



HOUSTONKEMP
Economists

Declaration of SMS termination services and SMS spam

A report for Pivotel

9 November 2023

Report authors

Luke Wainscoat

Ashmit Vyas

Contact Us

Sydney

Level 40

161 Castlereagh Street

Sydney NSW 2000

Phone: +61 2 8880 4800

Disclaimer

This report is for the exclusive use of the HoustonKemp client named herein. There are no third party beneficiaries with respect to this report, and HoustonKemp does not accept any liability to any third party. Information furnished by others, upon which all or portions of this report are based, is believed to be reliable but has not been independently verified, unless otherwise expressly indicated. Public information and industry and statistical data are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information. The opinions expressed in this report are valid only for the purpose stated herein and as of the date of this report. No obligation is assumed to revise this report to reflect changes, events or conditions, which occur subsequent to the date hereof. All decisions in connection with the implementation or use of advice or recommendations contained in this report are the sole responsibility of the client.

Contents

1. Introduction	1
1.1 Instructions	1
1.2 Report structure	2
2. Relevant concepts	3
2.1 Causal inference compares observed outcomes with potential outcomes	3
2.2 Correlation does not imply causation	3
3. Assessment of Frontier Economics' analysis	5
3.1 Claims made by Frontier Economics	5
3.2 Frontier Economics' methodology does not stand up to scrutiny	6

Figures

Figure 3.1: SMS scam volumes and year-on-year growth rates 2014-2022



1. Introduction

1. We have been engaged by external counsel to Pivotal Group Pty Ltd (Pivotal) to prepare this report on the effect of the declaration of short message services (SMS) termination on SMS spam and scams.
2. We have previously prepared a report on the likely competitive effects of the declaration of a mobile terminating access service (MTAS) for SMS under Part XIC of the *Competition and Consumer Act 2010* (CCA) (first HoustonKemp report).¹ Please see that previous report for our description of the background and context to this matter.

1.1 Instructions

3. TPG said in a recent submission to the Australian Competition and Consumer Commission (ACCC) that:²

Declaration of SMS termination coincided with a significant increase in complaints and report to the ACMA [Australian Communications and Media Authority] about SMS spam. Frontier Economics provided analysis during the previous declaration inquiry.

4. The analysis undertaken by Frontier Economics referred to in the quote above is contained within a report dated 21 September 2018 (the Frontier Economics report).³ In short, that report concluded:⁴

...the ACCC's declaration of SMS termination and associated reduction in price has very likely had the effect of increasing the amount of SMS spam, and thereby imposing a range of external costs on end users and industry.

5. We have been asked to provide our opinion on whether:
 - a. the Frontier Economics report provides evidence to support the claim made by TPG set out in paragraph 3 above; and
 - b. the Frontier Economics report identifies a connection between spam/scam SMS and the declaration of SMS termination, including whether the methodology employed by Frontier Economics withstands scrutiny.
6. We agree with Frontier Economics that the declaration of SMS termination will be associated with a reduction in the price for that service,⁵ and vice versa. Our assessment of the effect of declaration of SMS termination includes the effect of the associated reduction in prices for that service.

¹ HoustonKemp, *Effect of declaration on competition in A2P SMS markets*, 27 July 2023.

² TPG Telecom, *ACCC declaration inquiry*, 19 October 2023, slide 5.

³ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018.

⁴ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 17.

⁵ See paragraph 4 above.

1.3 Report structure

7. The remainder of our report is set out as follows:
 - a. in section two, we introduce the concept of causal inference, ie, the process of identifying cause-and-effect relationships; and
 - b. in section three, we explain why, in our opinion, the analysis of Frontier Economics does not demonstrate that declaration of SMS termination services and the associated reduction in price for those services caused an increase in the volume of SMS spam or scams.

2. Relevant concepts

8. Before evaluating Frontier Economics' claims and methodology, we set out the economic and statistical concepts on which our analysis relies, which are:
- a. the principle of causal inference; and
 - b. the distinction between correlation and causation.

2.1 Causal inference compares observed outcomes with potential outcomes

9. Causal inference is defined as:⁶

The leveraging of theory and deep knowledge of institutional details to estimate the impact of events and choices on a given outcome of interest.

10. When estimating the causal effect of a particular intervention, economists typically compare:⁷
- a. observed outcomes in the real world when the intervention takes place; to
 - b. potential outcomes under a counterfactual world without the intervention.

11. The challenge is to develop a reasonable understanding of how the data *would* look in the counterfactual world in which the intervention does not take place, but everything else is held equal. This requires the effects of confounding variables on the variable of interest in both the real and counterfactual world to be taken into account.

12. Claims of causation must be justified by or inferred from economic theory.⁸ Kendall and Stuart write:⁹

A statistical relationship, however strong and however suggestive, can never establish causal connection: our ideas of causation must come from outside statistics, ultimately from some theory or other.

13. It follows that causation requires a good understanding of how the intervention being examined should, in principle, effect the variables of interest.

2.2 Correlation does not imply causation

14. Correlation is a statistical measure of the relationship between variables. Two variables are positively correlated if they move in the same direction, eg, as one variable increases, so does the other. Conversely, two variables are negatively correlated if they move in opposite directions.¹⁰
15. It is well known amongst economists that correlation does not imply causation.¹¹ If event A coincides with event B, this does not imply that event A *caused* event B. In other words, observed associations between variables do not always indicate a cause-and-effect relationship.

⁶ Cunningham, S, *Causal inference: The mixtape*, Yale University Press, 2021, p 4.

⁷ Varian, H, *Causal inference in economics and marketing*, Proceedings of the National Academy of Sciences, 113, 2016, p 7,310.

⁸ Gujarati, D and Porter C, *Essentials of econometrics*, Fourth edition, McGraw-Hill Irwin, 2010, p 22.

⁹ Kendall, M and Stuart A, *The advanced theory of statistics*, Charles Griffin Publishers, 1961, p 279.

¹⁰ Australian Bureau of Statistics, <https://www.abs.gov.au/statistics/understanding-statistics/statistical-terms-and-concepts/correlation-and-causation>, accessed 2 November 2023.

¹¹ Hubbard, D W, *How to measure anything*, Third edition, Wiley, 2014, p 241.

16. Two possible reasons for there being correlation without causation are that:
- a. there is a confounding factor that is causing both events A and B to occur.¹² For example, there is a documented relationship between ice cream consumption and sunburn. This is caused by a confounding factor, being that both ice cream sales and sunburn rates are likely to increase in the summer when it is sunny and warm;¹³ and
 - b. an association between two variables may be purely coincidental. A well-known example is that divorce rates in the state of Maine in the United States are highly correlated with margarine consumption, even though it is implausible that there is a cause-and-effect relationship at play.¹⁴

¹² A confounding factor is a variable that is jointly associated with both the predictor of interest and the outcome. See Cunningham, S, *Causal inference: The mixtape*, Yale University Press, 2021, p 99.

¹³ The European Food Information Council, https://www.eufic.org/images/uploads/understanding-science/Correlation_Vs_Causation_-_Print_en.pdf, accessed 30 October 2023. This is an example of omitted variable bias (OVB), which occurs when an apparent cause-and-effect relationship between two variables is actually attributable to some third variable that has been excluded from the analysis.

¹⁴ Spurious Correlations, https://www.tylervigen.com/view_correlation?id=1703, accessed 30 October 2023.

3. Assessment of Frontier Economics' analysis

17. The volume of complaints and reports of SMS spam increased from 2014/15 to 2016/17. To the extent to which it can be said that two events coincide if they occur in the same two-year period, it is accurate for TPG to say that '[d]eclaration of SMS termination coincided with a significant increase in complaints and report to the ACMA about SMS spam.'¹⁵
18. Frontier Economics says that these events are not only correlated, but there is a causal relationship between the two, ie, '...the ACCC's declaration of SMS termination and associated reduction in price has very likely had the effect of increasing the amount of SMS spam...'.¹⁶
19. In our opinion, the analysis of Frontier Economics does not demonstrate that declaration of SMS termination services and the associated reduction in price for those services caused an increase in the volume of SMS spam or scams because:
 - a. the Frontier Economics report uses unreasonable counterfactuals to estimate the effects of declaration on SMS spam and scams; and
 - b. extending Frontier Economics' analysis by a few years demonstrates that there is no correlation (let alone causation) between the declaration of SMS termination services and the volume of SMS scams.
20. In summary, SMS scam volumes have continued to increase substantially from 2015 to 2022 no matter what happens to the declaration of SMS MTAS.

3.1 Claims made by Frontier Economics

21. Frontier Economics says that complaints and reports of spam increased dramatically.¹⁷ Based on the figures presented by Frontier Economics, it is true that complaints and reports relating to SMS spam were substantially higher in 2016/17 than in 2014/15.¹⁸
22. It follows that, to the extent to which it can be said that two events coincide if they occur in the same two-year period, it is accurate for TPG to say that '[d]eclaration of SMS termination coincided with a significant increase in complaints and report to the ACMA about SMS spam.'¹⁹
23. Frontier Economics says that these events are not only correlated, but there is a causal relationship between the two. Frontier Economics says both directly and indirectly that the inclusion of SMS termination services in the MTAS declaration caused an increase in SMS spam and scams after the regulation came into effect on 1 January 2016. This claim is made in:
 - a. section 1.3, which refers to:²⁰
 - ...the costs that declaration have imposed on end users with respect to:
 - spam SMS

¹⁵ TPG Telecom, *ACCC declaration inquiry*, 19 October 2023, slide 5.

¹⁶ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 17.

¹⁷ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 7.

¹⁸ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, pp 8-9.

¹⁹ TPG Telecom, *ACCC declaration inquiry*, 19 October 2023, slide 5.

²⁰ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, pp 1-2.

- scams perpetuated using SMS messaging;

b. section 1.4, which states that:²¹

...the declaration of SMS termination has led to unintended consequences that reduce economic efficiency. These consequences are the increase in SMS spam and SMS scams;

- c. section 3.2, which provides a counterfactual analysis to estimate the cost of SMS spam associated with the declaration; and
- d. section 4.3, which provides a counterfactual analysis to estimate the cost of SMS scams associated with the declaration.

24. Frontier Economics attributes increased spam and scam volumes to the reduction in prices caused by MTAS SMS declaration, eg:²²

At the time of the inclusion of SMS in the MTAS declaration, the ACCC received a number of submissions that declaring A2P SMS services, **when coupled with regulated prices**, would lead to an increase in spam SMS. [emphasis added]

...

... there has been a material increase in SMS scams reported **since the time of the price reductions for SMS termination** at the start of 2016. [emphasis added]

25. We agree with Frontier Economics that declaration of SMS termination likely coincides with lower prices for those services. Our assessment of the effect of declaration of SMS termination includes the effect of the associated reduction in prices.

3.2 Frontier Economics' methodology does not stand up to scrutiny

3.2.1 Frontier Economics uses unreasonable counterfactuals

26. With regard to SMS spam, the Frontier Economics report assumes that without declaration:²³

- SMS spam complaints would have increased at the same rate as a linear extrapolation from 2012/13 to 2014/15;
- SMS spam reports would have decreased at a logarithmic rate from 2012/13 to 2016/17; and
- the SMS spam rate, ie, SMS spam volume as a percentage of total SMS volume,²⁴ would have remained constant at one per cent.

27. The Frontier Economics report assumes that without declaration, SMS scam volume over 2015 to 2017 would have:²⁵

- increased at the same yearly rate as the growth rate from 2014 to 2015 (two per cent); or
- increased at the same yearly rate as the growth rate for total SMS volume from 2014 to 2015 (16 per cent).

28. In our opinion, these counterfactuals are unreasonable because:

²¹ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 2.

²² Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, pp 3 and 13.

²³ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, pp 7-9.

²⁴ It is our understanding that figure 2 in the Frontier Economics report understates SMS volumes by a factor of 1,000.

²⁵ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 14.

- a. Frontier Economics does not take into account other factors affecting the incidence of spam and scams – it is simply assuming that short-term growth patterns will remain the same when there is no basis for this assumption;
- b. it is not reasonable to draw a trend over such a short period of time and expect it to continue; and
- c. Frontier Economics uses different assumptions for spam and scams – the use of a consistent method would find that SMS spam complaints actually fell due to SMS MTAS declaration.

Other factors affect the incidence of spam and scams

29. Reports and complaints regarding SMS spam and scams are affected by a number of factors, including:
 - a. the emergence of sophisticated technology that makes spam and scam messages more difficult to identify, eg, by allowing scammers to impersonate phone numbers and websites of legitimate organisations;²⁶
 - b. advances in email spam filters that cause scammers to increasingly target SMS;²⁷ and
 - c. how easy it is for consumers to make a report or complaint about spam, and how much media attention is given to the issue.
30. Frontier Economics does not take account of these (or any other) factors. Analysis that does not consider these confounding variables will not yield a reliable estimate for the effect of declaration of SMS termination services and the associated reduction in prices for those services.
31. The effect of all other factors is included in Frontier Economics' assumption regarding the counterfactual. For example, Frontier Economics assumes that the SMS scam volume will increase by two per cent or 16 per cent per year.²⁸ In doing so, it is implicitly assuming that all factors other than declaration lead to a two per cent or 16 per cent increase in scam volume in every year. There is no basis for this, and no reason to believe that yearly percentage increases in scam incidence will be constant with technology changing quickly.
32. Therefore, it is our opinion that the counterfactuals used by Frontier Economics are not reasonable or robust.

Counterfactual estimates are based on data over a short timeframe

33. Frontier Economics takes the growth rate of spam and scam incidence in the two to three years immediately preceding declaration and assumes that the same pattern will continue into the future.
34. In our opinion, counterfactual estimates based on data collected over such a short period of time are not credible. To the extent that past patterns can reliably predict future events, data should be collected over longer timeframes.
35. As discussed in section 2.2, constructing a credible counterfactual requires thoughtful consideration of what the world would look like in the absence of intervention. It is not sufficient to assume the continuation of existing patterns without any justification because trends evolve with time.

²⁶ ACCC, *Targeting scams 2022*, p iii.

²⁷ Vasileiou, I, & Haskell-Dowland, P, *Being bombarded with delivery and post office text scams? Here's why — and what can be done*, The Conversation. <https://theconversation.com/being-bombarded-with-delivery-and-post-office-text-scams-heres-why-and-what-can-be-done-167975>, 2022, accessed 8 November 2023.

²⁸ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 14.

Counterfactual estimates are based on inconsistent timeframes and growth patterns

36. Frontier Economics assumes that without declaration:
- a. SMS scams would have increased at the rate of growth from 2014 to 2015, ie, the growth rate over *one year*;²⁹ and
 - b. SMS spam complaints would have increased at the linear rate extrapolated over 2012/13 to 2014/15, ie, the growth rate over *two years*.³⁰
37. The effect of SMS MTAS declaration and the associated price changes would be to *lower* SMS spam complaints if the Frontier Economics analysis was performed in the same manner as SMS scams, ie, using a one-year growth rate. The growth rate in SMS complaints from 2013/14 to 2014/15 was just under 30 per cent.³¹ Extrapolating that forward to 2016/17 would give approximately 640 complaints under the counterfactual, when there were less than 600 in the factual.³²

3.2.2 No correlation (let alone causation) between declaration and scam volumes

38. MTAS for SMS services was declared from 1 January 2016 to 1 January 2020.³³ The analysis of Frontier Economics implies that:
- a. scam incidence should have increase at Frontier's assumed counterfactual rates from 9,537 in 2016 to 10,120 (two per cent yearly growth) or 14,886 (16 per cent yearly growth) in 2019 as declaration status did not change over this period; and
 - b. growth in scam volumes should have slowed down from 2020.
39. In fact, scam volumes kept increasing rapidly no matter what happened to the declaration of SMS MTAS, ie, there is no correlation between declaration, including the associated price changes, and the volume of SMS scams or spam.

SMS scam volumes during the declaration period contravene Frontier Economics' assumptions

40. The declaration *status* of SMS MTAS did not change from 2016 to 2019. According to Frontier Economics' assumptions, the volume of SMS scam should therefore have increased by either two per cent or 16 per cent per year during this period.
41. Figure 3.1 shows that the volume of scams kept increasing by much more than 16 per cent in 2017 and 2018, even though there were no changes to the declaration status of SMS termination charges.³⁴ This implies that some other confounding factor was causing this increase, and so was also likely to be causing the increase in 2016, which Frontier Economics associated with the change in declaration status.

²⁹ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 14.

³⁰ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 8.

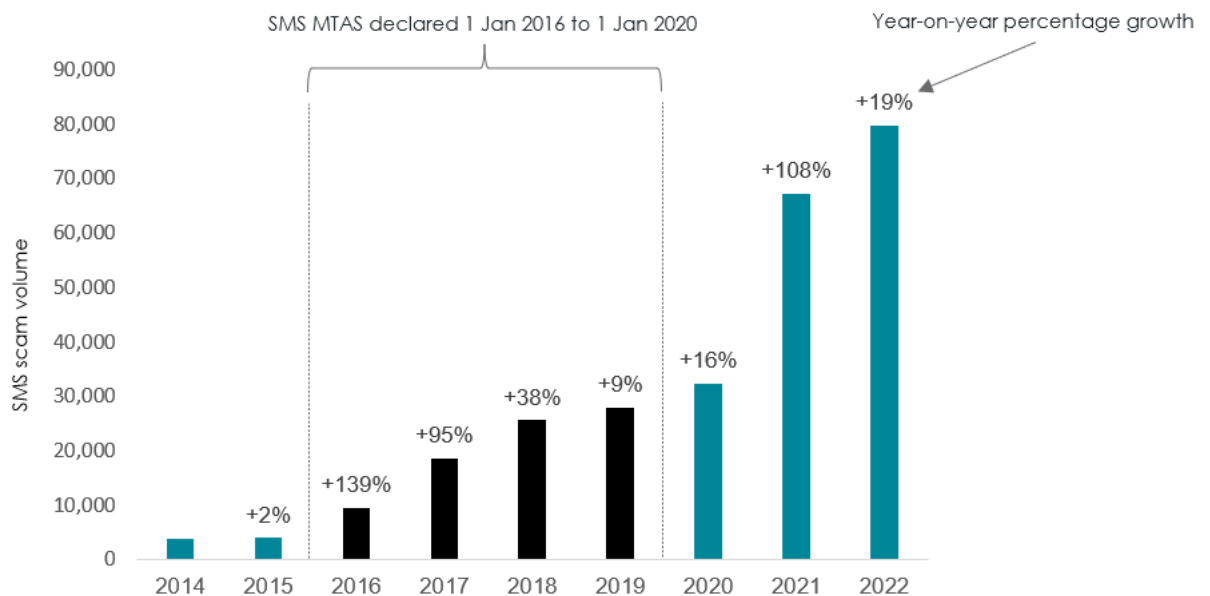
³¹ Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 8, figure 3.

³² Frontier Economics, *The costs of including SMS termination in the MTAS declaration*, 21 September 2018, p 8, figure 3.

³³ ACCC, <https://www.accc.gov.au/media-release/regulation-of-wholesale-mobile-voice-terminating-services-to-continue>, accessed 1 November 2023.

³⁴ The Frontier Economics report relies on ACMA estimates for spam volume prior to 2017. We were unable to locate this data as the internet source provided by Frontier Economics is no longer accessible. Moreover, it appears that ACMA did not publish spam estimates for subsequent years. We consequently limit our focus to scam volumes in this section.

Figure 3.1: SMS scam volumes and year-on-year growth rates 2014-2022



Source: ACCC, *Targeting scams*, various years

Note: Growth rates expressed as percentage increase in SMS scam volume relative to preceding year.

Growth in SMS scams did not decelerate when the declaration period ended

42. The analysis and conclusions of Frontier Economics would imply that the volume of SMS scams should decelerate or fall when the period of declaration ended, and the associated SMS termination prices presumably increased. As shown in figure 3.1, the volume of SMS scams actually increased substantially after the declaration period of SMS ended.³⁵ The volume of SMS scams grew at a faster rate in each of the three years since declaration expired than they did in the final year of the declaration period.
43. The volume of SMS scams post-declaration also increased at a substantially faster rate than pre-declaration, again demonstrating that Frontier's assumption of a constant yearly growth rate in the absence of declaration is unrealistic.
44. SMS scams continued to grow in prevalence even after the SMS MTAS declaration expired. Therefore, it is highly likely that scams are driven by causes other than declaration and its associated effects on prices. This implies that Frontier Economics:
 - a. underestimated the effect of confounding factors on the volume of SMS scams; and
 - b. overestimated the effect of declaration and its associated effects on prices on the volume of SMS scams.

³⁵ Frontier Economics' figures on SMS scams between 2014 and 2017 are based on reports made to Scamwatch, as reported in the ACCC's annual *Targeting scams* reports. For consistency, we use the same data.

46. Finally, voice MTAS was declared in 1997 and remains declared to this day.³⁶ Despite no changes to the declaration status of voice MTAS, phone scams increased from 44,411 in 2014 to 144,603 in 2021.³⁷ This points to the existence of factors that – independently of declaration status and the prices for termination services – placed an upward pressure on phone scams. It is likely that some of these factors also contributed to the rise in SMS scams.

³⁶ ACCC, <https://www.accc.gov.au/media-release/regulation-of-wholesale-mobile-voice-terminating-services-to-continue>, accessed 1 November 2023.

³⁷ ACCC, *Targeting scams 2014*, p 8 and *Targeting scams 2022*, p 7.



HOUSTONKEMP

Economists

Sydney

Level 40
161 Castlereagh Street
Sydney NSW 2000

Phone: +61 2 8880 4800