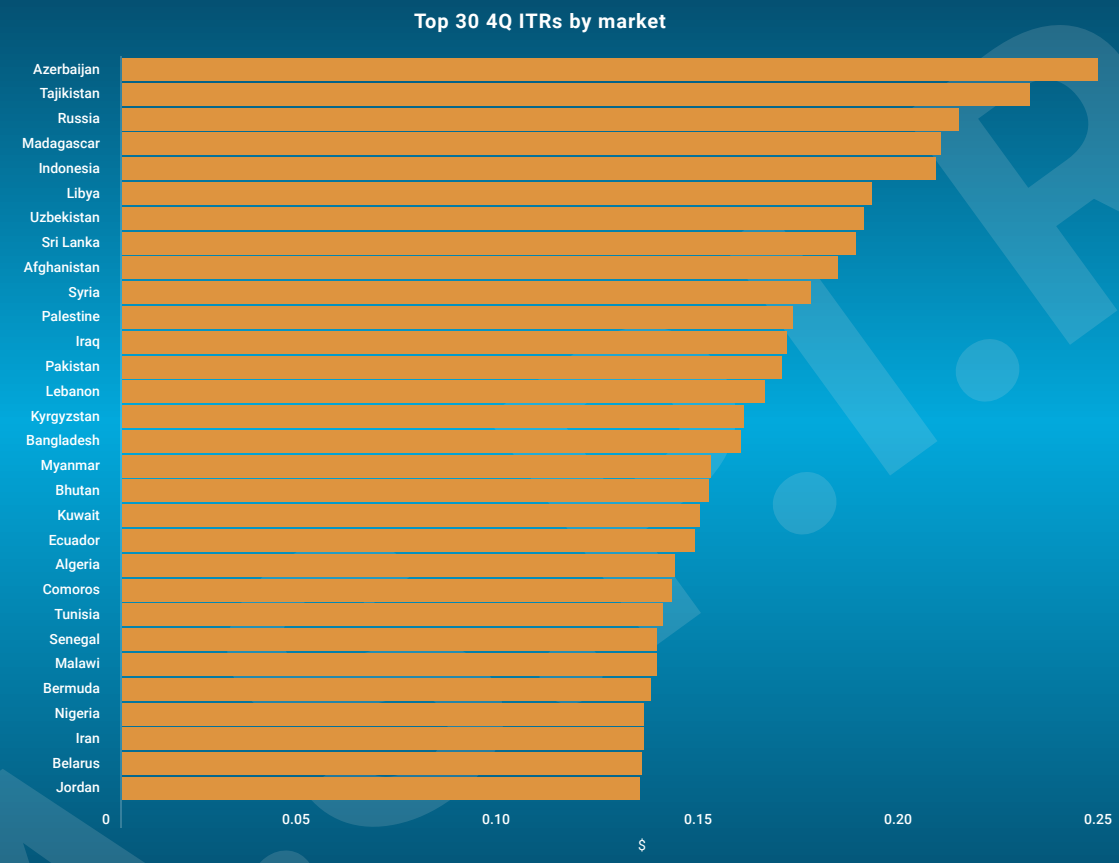
	Breakdown of MNOs by actual4Q ITR	% breakdown of MNOs by actual 4Q ITR
$0-$0.0299	218	33.3%
$0.03-$0.0599	130	19.9%
$0.06-$0.0999	129	19.7%
$0.10-$0.1999	149	22.8%
$0.20-$0.2999	28	4.3%





4Q ITR by market

When analysing the 4Q ITR pricing data by market, the most expensive market was Azerbaijan ($0.24334), followed by Tajikistan ($0.22645) and Russia ($0.20875). In total 88 markets were above the average global ITR, and 112 below. Based on actual ITRs, 5 markets were over $0.20, 46 markets priced between $0.10-0.1999, 99 markets priced between $0.03-0.0999, and 50 below $0.02999.



4Q ITR by region

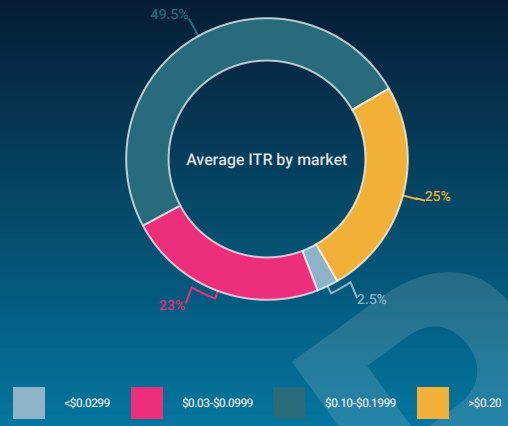
Based on the global average ITR rate, North America and West Europe had 100% of their MNOs priced below the average rate, 78.8% of MNOs in Latin America were below average, as were 72.2% of MNOs in Oceania and 67.9% in East Europe.

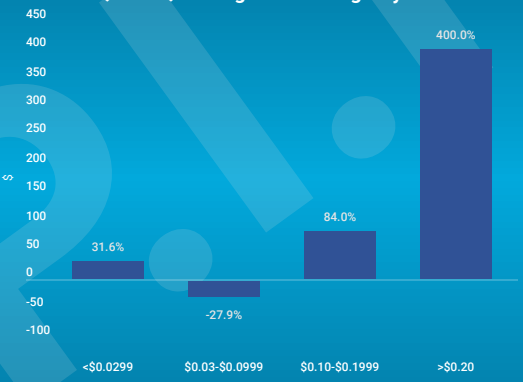
Conversely, the Middle East had 27.7% of MNOs priced below average, 40% in Africa, and around 50% for both Asia and the Caribbean. The Middle East led the way in terms of the percentage of MNOs pricing their ITR at 50% or above the average rate (49.94% of MNOs), compared to 39% in Asia, 34.8% in Caribbean, and 32.73% in Africa.

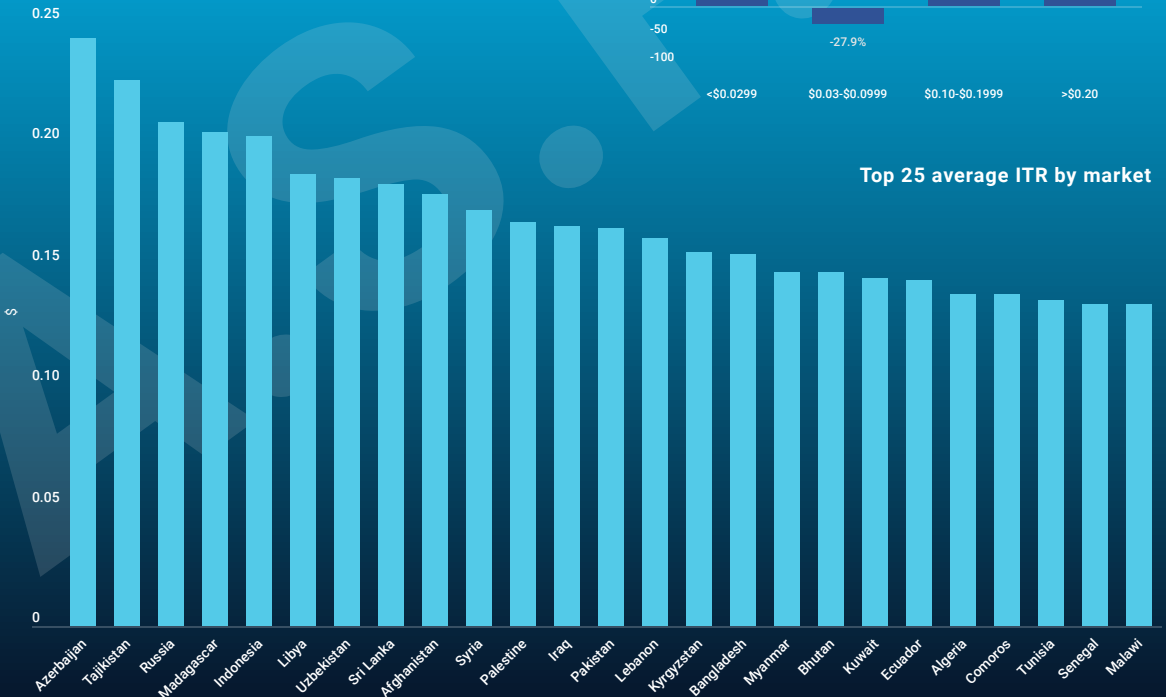
While it should be viewed as encouraging the fact that more MNOs decreased their ITR between 2Q and 4Q 2023, the increases that occurred during this period by MNOs negate the decreases, given that the global average ITR continues to increase.

Analysis of the 4Q ITR by market reveals that 88 markets were below average (compared to 89 in 2Q 2023), with 112 market above average. Five markets had an average ITR over $0.20 (Azerbaijan, Tajikistan, Russia, Madagascar, Indonesia), 46 priced between $0.10-$0.199, 99 between $0.03-$0.099, and 50 priced $0.0299 and below.

Since 2Q 2023, the number of markets with an average rate over $0.20 has increased by 400%, and the number of markets priced $0.10-$0.20 has increased by 84%. While the number of markets priced $0.0299 and under has increased 31.6%, the number priced between $0.03-$0.099 has fallen 27.9%. This indicates that MNOs in markets priced $0.03-$0.099 have adjusted their pricing strategy between 2Q 2023 and 4Q. MNOs in just 12 markets opted to decrease their rate, while 25 markets increased their ITR.





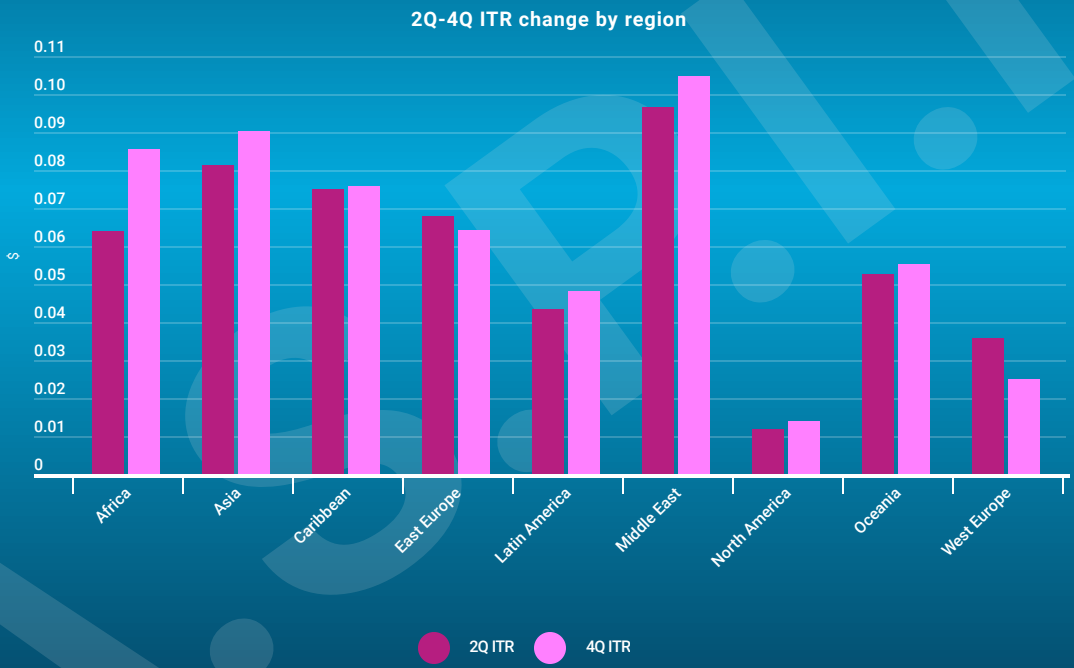


If we analyse the pricing data by region, it reveals that Africa experienced the greatest increase with the regional ITR up by 33.7% between 2Q and 4Q 2023. In relation to all other regions, this increase is indicative of an upward pricing trajectory which looks set to continue for the coming quarters and generate turbulent market conditions for the region.

North America experienced the second largest increase (17.8%) over the same period, although it should be noted that the revised rate remains substantially below the average global rate and the cheapest of all regions.

Asia, Latin America and the Middle East experienced increases of between 8%-11%, which suggests pricing in the regions is starting to stabilise, however, the high rates continue to be to the detriment of the markets in each region. The Caribbean appears to be approaching its peak rate, with an increase of just 1% the growth in the ITR is slowing.

As for Europe, East Europe's ITR dropped 5.5%, while West Europe's ITR fell 30%.



ITR pricing analysis

Mobilesquared research into A2P SMS pricing reveals two price points of interest. The general consensus from the messaging ecosystem is that A2P SMS rates should be capped at $0.10, regardless of the use case. Secondly, a number of hyperscalers believe that the per-message rate should be $0.05. Both figures are considerably higher than the pre-2021 average ITR rate of $0.03.

Mobilesquared believes that the acceptable ITR range for brands for an SMS is $0.03-$0.10, or given where the market is currently, this should be the target ITR range for those mobile operators charging above the ceiling rate for this price range. From an MNO and market perspective, there are 259 MNOs that fall within this rate range and 136 markets, 177 MNOs and 26 markets above this acceptable rate range, and 218 MNOs and 50 markets below the acceptable rate range.

By viewing the global market in this way, it highlights that around one-quarter of MNOs' pricing strategy is too high, and the same applies to around one-eighth of markets. While the overall market trend between 2Q and 4Q 2023 was to increase the ITR, leading to a deterioration in market conditions, looking at the bigger picture, the current period should be viewed as a price realignment for SMS.

International termination rate range of acceptability

The present pricing increases should be viewed as a COVID-delayed MNO response to market conditions pre-pandemic, when pricing was very much a "race to the bottom", with the Hyperscalers driving down the market ITR to unprecedented levels. Covid inevitably disrupted the A2P SMS market for a number of years, and what we are now observing is a significant number of MNO's apparently acting without a wider understanding of how their pricing strategy will affect their own business and the broader market.

The biggest concern for the A2P SMS ecosystem is that there is very little awareness of the price elasticity of SMS, including any demonstration of how the price increases will impact the market prior to their adjustment. What is becoming abundantly clear, is that A2P SMS is price elastic, and the market is now reacting accordingly to the price increase.

Section 2

Turbulence ahead

When Mobilesquared released its annual global A2P SMS forecasts in June 2023, 4 markets were set to experience a decline in international traffic in 2023, most notably Russia, which at the time had some of the highest ITRs globally. The same forecasts projected that by the end of 2026, 60% of markets (120 markets) would be experiencing a decline in international traffic. Much has changed since then.

As of January 2024, Mobilesquared believes the majority of markets experienced a decline in international traffic in 2023. The increase in ITRs has sparked a global contraction of international SMS traffic.

Our ongoing research into A2P SMS reveals that where MNOs have increased their ITR exponentially, traffic volumes in that market plummeted in the 2H of 2023, typically by up to 50% of traffic volumes where rates were significantly higher than $0.10. In these markets, the Hyperscalers limited or stopped sending SMS traffic, looking to use alternative channels to deliver their mission-critical communications.

A2P SMS international traffic projection revisions for 2023

One of the many resulting issues facing the SMS industry on the back of the market developments over the last 30 months, is that the Hyperscalers account for approximately 80% of total international traffic. And if they take their traffic elsewhere, it will have an astronomical impact on the marketplace.

The Hyperscalers' response to the high ITRs primarily started in 2Q 2023, and their revised SMS stance took full-effect in 2H2023, when traffic levels started tailing off in a lot of affected markets. So much so, that their decision to limit SMS usage looks to have impacted every market, creating a very turbulent environment for international A2P SMS.

Subsequently, Mobilesquared's revised traffic projection for 2023 has dropped by 9% based on its previous projection.

It is worth noting that 5 most expensive markets with an ITR above $0.20 as of 4Q 2023, only accounted for 1.42% of total international traffic in 2023. In fact, of all the markets with an average ITR higher than $0.10 as of 4Q 2023, their combined traffic only accounted for 4.79% of total international traffic. This means that the global disruption to the international SMS marketplace is being caused by the minority.

Section 3

The A.S.P.I.R. risk model

Defining A.S.P.I.R.

The full definition + methodology can be found on page 16.

A market that receives a score of +30% in the A.S.P.I.R. model is considered High Risk by Mobilesquared, with a higher-than-expected propensity for consumers to experience a negative interaction with a brand, and therefore placing the brand's reputation at risk.

A market that receives a score of 20%-29% in the A.S.P.I.R. model is considered Medium Risk by Mobilesquared, with a greater-than-average propensity for consumers to experience a negative interaction with the brand, and therefore placing the brand's reputation at risk.

A market that receives a score of between 5%-19% in the A.S.P.I.R. model is considered Low Risk by Mobilesquared, with a slightly elevated propensity for consumers to experience a negative interaction with the brand, and the same in terms of placing the brand's reputation at risk.

A market that receives a score of less than 4.99% in the A.S.P.I.R. model is considered No Risk by Mobilesquared, meaning there is no elevated propensity for consumers to experience a negative interaction with the brand based on normal traffic conditions; and the same in terms of placing the brand's reputation at risk.

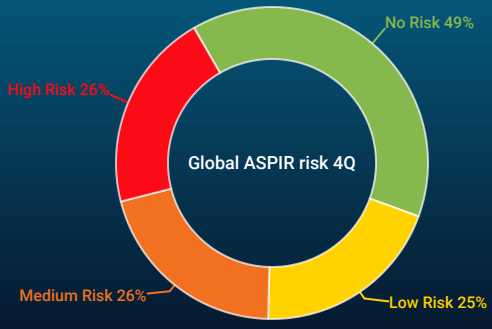
Based on the 4Q 2023 pricing data, Mobilesquared's A.S.P.I.R. model reveals that 26 of the 200 markets (13%) tracked by Mobilesquared presented a high risk to brands and consumers and the threat of increased fraudulent actiivty as of 4Q 2023, with a further 26 markets (13%) also presented a medium risk. Fifty markets (25%) presented a low risk, and 98 markets (49%) present no risk extended beyond normal messaging behaviour. In summary, 26% of markets presented a medium- and high-risk to brands and consumers, and 74% of markets presented a no- to low-risk.

Azerbaijan has become the most high-risk market, with an A.S.P.I.R. score of 62.8%, followed by Tajikistan (60.3%), Madagascar (54.4%), Indonesia (51.9%), and Russia (51.1%). The average A.S.P.I.R. score across the 26 markets that make up the high-risk category is 41.2%.

Twenty six markets make up the medium risk category. Senegal (29.5%), Bermuda (29.3%), Niger (28.6%), Malawi (27.9%), and Tunisia (27.19%) comprise the top 5 medium-risk markets. The average A.S.P.I.R. score across the 26 markets that make up the medium-risk category is 24.5%. The average A.S.P.I.R. score across the 50 low-risk markets was 12%, and for the 98 no-risk markets the score was -9.4%.

The region with the highest A.S.P.I.R. is the Middle East, followed by the Caribbean, Africa, and Asia. The Middle East is a low-risk region on the cusp of becoming medium-risk, which highlights that it is the region with the highest % of medium- and high-risk markets.

Global A.S.P.I.R. score



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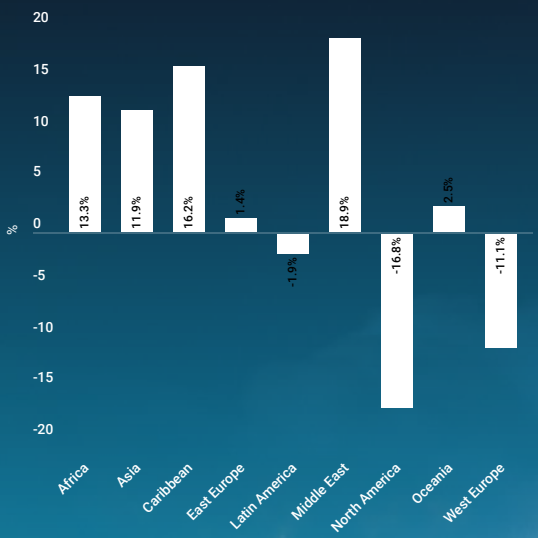
Average A.S.P.I.R. score, by region

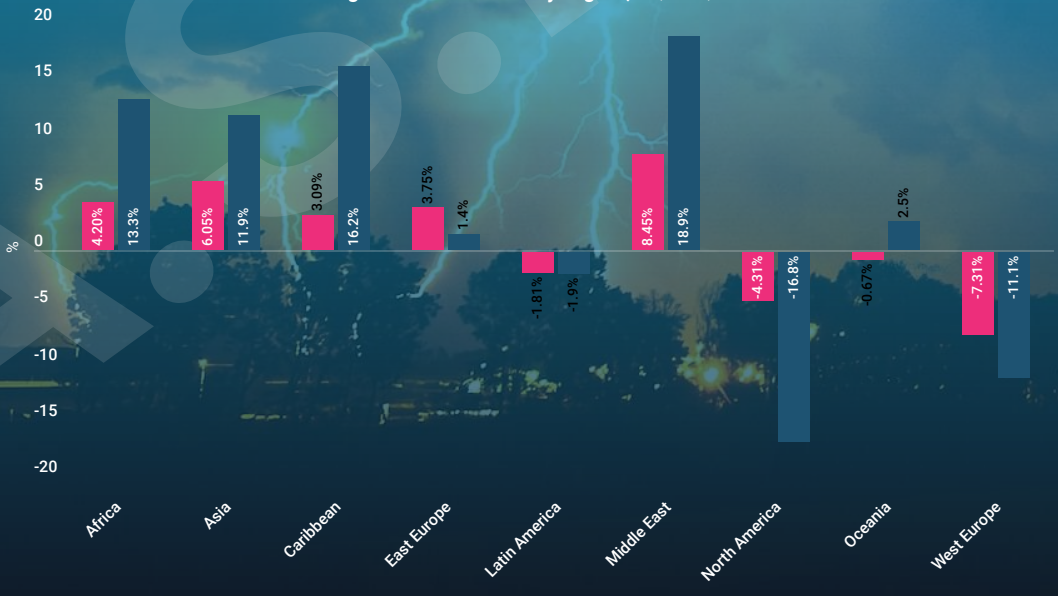


Between 2Q and 4Q 2023, the number of high-risk markets increased from 11 to 26, while the number of medium-risk markets experienced identical growth (from 11 to 26). This means the number of markets that pose a severe risk to brands and consumers more than doubled over the six-month period. This growth was at the expense of no-risk markets, which decreased from 63% to 50%, and contributed to the destabilising of the international SMS market in the 2H of 2023.

Although the share of low-risk markets remained unchanged, there was a significant shift in the number of markets in Africa that changed from no-risk to low-risk, indicating that market conditions look set to deteriorate across Africa in the coming quarters, with ITRs set to increase. The increase in high-risk markets primarily occurred in Asia and the Middle East.

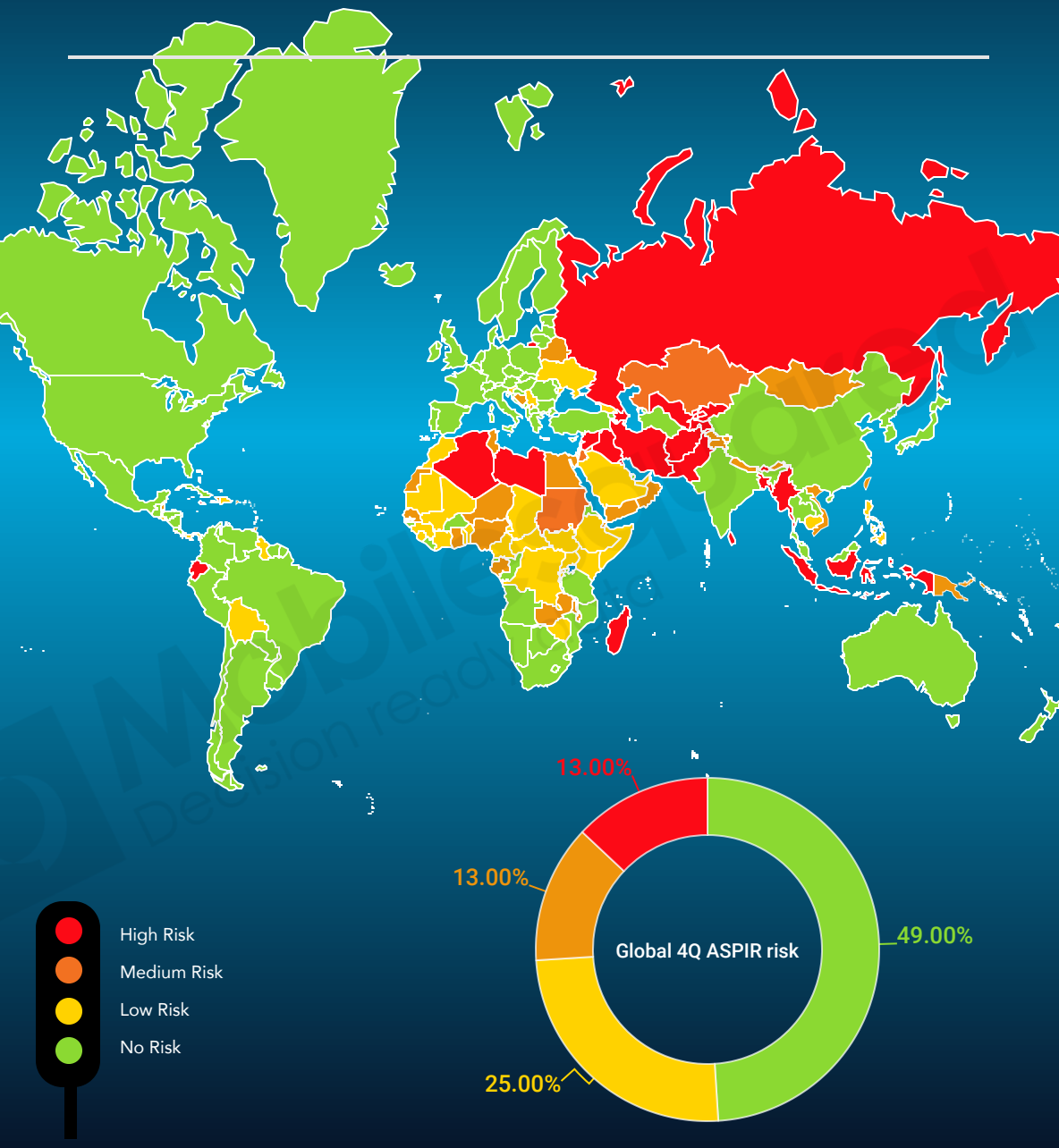
Analysis of changes to the regional A.S.P.I.R. score reveal large increases between 2Q and 4Q 2023 in Africa, Asia, the Caribbean, and the Middle East, indicating a deterioration of market conditions in these regions, with the continued increases in ITRs, likely to attract greater levels of fraudulent traffic, while conversely, having a detrimental impact on legitimate traffic volumes in effected markets. Where the A.S.P.I.R. score is negtive, fraud levels are unlikely to unduly change beyond the existing market conditions.

Average A.S.P.I.R. score by region, 2Q - 4Q 2023



Section 4

A.S.P.I.R. risk model, global



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The A.S.P.I.R. risk model explained

The A.S.P.I.R. model will determine whether each market (and mobile operator) should be viewed as a "High Risk", "Medium Risk", "Low Risk", and "No Risk", based on Mobilesquared data and analysis in response to the increase in international termination rates, and the likelihood that these developments will have an increase on the existing fraud levels already running in each market.

So how have we defined the Risks?

High Risk

A market (or mobile operator) that receives a score of +30% in the A.S.P.I.R. model is considered High Risk by Mobilesquared, with a higher-than-expected propensity for consumers to experience a negative interaction with a brand, and therefore placing the brand's reputation at risk.

High Risk can primarily be attributed to higher-than-average international termination rates (typically more than 100% or above the average market rate at that point in time), an abundance of exclusive deals, underperforming SMS firewalls resulting in high levels of fraudulent traffic.

Mobilesquared research has revealed that the combination of the above will not only drive Artificially Inflated Traffic (AIT), Artificially Generated Traffic (AGT), and Trashing, they will also lead to an increase in grey routes resulting in more orange and red traffic.

Medium Risk

A market (or mobile operator) that receives a score of 20%-29% in the A.S.P.I.R. model is considered Medium Risk by Mobilesquared, with a greater-than-average propensity for consumers to experience a negative interaction with the brand, and therefore placing the brand's reputation at risk.

Medium Risk can primarily be attributed to the market's average international termination rate being 25%-99% above the average market rate (at that point in time), exclusive deals, and underperforming SMS firewalls, resulting in significant increases of fraudulent traffic.

To meet brand commitment based on allocated or campaign budget, between 25%-60% of traffic sent is likely to be via a grey route, and resulting in an increased threat from fraudulent traffic. This then places brand reputation at risk, and potential harm to consumers.

Low Risk

A market (or mobile operator) that receives a score of between 5%-19% in the A.S.P.I.R. model is considered Low Risk by Mobilesquared, with a slightly elevated propensity for consumers to experience a negative interaction with the brand, and the same in terms of placing the brand's reputation at risk.

Low Risk can be attributed to the market's average international termination rate being less than 24% above the average market rate (at that point in time), a low number of exclusive deals, and SMS firewalls operating above market average performance levels. Brand commitment will primarily be based on white routes, and the likelihood of an increased threat from fraudulent traffic is reduced.

No Risk

A market (or mobile operator) that receives a score of less than 4.99% in the A.S.P.I.R. model is considered No Risk by Mobilesquared, meaning there is no elevated propensity for consumers to experience a negative interaction with the brand based on normal traffic conditions; and the same in terms of placing the brand's reputation at risk.

Average international termination rate for the market between 0-24% above the average market rate or below average, low presence of exclusive deals, and highly-tuned SMS firewalls. To meet brand commitment, 75%-100% of traffic will be sent via white route traffic, ensuring a minimal threat from fraudulent traffic. Brand and consumers not at risk.

Methodology

The creation of the A2P SMS market data and forecasts that form the basis for the A.S.P.I.R. analysis can be found on the Mobilesquared website. The purpose of the A.S.P.I.R. model is to generate a low (including negative) number. The lower the number, the less likely incremental fraud will traverse a mobile operator's network, and therefore minimal risk to the consumer.

The calculation behind the A.S.P.I.R. analysis is:

(Above average fraudulent traffic by mobile operator PLUS the % difference of the mobile operator's international termination rate against the global average international termination rate PLUS the existence (or not) of an exclusive gateway deal per mobile operator PLUS the deployment (or not) of an SMS firewall per mobile operator) MULTIPLIED by the average traffic per mobile operator total minus fraud traffic.

To generate the market totals we have calculated the average score per market.

The Methodology behind the calculation is:

The fraud traffic component of the calculation is created by:

(Fraud traffic by type per mobile operator dividedby total traffic per mobile operator) MINUS (Fraud traffic by type per mobile operator minus average fraud traffic by type).

The international termination rate per mobile operator is based on actual pricing data shared by industry with Mobilesquared. We then apply the average rate based on all the pricing data shared. We then calculate the average international termination rate at that given moment in time, and from here we can calculate what percentage above or below each mobile operator's rate is against the average. It is this percentage figure that is used in the calculation.

Mobilesquared has given each mobile operator minus 10% (-10%) if they have deployed an SMS firewall, and plus 10% (+10%) if Mobilesquared believes an SMS firewall has not been deployed. The percentage is then applied to the three other components within the model.

Mobilesquared has given each mobile operator minus 10% (-10%) if they do not have an exclusivity agreement in place with an aggregator, and plus 10% (+10%) if such an agreement is in place. The percentage is then applied to the three other components within the model.

To create the market totals, we have taken the average figure based on the mobile operator data per market.