

April 12, 2019

BY ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

REDACTED – FOR PUBLIC INSPECTION

Re: Applications of T-Mobile US, Inc. and Sprint Corporation for Consent to Transfer
Control of Licenses and Authorizations, WT Docket No. 18-197

Dear Ms. Dortch:

Pursuant to Section 1.1206(b) of the Commission's Rules, 47 C.F.R. § 1.1206(b), notice is hereby provided of a written *ex parte* presentation in the above-referenced docket. By this filing, T-Mobile US, Inc. ("T-Mobile") and Sprint Corporation ("Sprint," and collectively with T-Mobile, "Applicants") provide additional information pertaining to diversion ratios and data sources for calculating such ratios to respond to questions from the Transaction Team and recent filings by merger opponents.

In particular, Applicants attach a White Paper by T-Mobile counsel that examines various industry data sources that can be used to analyze subscriber switching as a proxy for diversion. *The White Paper demonstrates that utilizing any data that reflects a reasonably representative sample of customers leads to the conclusion that the merger is pro-competitive each and every year from approval through 2024.* Porting data – which Applicants have demonstrated to be not representative – are the only one of the many sources that leads to a contrary result. The White Paper additionally demonstrates that the Applicants do not rely on porting data to estimate diversion ratios. In support, the Applicants submit herewith a chart correcting DISH's mischaracterization of documents in the record pertaining to the Applicants' use of porting data.¹ Also attached is a declaration from Mark Israel, Michael Katz and Bryan Keating ("IKK") that supplements their prior analysis of the effects of the merger on consumer welfare by considering

¹ See generally Letter from DISH Network Corporation, WT Docket. 18-197 (filed January 28, 2019) ("DISH Letter") and Coleman Bazelon, Jeremy Verlinda, and William Zarakas, *Response to Applicant Filings on Diversion Ratios*, WT Docket No. 18-197 (filed January 28, 2019).

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two additional sources of estimated diversion ratios. Finally, the Applicants have included a USB drive containing back-up materials for the IKK analysis.

This filing contains information that is “Highly Confidential” pursuant to the Protective Order filed in WT Docket No. 18-197.² Accordingly, pursuant to the procedures set forth in the Protective Order, a copy of the filing is being provided to the Secretary’s Office, including the USB drive. In addition, two copies of the Highly Confidential Filing are being delivered to Kathy Harris, Wireless Telecommunications Bureau, with a copy of the USB drive. A copy of the Redacted Highly Confidential Filing is being filed electronically through the Commission’s Electronic Comment Filing System.

Please direct any questions regarding the foregoing to the undersigned.

Respectfully submitted,

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² *Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Assign Licenses*, Protective Order, WT Docket No. 18-197 (June 15, 2018).

All Reasonable Sources for Diversion Show the Transaction Is Procompetitive

Diversion ratios are used as one input to project the effect of eliminating a competitor on pricing incentives. All economists agree that ideal diversion ratios should (1) reflect a representative sample of customers; and (2) identify only switching by consumers that would occur in response to a price or quality change by the firm being studied. The Applicants have put forward the only record evidence that meets both of these criteria, the Asker, Bresnahan, Hatzitaskos (“ABH”) econometric study, the best available measure of diversion.

Nonetheless, there are a wide range of industry data sources that, while not as good as an econometric study, can be used to analyze subscriber switching as a proxy for diversion. These include T-Mobile’s HarrisX survey, Sprint’s Research Now SprintIQ survey, Facebook data, reported metrics such as share of gross adds (SoGA) or share of deactivations (SoDA). The Applicants’ documents show that these sources each have strengths and weaknesses, and that the Applicants use them together to mitigate the deficiencies of each individual source. **Critically, every approach to estimating diversions that reflects a representative sample of customers (and even one that does not, Facebook) leads to the conclusion that the merger is procompetitive.** Moreover, the closer each approach is to the economists’ ideal measure, the more procompetitive that source generally shows the merger to be.

Table 1: Consumer Welfare Improvement Per Sub Per Month (’19-’24) and Total Discounted Welfare Gain¹

Data Source	2019	2020	2021	2022	2023	2024	Total Welfare Gain per Subscriber	Merger Good?
Baseline Case (ABH) ²								✓
ABH-Nested Logit ³								✓
HarrisX Mobile Insights								✓
Sprint Brand IQ Survey								✓
SoGA/SoDA Estimates								✓
Subscriber Shares								✓
Facebook Data ⁴								✓

Porting data are the only one of these many sources that lead to a contrary result, but they are not a reasonable source of diversion ratios because they are biased from excluding a group of customers with very different switching behavior. Number portability (porting)

¹ Mark Israel, Michael Katz, and Bryan Keating (“IKK”), *Extension of the Israel, Katz, and Keating Analysis to 2019-2020* (Attachment A to letter from Nancy Victory, Counsel for T-Mobile, to Marlene Dortch, FCC, WT Docket No. 18-197 (February 21, 2019)), Table 3 (“IKK Extension”). This is the source for rows 1, 3-6 of Table 1.

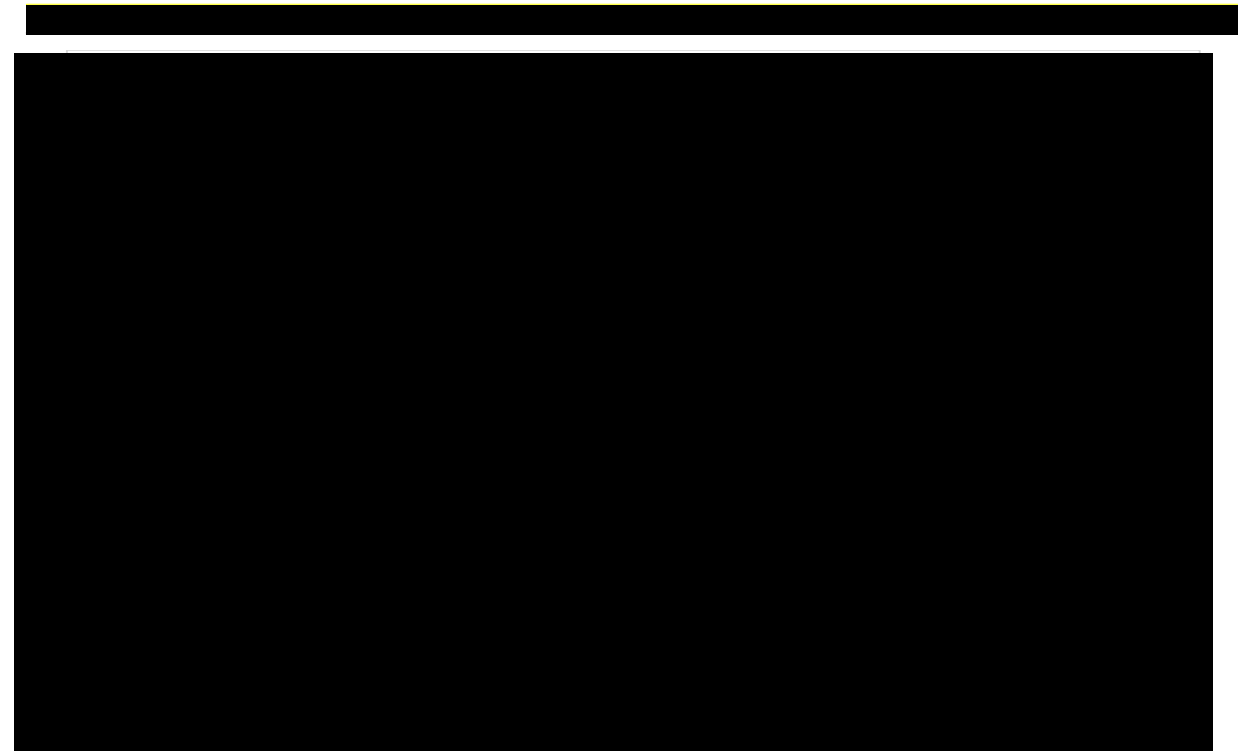
² Assumes [REDACTED]

³ Assumes [REDACTED]

⁴ The reported figures adjust Facebook data using the method that T-Mobile applies in the ordinary course of business, *see, e.g.*, TMUS-FCC-01921550 at 55, to partially account for the fact that Facebook oversamples Sprint and T-Mobile and undersamples AT&T and Verizon. But, even merger simulations based on the raw, more biased data, produce positive results in each year and [REDACTED] of welfare gain per subscriber. *See* backup materials and accompanying IKK declaration for calculation details.

data track when customers transfer (port) their phone number to a new carrier. But porting data exclude the [REDACTED] of customers who switch and do not port their phone numbers.⁵ Although the Commission has used porting data in the past, notwithstanding their limitations, past Applicants have not submitted record evidence that those limitations lead to significant bias that could impact the outcome of the Commission’s review.⁶ But, unlike past proceedings, *here the Applicants have submitted extensive record evidence that demonstrates that porting and non-porting customers behave very differently from one another, and thus the bias in porting data is very large.*

For example, Sprint surveys Boost and Virgin users who deactivate in the ordinary course, and that survey separates porters from non-porters. Figure 1 shows the survey results for switching between Sprint’s prepaid brands and all of T-Mobile brands. The survey data for those porting away from Sprint’s prepaid brands is a close match to porting data, showing that the Sprint deactivation survey is reliable. But the survey data for those switching away from Sprint’s prepaid brands and not porting indicate that these customers are much less likely than are porters [REDACTED], showing that the porting data far overstate [REDACTED]. Thus, applying the characteristics of porters, a non-representative sub-set, to all switchers, violates the representativeness necessary for diversion ratios, yet this is what DISH proposes the Commission do.⁷



⁵ IKK, *Reply Declaration of Mark Israel, Michael Katz, and Bryan Keating*, WT Docket No. 18-197 (filed Sep. 17, 2018), ¶ 176 (“IKK Declaration”).

⁶ Staff Analysis and Findings, *In the Matter of Applications of AT&T Inc. and Deutsche Telekom AG for Consent to Assign or Transfer Control of Licenses and Authorizations*, WT Docket 11-65, rel. November 29, 2011 (“AT&T/T-Mobile Commission Staff Report”), Appendix C, ¶ 10.

⁷ Letter from DISH Network Corporation, WT Docket. 18-197 (filed Jan. 28, 2019) (“DISH Letter”) and Coleman Bazelon, Jeremy Verlinda, and William Zarakas, *Response to Applicant Filings on Diversion Ratios*, WT Docket No. 18-197 (filed Jan. 28, 2019) (“BVZ Response”).

Ordinary course documents show that the Applicants recognize the bias in porting data, use it in ways that are not similar to a diversion analysis, and use it because it is available immediately while more representative sources are significantly delayed. The Applicants’ documents are filled with statements such as “[REDACTED]

[REDACTED]”⁹ Internal documents particularly highlight that this bias is greater for prepaid and MVNO customers—an overwhelming majority of whom do not port their number when switching: e.g., “[REDACTED]

[REDACTED]”¹⁰ and “[REDACTED]”¹¹

Despite these deficiencies, T-Mobile and Sprint do look at porting data in running their businesses, just as firms in all industries look at a variety of readily available competitive intelligence. But the way they use the porting data does not suggest that the data would be an accurate source for calculating diversion ratios. The Applicants typically use net ports, porting ratios, and porting shares as short-term, directional gauges of how all existing promotional activity from all firms is affecting switching, rather than isolating the change in porting rates from a single promotional event and calculating a precise switching rate. In its filing with the Commission, DISH supports its proposal that the Commission employ biased porting data to estimate diversion by pointing to the Applicants’ use of porting data.¹² DISH repeatedly misrepresents ordinary course documents, ignoring caveats about porting data’s biases, disregarding clear efforts to correct for porting data’s flaws, and conflating assessments of outside porting data to internal porting data with judgments on porting data’s representativeness.¹³

Moreover, DISH also ignores that the documents that look at porting data do so because they are often the only data that are available in the time frame for which the company needs them. Porting data provide daily information in near real-time, while all of the other data sources above are released with a much greater lag and reflect switching over longer periods. In the ordinary course, the Applicants cannot wait for the month or quarter it takes to get survey data results to see if a promotion is having an impact on potential subscribers, and they cannot use data that aggregate a month-long period to analyze a three-day promotion.¹⁴ When the company does conduct analyses of all switching over longer time scales, it uses more reliable data sources.¹⁵ Thus, the Applicants prefer to use more representative switching data sources when analyzing all switching,

⁸ IKK, *Porting Data are Biased and Inferior to Both Survey Data and Structural Demand Estimation As a Means of Estimating Diversion Ratios* (Appendix B to letter from Nancy Victory, Counsel for T-Mobile, to Marlene Dortch, FCC, WT Docket No. 18-197 (Feb. 7, 2019)), Table 1.

⁹ TMUS-FCC-04247371 at TMUS-FCC-04247371.

¹⁰ TMUS-FCC-01914010 at TMUS-FCC-01914010.

¹¹ SPR-FCC-06676630 at SPR-FCC-06676630. *See also* SPR-FCC-05930527 at SPR-FCC-05930527 (“[REDACTED]”).

¹² DISH Letter.

¹³ *See* Appendix A for a chart showing some of the ways DISH has mischaracterized the Applicants’ ordinary course documents.

¹⁴ *See, e.g.*, TMUS-FCC-04247371 (“[REDACTED]”); SPR-FCC-05114480 (“[REDACTED]”).

¹⁵ TMUS-FCC-04252052 (“[REDACTED]”).

but they are not always available in the time frame needed. Showing that the Applicants use a data source out of necessity does not prove its reliability, but instead only reinforces that it is the only source available at the time. In conducting the merger analysis, we have the benefit of more accurate data than is available instantaneously in the ordinary course, and we should use it.

The ABH demand model is the best method for calculating diversion ratios, because it is the only record evidence that answers the relevant question for merger analysis: where would a firm’s customers go in response to the firm raising price or lowering quality?¹⁶ The ABH econometric demand model is based on an enormous set of panel data—over 300 million observations from a nationally representative set of consumers—and reveals the carrier that each panel member chooses and the quality that the consumer experiences.¹⁷ Because of the richness of the data, ABH are also able to calculate the quality that each panel member would have experienced had that person used a different carrier—and thus exactly how much quality that person would gain or give up by switching to the other carrier and how much that person values quality. This information, in turn, allows ABH to ask the question, if one brand raised prices but everything else were held constant, who would switch and where would they go?¹⁸ That is the question of diversion that ABH can answer using the hundreds of millions of observations in their data set, in light of each panel member’s choice of carrier based on the price and quality options available to that panel member.¹⁹ By contrast, switching data capture all switching and cannot similarly isolate changes in price or quality by the firm in question, even if they reflect a representative sample. And even looking at switching rates during promotional periods is insufficient, as other carriers typically make price or quality changes at the same time. As a result, the ABH econometric demand model is the best source of diversion available.

* * *

In sum, the Applicants have submitted the only record evidence that properly measures diversion ratios, the ABH econometric model, and the Commission should use that measure. **But all other reasonable sources of data also confirm the merger is procompetitive**, so the Commission can also base its conclusion on the effects of the merger on this wide range of sources. The Commission should not, however, give undue weight to porting data as the sole source of diversion ratio estimates. In the past, Commission staff have acknowledged that porting data may be a biased subset.²⁰ The Applicants have demonstrated porting data to be biased in ways that makes it unrepresentative for analyzing the effect of the merger.

I. The Applicants use a wide spectrum of data sources to analyze subscriber switching.

As noted above, multiple data sources analyze subscriber switching between mobile wireless carriers, each with its own strengths and weaknesses. In the ordinary course, the

¹⁶ While diversion analysis includes both in- and out-bound switches, we have simplified the description above for clarity.

¹⁷ ABH, *Economic Analysis Of The Proposed T-Mobile/Sprint Merger*, WT Docket No. 18-197 (filed Nov. 6, 2019), ¶ 161.

¹⁸ Although the main variation in the ABH model arises due to rich data on network quality, diversion in response to quality changes are also informative about diversion in response to price changes.

¹⁹ ABH performed further econometric analysis by running a nested logit regression. See ABH, Response To Dish Comments Regarding Diversion Ratios, WT Docket No. 18-197 (filed Feb. 7, 2019) (“ABH Diversion Response”), Exhibit 8. This nested logit regression allowed for the possibility that individual consumers may have stronger or weaker preferences for all brands within a group (or “nest”). Testing a variety of different potential nests only resulted in marginal differences from ABH’s originally calculated baseline diversion ratio results. The results of the nested logit continue to show the merger is procompetitive when IKK use them in its model. See Table 1.

²⁰ AT&T/T-Mobile Commission Staff Report”), Appendix C, ¶ 10.

Applicants use a variety of these sources in parallel, in part to take advantage of their strengths and to mitigate their weaknesses.

As detailed in Table 2, the data sources used to analyze subscriber switching vary across multiple dimensions. Importantly, they track switching over different periods and become available with varying degrees of lag from the period they cover.

Table 2: Representative Data Sources Are Available Less Often and Cover Longer Periods of Time Than Unrepresentative Data Sources

Data Source	Data Receipt Lag	Time Period Covered	Representative of all Switching?
Porting Data	1-2 Days	Daily	No: Only subscribers that port their number when switching. Also does not include customers who port to and from most MVNO brands.
Facebook Actionable Insights	10 Days	Trailing 30 days	No: Only subscribers that use Facebook Mobile, but more representative than porting data.
Sprint Research Now/BrandIQ	Weekly to Monthly ²¹	Trailing week or month	Yes.
HarrisX Mobile Insights	1-3 Months	Past year	Yes.
SoGA and SoDA	1-3 Months	Quarterly	Yes.

The representative data sources are available far less frequently and with more of a lag than unrepresentative data sources. This lower frequency is why, despite their biases, the Applicants regularly use porting data and sometimes Facebook data. For instance, if T-Mobile ran a three-day promotion, it could use porting data to analyze the effect of the promotion within days and on a daily basis. By contrast, HarrisX data would only provide data for a twelve-month moving average including the month in which the promotion took place, and T-Mobile would not receive the initial data for at as long as six weeks after the promotion. Thus, T-Mobile would have to wait for several weeks for data that could hardly be used to analyze the effect of the promotion due to aggregation of the promotional days into months' worth of non-promotional data. While this lag poses challenges for the Applicants to use HarrisX in running their businesses in the short run, a longer lag time or period covered does not hinder calculating diversion by economists after the data have been received.

a. T-Mobile uses HarrisX Mobile Insights data to analyze switching.

T-Mobile uses HarrisX's Mobile Insights survey data to analyze switching.²² These data analyze switching on a monthly basis and thus are not as effective for analyzing short-term changes. But these data have the advantage of covering both porting switchers and non-porting switchers. Moreover, because HarrisX data provide additional information on switchers, such as

²¹ Although available daily, internal emails demonstrate that daily data do not drive business decisions because of the very small sample size (<200 wireless subscriber respondents per day), and that Sprint prefers to use it only on weekly or longer time frames. *See, e.g.*, SPR-FCC-04819162 at SPR-FCC-04819162 (“[REDACTED]”); SPR-FCC-01191471 at SPR-FCC-01191471 (“[REDACTED]”).

²² *See, e.g.*, TMUS-FCC-03054425, TMUS-FCC-05216865, TMUS-FCC-00799134, TMUS-FCC-01886612, TMUS-FCC-00215045, TMUS-FCC-07546656, and TMUS-FCC-07574678. Note that the Mobile Insights survey was previously owned by Nielsen and is sometimes referred to as “Nielsen Data” or similar terms in ordinary course documents.

their demographic information, T-Mobile uses them to analyze switching between providers in sub-segments such as [REDACTED].²³ Similarly, T-Mobile documents show that the company uses these data for other targeted switching analyses. For instance, because HarrisX Mobile Insights data [REDACTED]

[REDACTED]²⁴

More importantly, T-Mobile uses HarrisX data to perform thorough analyses of all switching behavior. For example, T-Mobile creates [REDACTED]. As opposed to porting data, which only reflect switching by customers that port their number, these reports also provide detail on subscribers that switch without porting their number. Other documents show that T-Mobile sometimes uses HarrisX for similar analyses on monthly and ad hoc bases.²⁵

[REDACTED]²⁶

Given the comprehensive picture of porting and non-porting switchers provided by HarrisX data, T-Mobile also uses these data to fill in gaps in other switching data sources.²⁷ For instance, T-Mobile recognized in an email that porting data are not a good “performance indicator” for the

²³ See, e.g., TMUS-FCC-01886612; TMUS-FCC-03777762 at TMUS-FCC-03777762 to 7763; and TMUS-FCC-00799134.

²⁴ See TMUS-FCC-08148324, TMUS-FCC-07546656, and TMUS-FCC-07652903.

²⁵ See, e.g., TMUS-FCC-03053822; TMUS-FCC-03905587; and TMUS-FCC-04051278 at TMUS-FCC-04051348 *et seq.*

²⁶ TMUS-FCC-01887976 at TMUS-FCC-01887981. Chart shows proportion of switches to each brand.

²⁷ See, e.g., TMUS-FCC-00796583 at TMUS-FCC-00796583 (“[REDACTED]”).

MVNO segment.²⁸ In response, T-Mobile used HarrisX data to get a more accurate read on MVNO switching.²⁹

b. Sprint uses its Daily IQ survey to analyze switching.

Sprint regularly uses a survey called “Daily IQ” to analyze customer switching behavior.³⁰ Enhancing understanding on switching behavior is a stated objective of the Daily IQ survey.³¹ The survey includes questions [REDACTED]. For instance, the Daily IQ survey provides data on customers who say they “ [REDACTED].³² The data are broken down by current carrier and then customers’ preferences are graphed for likely switchers (see Figure 3).³³ These useful switching preference data allow Sprint to see where marginal customers are likely to switch. Furthermore, the nuance of survey data allows Sprint to [REDACTED].³⁴

Daily IQ is routinely identified as one of the Sprint Competitive Intelligence Team’s primary research tools,³⁵ and Sprint executives regularly reference the Daily IQ survey.³⁶ As a survey conducted every day of the year, Sprint can use Sprint IQ data to track these switching preferences at exact instances of time, and compile these detailed and quick data over longer periods.³⁷

²⁸ TMUS-FCC-01914010.

²⁹ TMUS-FCC-04376806. Note that DISH and BVZ cite and discuss this email exchange, but they do so in a misleading way by failing to mention T-Mobile’s use of HarrisX (Nielsen) survey data. DISH Letter at 5 and BVZ Response at 7 citing TMUS-FCC-01914010.

³⁰ SPR-FCC-06835781 at SPR-FCC-06835786 (“ [REDACTED]”).

³¹ SPR-FCC-03939883 at SPR-FCC-03939884.

³² SPR-FCC-10628674 at SPR-FCC-10628782; SPR-FCC-09469082 at SPR-FCC-09469088.

³³ SPR-FCC-01329810 at SPR-FCC-01329813.

³⁴ SPR-FCC-10628674 at SPR-FCC-10628782.

³⁵ SPR-FCC-09259736 at SPR-FCC-09259779; SPR-FCC-10639919 at SPR-FCC-10639942 to 9943.

³⁶ SPR-FCC-00983395 at SPR-FCC-00983399; SPR-FCC-06017115; SPR-FCC-09235502 at SPR-FCC-09235503

³⁷ SPR-FCC-03939883 at SPR-FCC-03939884.

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c. The Applicants use industry metrics such as SoGA to analyze switching.

Industry metrics such as SoGA and SoDA provide the most complete view of subscriber flows from the general switching pool to individual carriers (SoGA) and from individual carriers to the general switching pool (SoDA), but are available less often than the other sources.³⁹

The Applicants make heavy use of these industry metrics in the ordinary course. For instance, T-Mobile has

⁴¹ More generally, it analyzes SoGA and deactivation data

⁴⁴ All wireless providers track and report SoGA, and industry analysts consider it an important signal of company health.

Sprint also routinely uses SoGA to measure customer switching and performance.⁴⁵ Sprint’s internal documents show that SoGA numbers do not match porting numbers. For example, a Sprint document laments that,

⁴⁶ This observation is followed by a statement that “

³⁸ SPR-FCC-01329810 at SPR-FCC-01329813.

³⁹ See, e.g., TMUS-FCC-04247371 at TMUS-FCC-04247371 (“
.”).

⁴⁰ TMUS-FCC-05468686.

⁴¹ TMUS-FCC-08012137.

⁴² TMUS-FCC-05616321; TMUS-FCC-07439030; TMUS-FCC-01883864.

⁴³ See, e.g., TMUS-FCC-05785376.

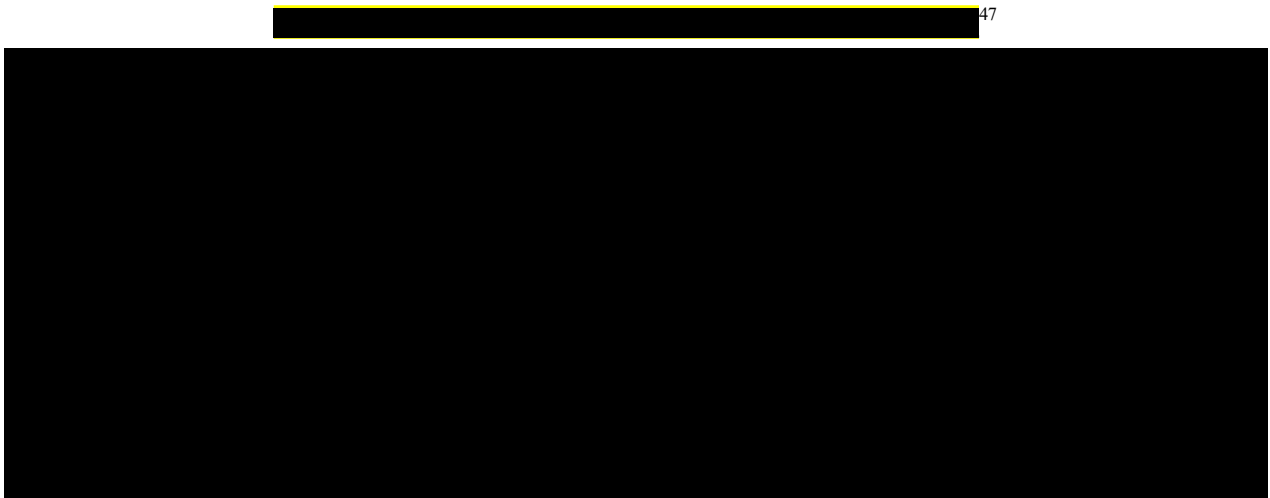
⁴⁴ See, e.g., TMUS-FCC-06092110.

⁴⁵ See, e.g., SPR-FCC-03041445 at SPR-FCC-03041446 (“
”); SPR-FCC-00995685 at SPR-FCC-00995695 (“
”).

⁴⁶ SPR-FCC-03041445 at SPR-FCC-03041446.

[REDACTED]. This further demonstrates that net ports alone do not provide a full picture.

SoGA and SoDA only provide aggregated switching numbers and thus cannot identify the specific subscribers who switch between individual carriers. They nevertheless give the most comprehensive and reliable view of overall subscriber gains. T-Mobile thus uses them to correct misleading impressions given by comparable porting data metrics. For instance, see Figure 4.



These charts demonstrate that both the levels of and changes in porting data (share of port-ins or “SoPI”) differ from all switching data (SoGA). Porting data over-index subscriber gains by [REDACTED] and under-index subscriber gains by [REDACTED]. Furthermore, as explained in the text of Figure 4, [REDACTED] change in SoPI does not correspond to changes in its SoGA. This is due to the bias in porting data caused by porting incentives.

d. The Applicants use or have used Facebook data (often with adjustments) to analyze switching.

Facebook’s Actionable Insights (“FAI”) and Flow Share (“FFS”) data enable the Applicants to determine how customers move between providers, giving the Applicants a more complete view of switching by including “[REDACTED]”⁴⁸ This more detailed view allows for analyses that are closer to diversion, with more specific switching and views of non-porters, who comprise most switchers.

T-Mobile uses FAI and FFS data in the ordinary course to evaluate switching behavior, in part because, unlike porting data, FAI and FFS data have the “[REDACTED]”⁴⁹ As one T-Mobile presentation notes, “[REDACTED]”⁵⁰ For instance, T-Mobile uses FFS data to look at switching percentages between various mobile wireless brands⁵¹ and the SoGA of those brands.⁵² T-Mobile

⁴⁷ TMUS-FCC-05800341 at TMUS-FCC-05800343.

⁴⁸ TMUS-FCC-00711808 at TMUS-FCC-00711825.

⁴⁹ TMUS-FCC-00711808 at TMUS-FCC-00711814. *See also* TMUS-FCC-07762563 at TMUS-FCC-07762566.

⁵⁰ TMUS-FCC-07762563 at TMUS-FCC-07762566.

⁵¹ TMUS-FCC-07534561 at TMUS-FCC-07534576.

⁵² TMUS-FCC-01921550 at TMUS-FCC-01921553.

also uses Facebook data for more targeted switching analyses, such as to analyze [REDACTED]

⁵³

Sprint has also used FAI data to evaluate switching behavior, including the success of its device and promotional offerings.⁵⁴ As one Sprint employee explained about Facebook data,

“[REDACTED]

”⁵⁵ Accordingly, Sprint has used FAI data to determine where switchers are coming from and why. For example, Sprint determined it was “[REDACTED]

”⁵⁶ In another example, a Facebook representative explained that [REDACTED]

[REDACTED]⁵⁷ In response to this report, a Sprint executive requested that the next report include information for “[REDACTED]”⁵⁸

According to internal emails, Facebook data can be used to identify customers who are likely to churn “[REDACTED]”⁵⁹

However, because more T-Mobile and Sprint subscribers use Facebook than subscribers of other carriers do, these data are also biased, although not as badly biased as porting data. This bias can be seen when comparing the difference between shares based on reported subscribership and shares based on Facebook data, seen in Figure 5.

⁵³ TMUS-FCC-07576089. This presentation also notes that the switching rates shown by Facebook “[REDACTED]” *Id.* at TMUS-FCC-07576090. This is not surprising, considering an email from a couple of months later explains [REDACTED] TMUS-FCC-07652903.

⁵⁴ *See, e.g.*, SPR-FCC-04207886 at SPR-FCC-04207887; SPR-FCC-05045151 at SPR-FCC-05045157.

⁵⁵ SPR-FCC-08936106 at SPR-FCC-08936106.

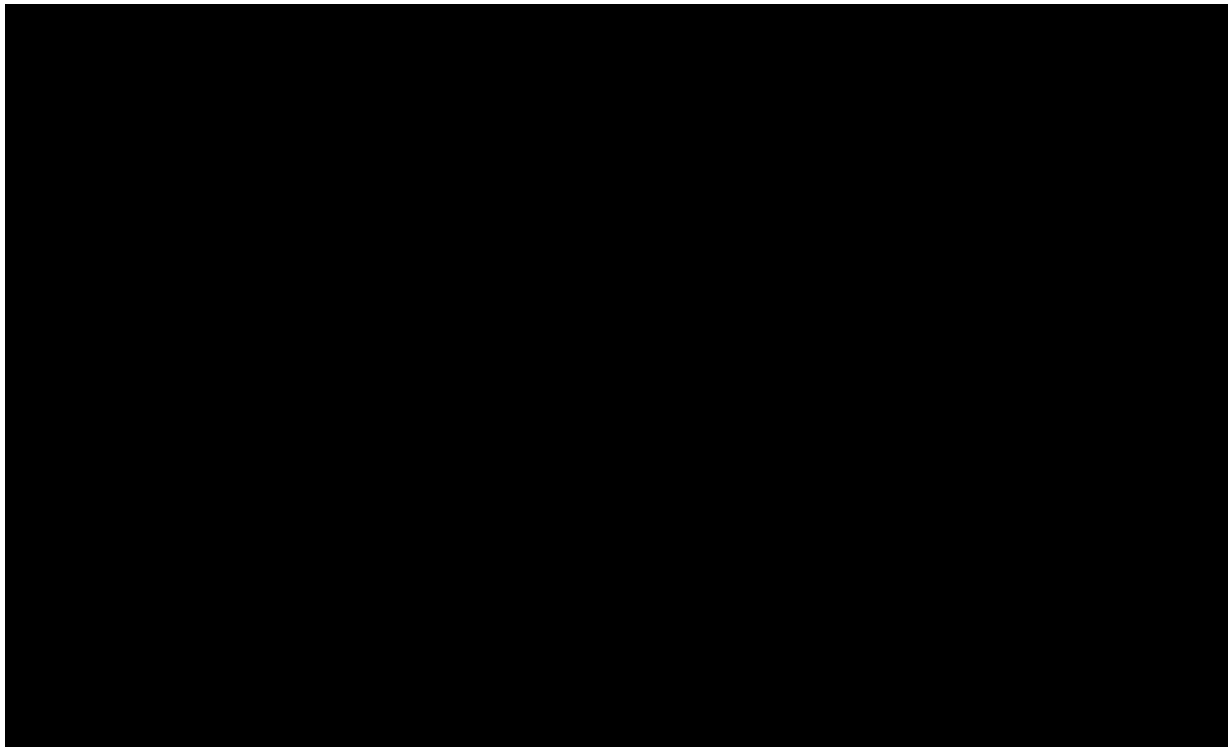
⁵⁶ SPR-FCC-05045151 at SPR-FCC-05045155.

⁵⁷ SPR-FCC-04622199.

⁵⁸ *Id.* at SPR-FCC-04622199.

⁵⁹ SPR-FCC-06179099 at SPR-FCC-06179099 (emphasis in original).

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The Applicants' documents show that they recognize this bias:

- A T-Mobile presentation explains that “[REDACTED]”⁶¹
- A T-Mobile evaluation of Facebook data notes the data have “[REDACTED]”⁶²
- Another T-Mobile presentation using Facebook recognizes the “[REDACTED]” and despite the fact that T-Mobile “normalized” the data for these biases, it nevertheless instructs that the data should only “[REDACTED]”⁶³
- A Sprint presentation demonstrates that Facebook data [REDACTED]⁶⁴
- Another Sprint presentation lays out [REDACTED]⁶⁵
- In an email, a Sprint manager explained that Facebook data are skewed based on the “[REDACTED]”⁶⁶ The employee suggested the best

⁶⁰ See backup materials “[REDACTED]” in under Analyses\Figure 5.

⁶¹ TMUS-FCC-00711808 at TMUS-FCC-00711814.

⁶² TMUS-FCC-00208163 at TMUS-FCC-00208163.

⁶³ TMUS-FCC-01921550 at TMUS-FCC-01921555.

⁶⁴ SPR-FCC-09281257 at SPR-FCC-09281262.

⁶⁵ SPR-FCC-10579042 at SPR-FCC-10579044.

⁶⁶ SPR-FCC-05680446 at SPR-FCC-05680446.

answer could be found by using survey data in conjunction with Facebook data.⁶⁷ In fact, Sprint has found this bias makes Facebook [REDACTED]. For example, in an email exchange, one Sprint employee notes that Facebook data are “[REDACTED]” and another Sprint employee responds that [REDACTED].⁶⁸

e. The Applicants look at porting data, but not to estimate diversion.

As explained above, diversion ratios measure the reaction of consumers to price or quality changes by the original carrier. For purposes of evaluating the merger between the Applicants, the relevant question is how subscribers react to a price or quality change by T-Mobile or Sprint. As described below, porting data do not accurately capture all switching between providers and include subscriber switching for reasons other than isolated price or quality changes by a single firm, and thus are ill-fitted to estimate diversion.

The Applicants’ internal documents show that they often look at some porting metrics. However, the metrics the Applicants turn to are not proxies for diversion; they are generally porting ratios and net porting between only two parties and changes in porting shares.

Porting ratios measure subscriber movement between two carriers that occur in opposing directions by combining both sets of movements into a single number reflecting the relationship between the two. Net ports measure the raw number of subscribers who port their number by netting port-outs and port-ins. Porting ratios and net ports can be analyzed between one provider and all other providers, or between two specific providers. For example, if 11 subscribers port from T-Mobile to Sprint, and 10 subscribers port from Sprint to T-Mobile, the Sprint-T-Mobile porting ratio would be 1.10 (11/10) for the period considered. The net ports from T-Mobile to Sprint would be 1 (11 port-ins minus 10 port-outs). These metrics help the Applicants track their performance by providing information on whether the Applicants are winning or losing porting subscribers from a single competitor or from all competitors.

Porting shares are the percentage of port-ins or port-outs captured by each provider. They answer the following questions: of all the customers who port during a particular period, what percentage of porting subscribers did a provider capture (SoPI), or what percentage of subscribers ported away from the provider (share of port-outs, or “SoPO”)? Accordingly, these metrics help the Applicants understand how the rate at which they are winning and losing porting subscribers compares to other providers.

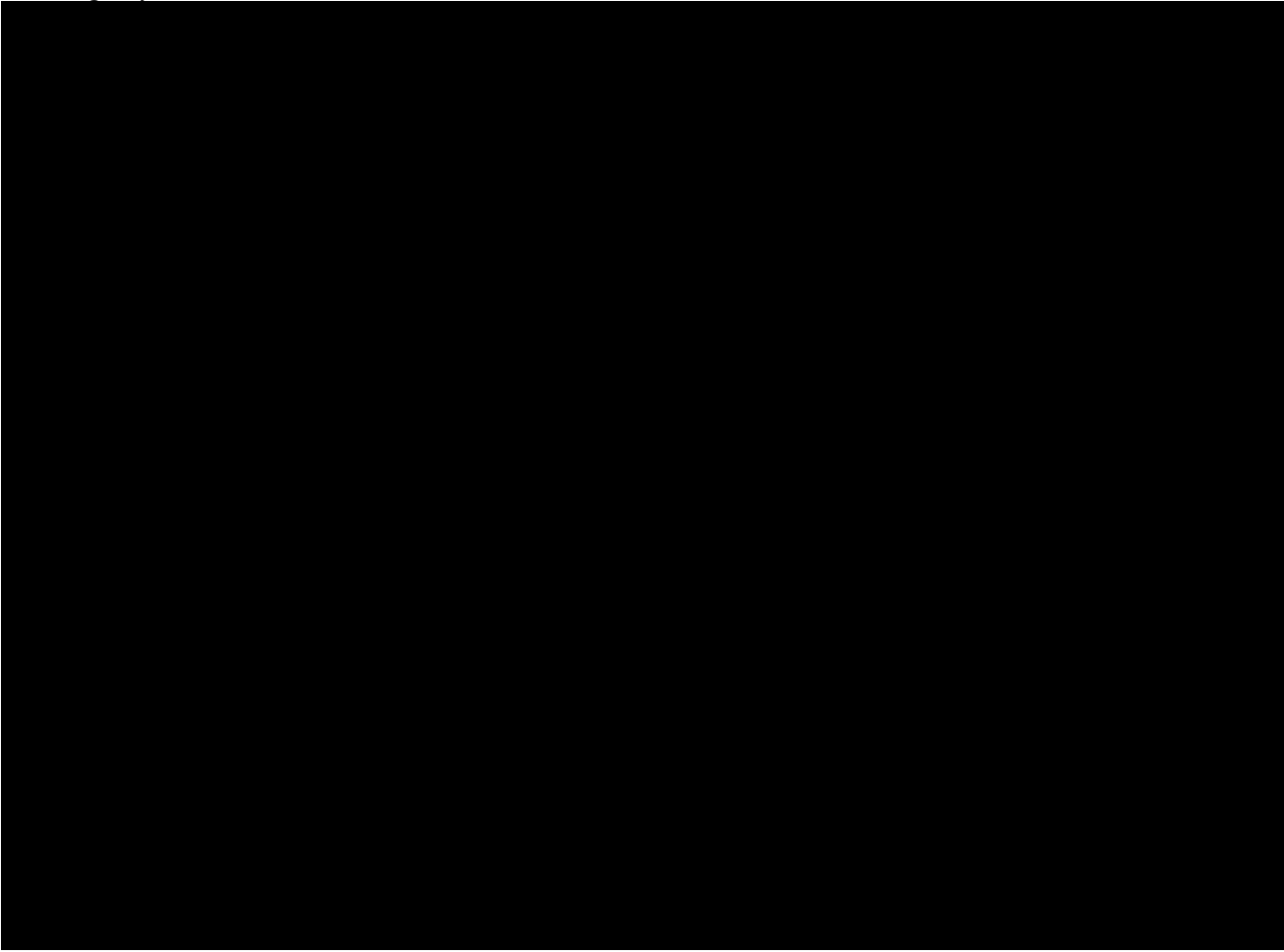
However, as explained in detail below, none of these metrics provide the information needed to calculate diversion ratios. Each fails to provide the complete picture of porting (let alone switching) between various providers that would be necessary to understand the proportions of subscribers that move between the carrier making the price or quality change and all other carriers.

Furthermore, as with all switching data, these metrics also include subscriber switching for reasons other than isolated price and quality changes by a single firm. Even if one looks at the marginal change in these metrics during a promotional period, not all of the change in porting during the that period would necessarily be in reaction to the promotion. As seen in Figure 6, it is very common for multiple promotions, or price changes, to occur simultaneously. Such multiple simultaneous or near-simultaneous promotions make it difficult or impossible to derive diversion

⁶⁷ *Id.* [REDACTED]

⁶⁸ SPR-FCC-03065981 at SPR-FCC-03065981.

ratios from the data, because diversion ratios measure the response to a *single* price (or quality) change by one firm.



Mobile wireless service providers also constantly make improvements to their networks, meaning quality changes occur in conjunction with these frequent price changes. To understand the precise effect of a single change, the effect of all of the other simultaneous changes must be considered. Neither Applicant performs such an analysis with the porting data metrics described above. Thus, while these metrics are a useful proxy for analyzing overall competitive positions among porting subscribers—hence why the Applicants do reference them often—the Applicants’ use of them does not demonstrate that they use porting data in a way similar to estimating diversion.

i. Porting ratios and net ports do not measure diversion.

Net ports and porting ratios do not by themselves show the proportion of porting subscribers moving between a single provider and *each* other provider in the market—they only provide a view of porting between two competitors or between a single competitor and the rest of the aggregated market. Thus, they cannot be used by themselves to determine the proportion of ports a single firm wins or loses from each of its competitors, which is at the heart of diversion ratios.⁷⁰

⁶⁹ TMUS-FCC-00835662 at TMUS-FCC-00835664.

⁷⁰ Even if one were to aggregate various porting metrics in an attempt to determine porting flows throughout the market, such an analysis would need to isolate reactions to a single change in price or quality, determine the

For instance, assume that after a price increase by T-Mobile, the Sprint-T-Mobile porting ratio changes from 1.10 (11/10) to 1.33 (12/9), and Sprint's net ports from T-Mobile change to 3 ($12 - 9 = 3$). Although these changes may capture in part the effect of the price change, they are not measures of diversion. First, they would not isolate switches that occurred only because of the price increase. Second, these metrics fail to provide any information about how the change in porting between Sprint and T-Mobile compares to the change in porting between the Applicants and other providers. For example, the porting ratio change between the Applicants could be much smaller than the porting ratio change between T-Mobile and Verizon or between T-Mobile and AT&T resulting from the same price increase. Without this comparison, the porting ratio is nothing like a diversion ratio because it does not provide information on the proportion of the marginal switchers that went to individual providers.

Finally, the price increase by T-Mobile may not be the only change in price or quality that occurs in the period in which the porting ratio changed. For instance, the T-Mobile price increase may coincide with or be quickly followed by an AT&T promotion. Some Sprint customers that would have ported to T-Mobile may instead port to AT&T due to the promotion. Continuing with the above example, assume that the porting ratio changed because one additional customer ported from T-Mobile to Sprint and one fewer customer ported from Sprint to T-Mobile. However, while the additional customer who ported from T-Mobile to Sprint did so because of T-Mobile's price increase, the customer that would have switched to T-Mobile from Sprint instead switched to AT&T because of the AT&T promotion, not because of T-Mobile's price increase. Thus, attributing the complete porting ratio or net port change to the T-Mobile price change would be inaccurate.

ii. Porting share changes also do not measure diversion.

The share of total ports won or lost does not offer insights into where subscribers are switching to or from—it merely reveals the percentages of the overall volume of porters in the market that a brand is winning and losing. Thus, like net ports and porting ratios, share of ports cannot be used to determine the proportion of ports a single firm wins or loses from each of its competitors, and thus fail to provide the same information as diversion ratios.

For example, if T-Mobile's SoPO increased as a result of it raising its price, looking at port-out shares would only show the volume of customer loss. It would not provide information on the proportion of its former subscribers ported to each other provider. Nor would it show whether they did so in response to the price increase.⁷¹ Similarly, if T-Mobile's share of port-ins decreased due to a price increase, looking at T-Mobile's SoPI would not identify from which carriers T-Mobile would have ported more customers absent the price increase. SoPI and SoPO are useful metrics for what percentage of porters T-Mobile is winning and losing overall, but these indicators do not provide the information necessary to derive diversion. Using them in the ordinary course of business does not indicate that they are used to measure diversion.

Furthermore, as with net ports and porting ratios, changes in porting shares may capture multiple overlapping price or quality changes. For example, assume T-Mobile and AT&T both increase price during the same period. During that period, T-Mobile's share of port-outs increases and Sprint's share of port-ins increases. It would be a mistake to equate such an analysis to a

motivation for switching, and account for the significantly biased data to appropriately estimate diversion. DISH has not shown the Applicants perform an analysis anything like this in how they look at porting data.

⁷¹ Even if T-Mobile were to look at changes in SoPI in conjunction with changes in SoPO, which DISH has not shown it does, T-Mobile could not reliably conclude that customers leaving T-Mobile ported to other providers in the same proportion as SoPI gain. For instance, all customers porting out from T-Mobile could theoretically port in to AT&T. However, AT&T could also lose some potential port-ins from Verizon, meaning their change in SoPI would not simply reflect the increase in port-ins from T-Mobile.

diversion analysis that shows a price increase by T-Mobile led to subscribers porting to Sprint, because it is not a given that subscribers moved between T-Mobile and Sprint. In the extreme case, all of the marginal T-Mobile port-outs could port to Verizon, while all of the marginal port-ins to Sprint port from AT&T in response to AT&T's price increase. SoPI and SoPO measure porting gains and losses from all carriers combined, diversion requires determining specific carrier.

f. The Applicants' documents recognize that porting data are biased.

As noted above, porting data do not capture all subscribers switching between mobile service providers. In fact, T-Mobile documents show that [REDACTED] of subscribers, including T-Mobile subscribers, switching between carriers port their number.⁷² In one stark example, T-Mobile found that [REDACTED] ported their number.⁷³ Moreover, porting subscribers may react differently to price or quality changes than non-porting subscribers, in which case porting data changes would be a biased representation of total switching changes. Documents described below demonstrate that the Applicants have recognized the source of this bias, that the bias causes substantial deviation between porting and total switching data, and that the Applicants take steps to account for and attempt to correct this bias.

i. The Applicants' documents show porting data account for a subset of switchers that are unrepresentative of all switchers, particularly MVNO and prepaid switchers.

An email from Mark Roettgering, T-Mobile's Senior Vice Present of Commercial Strategy and Decision Analytics, explains that "[REDACTED]

[REDACTED]"⁷⁴ Mr. Roettgering has explained this is because only a subset of switchers port their number and promotional activity can manipulate porting activity and cause porting and non-porting switching rates to deviate.⁷⁵ As seen in Mr. Roettgering's email, other data, such as those from Nielsen (HarrisX) surveys, are used to adjust for porting data bias.⁷⁶

Similarly, in an email to T-Mobile executives, Doug Chartier, T-Mobile's Senior Vice President of MVNO, IoT, and National Accounts, explained that "[REDACTED]

⁷² TMUS-FCC-05436856 at TMUS-FCC-05436858 ("[REDACTED]"). See also TMUS-FCC-04252052 at TMUS-FCC-04252052 ("[REDACTED]"); TMUS-FCC-07652903 at TMUS-FCC-07652903 ("[REDACTED]"); TMUS-FCC-07568239 at TMUS-FCC-07568261 ([REDACTED]). See also TMUS-FCC-06360359 at TMUS-FCC-06360379; TMUS-FCC-04789609 at TMUS-FCC-04789630, 9631; and TMUS-FCC-06374356 at TMUS-FCC-06374377, 4378.

⁷³ TMUS-FCC-07652903 at TMUS-FCC-07652903.

⁷⁴ DISH Letter at 7, citing TMUS-FCC-01914010.

⁷⁵ See also Declaration of Mark Roettgering, ¶ 3 (Attachment C to letter from Nancy Victory, Counsel for T-Mobile, to Marlene Dortch, FCC, WT Docket No. 18-197 (Feb. 7, 2019)) ("Roettgering Declaration") ("A principle problem is that only a minority of customers port their numbers when switching carriers, and T-Mobile has found that behavior of porting customers differs substantially from the behavior of non-porting customers... [p]orting behavior has shown extreme susceptibility to manipulation by carrier promotions (e.g., "\$150 off a phone if you port your number") and thus requires significant post-processing and contextualization in order to correctly interpret day-to-day variations in porting flows.").

⁷⁶ TMUS-FCC-01914010 at TMUS-FCC-01914010 ("Gavin and I just got off the phone with Nielsen and are trying to get survey data to help us triangulate.").

██████████.”⁷⁷ Thus, T-Mobile recognizes that porting-based promotions distort the accuracy of porting data because they lead to divergent behavior between porting switchers and non-porting switchers. Such promotions would likely increase a carrier’s share of SoPI by increasing the number of subscribers that port, but they would not increase the amount of non-porting switchers, and thus would lead to a smaller increase in SoGA.⁷⁸

ii. The Applicants’ documents demonstrate the deviation of porting data from all switching data is caused by porting data bias.

The Applicants’ documents show the extent to which porting data’s biases cause them to deviate from switching data, especially for switching within the prepaid segment. For example, T-Mobile creates ██████████. As seen in Table 3, the recent reports in the record demonstrate ██████████

██████████⁷⁹

	Sprint ⁸⁰					MetroPCS					T-Mobile				
Month	SoPI		SoGA			SoPI		SoGA			SoPI		SoGA		
Jan. 2018	████	████	████	████	████	████	████	████	████	████	████	████	████	████	████
Feb. 2018	████	████	████	████	████	████	████	████	████	████	████	████	████	████	████
Mar. 2018	████	████	████	████	████	████	████	████	████	████	████	████	████	████	████
Apr. 2018	████	████	████	████	████	████	████	████	████	████	████	████	████	████	████
May 2018	████	████	████	████	████	████	████	████	████	████	████	████	████	████	████
Jun. 2018	████	████	████	████	████	████	████	████	████	████	████	████	████	████	████
Jul. 2018	████	████	████	████	████	████	████	████	████	████	████	████	████	████	████

Other T-Mobile documents show T-Mobile identifying the disparity between porting and more complete switching data in order to avoid misperceptions based on porting data alone, and that the difference in the competitive view provided by these sources can be large. For example:

- One email explains that “██████████
██████████
██████████.”⁸¹ This demonstrates that

⁷⁷ TMUS-FCC-00793401 at TMUS-FCC-00793401.

⁷⁸ As a simplified example, assume that ten subscribers plan to switch to Sprint in a given period out of a total industry switching pool of 50. Five of the subscribers switching to Sprint plan to port their number and five plan not to port their number, and the same proportion holds for all industry switchers. Due to a porting promotion by Sprint, an additional subscriber switches to Sprint instead of another provider and ports her number, such that a total of 11 customers switch to Sprint. Sprint’s SoPI would increase by 4% (from 5/25 to 6/25), while its SoGA would increase only 2% (from 10/50 to 11/50). Porting data would thus overstate the effect of the promotion on Sprint’s SoGA.

⁷⁹ TMUS-FCC-02447259 at TMUS-FCC-02447260 (January 2018); TMUS-FCC-01099438 at TMUS-FCC-01099439 (February 2018); TMUS-FCC-01103659 at TMUS-FCC-01103660 (March 2018); TMUS-FCC-01649797 at TMUS-FCC-01649798 (April 2018); TMUS-FCC-06377387 at TMUS-FCC-06377388 (May 2018); TMUS-FCC-06527885 at TMUS-FCC-06527886 (June 2018); TMUS-FCC-07501117 at TMUS-FCC-07501118 (July 2018).

⁸⁰ The cited reports do not provide ██████████

⁸¹ TMUS-FCC-00711339 at TMUS-FCC-00711339. The email goes on to explain that “██████████
██████████.” *Id.*

T-Mobile is careful not to equate porting data (SoPI) with total switching data (SoGA) due to changes in how many total switchers port.

- Another email notes that the difference in the change in T-Mobile’s SoGA and the change in its SoPI stems from the fact that “[REDACTED]”.⁸² In other words, the change in T-Mobile’s share of port-ins looked [REDACTED] than its SoGA because [REDACTED].
- One presentation explains that the “key limitation” of porting data is that “[REDACTED]”.⁸³
- Other documents show the divergence between porting data and total switching data. For instance, one document notes that “[REDACTED]”.⁸⁴

Similarly, Sprint documents demonstrate the difference between porting and non-porting switching data:

- A Sprint document discussing the same source for porting data that T-Mobile uses (Comlink) notes that “[REDACTED]”.⁸⁵
- Another Sprint document highlights the divergence between porters and overall switchers: “[REDACTED]”.⁸⁶
- A Sprint presentation analyzing subprime gross adds demonstrates how ports and non-ports subscriber additions do not correlate over time.⁸⁷

iii. The Applicants’ documents show them accounting for and attempting to correct for porting data bias.

Not surprisingly, when the Applicants extrapolate the readily available porting data to determine total switching, they use other data sources to adjust porting data.⁸⁸ For instance, as a T-Mobile employee explained in an email sending summary statistics of industry shares of both gross adds and port-ins, T-Mobile [REDACTED].⁸⁹ This adjustment confirms that T-

⁸² TMUS-FCC-02454561 at TMUS-FCC-02454561 (emphasis in original).

⁸³ TMUS-FCC-00711808 at TMUS-FCC-00711814. The same document later explains that “[REDACTED]”. *Id.* at TMUS-FCC-00711832.

⁸⁴ TMUS-FCC-02454562 at TMUS-FCC-02454567. *See also* TMUS-FCC-07530684 at TMUS-FCC-07530709 (“[REDACTED]”).

⁸⁵ SPR-FCC-06676630 at SPR-FCC-06676630. *See also* SPR-FCC-05930527 (“[REDACTED]”).

⁸⁶ SPR-FCC-04883800.

⁸⁷ SPR-FCC-09469082 at SPR-FCC-09469095.

⁸⁸ This reinforces the fact that Applicants use porting data for directional trends, but not as proxies for total switching levels.

⁸⁹ TMUS-FCC-01648591 at TMUS-FCC-01648592 (“[REDACTED]”).

Mobile recognizes that porting data are not accurate indicators of all switching, since, if they were, no adjustment would be necessary.⁹⁰ Moreover, multiple emails attaching the monthly report that uses this adjustment note that the adjustment may not be fully accurate, including due to promotional activity:

- One email notes that, because some carriers offer non-porting promotions while other carriers offer porting promotions, [REDACTED].⁹¹
- Another email notes that the SoGA estimate may be “[REDACTED]”.⁹²
- Similarly, one email warns that “[REDACTED]”.⁹³
- Other emails sometimes note that SoGA and SoDA estimates have been retroactively corrected to match reported figures,⁹⁴ or warn that such an adjustment will have to be made.⁹⁵

Thus, not only does T-Mobile recognize porting data bias, it also recognizes that the adjustment is not always accurate due to porting-based promotions.

Sprint also takes into account the impact of porting data bias, particularly the shift from non-ports to ports that results from porting-based promotions.

- An email summarizing the effect of the “Sprint Says Thanks” promotional campaign summarizes that there was a “[REDACTED]”.⁹⁶
- A document shows Sprint taking account the effect of a “[REDACTED]” when modeling the effect of a porting promotion.⁹⁷

⁹⁰ Note that this adjustment demonstrates that Sprint’s share of prepaid port-ins ([REDACTED]) drastically [REDACTED] its estimated share of gross adds ([REDACTED]), indicating that the bias in porting data [REDACTED] switching to Sprint prepaid and thus switching from T-Mobile to Sprint prepaid brands. *Id.* at TMUS-FCC-01648591 (figures fully visible in TMUS-FCC-06377387 at TMUS-FCC-06377388).

⁹¹ TMUS-FCC-01648591 at TMUS-FCC-01648592 (“[REDACTED]”).

⁹² TMUS-FCC-01005196 at TMUS-FCC-01005196.

⁹³ TMUS-FCC-01555928 at TMUS-FCC-01555928.

⁹⁴ TMUS-FCC-07374890 at TMUS-FCC-07374890 (“[REDACTED]”); TMUS-FCC-07501115 at TMUS-FCC-07501115 (“[REDACTED]”).

⁹⁵ TMUS-FCC-06527882 at TMUS-FCC-06527884 (“[REDACTED]”).

⁹⁶ SPR-FCC-08510136 at SPR-FCC-08510136.

⁹⁷ SPR-FCC-05854596.

- In an email chain discussing a potential promotion, one Sprint employee explains that “[REDACTED]”⁹⁸

Neither Applicant takes porting data at face value. Both have identified mechanisms that cause significant bias in these data. That bias is demonstrated by the deviation of porting data from total switching data seen in the Applicants’ documents, particularly in the prepaid segment. The Applicants take this bias into account when analyzing porting data, and even take steps to correct for it when feasible.

g. The Applicants do not use porting data to analyze all switching; more representative sources are used when they are available.

The Applicants use porting data because of their frequent availability, which allows porting data to provide information in response to market changes without much lag.⁹⁹ But because porting data reflect switching of an unrepresentative portion of the market, the Applicants can only use these data to understand directional changes caused by those market changes. When considering the impact of all switching, the Applicants prefer to use the more representative data sources described above, which requires them to wait until those sources become available. For instance, one Sprint document notes that “[REDACTED]”

[REDACTED]”¹⁰⁰ Similarly, a T-Mobile employee explained that “[REDACTED]”¹⁰¹

In fact, when the Applicants do attempt to use porting data to understand total switching behavior, the Applicants adjust porting data to account for the data’s bias. For example, T-Mobile creates [REDACTED].¹⁰² These reports focus on porting-based metrics. Where they do extrapolate porting data to all switching, T-Mobile adjusts the porting data in recognition of the data’s bias. In particular, T-Mobile attempts to project SoGA due to the importance placed on it by financial analysts. Because T-Mobile recognizes that porting data are not representative of all switching, it uses [REDACTED].¹⁰³ This allows T-Mobile to understand how changes in porting data translate into changes in total switching data.

Notably, these corrections show that porting data [REDACTED].¹⁰⁴ Furthermore, these documents also note that these corrections may not always be accurate because SoGA and SoPI changes do

⁹⁸ SPR-FCC-08344848 at SPR-FCC-08344848.

⁹⁹ Roettgering Declaration, ¶ 2 (“The primary advantage of porting data relative to other sources of switching data is that porting data are the only data that are available with a short enough lag after an event to provide T-Mobile with quick feedback on the effects of various initiatives.”).

¹⁰⁰ SPR-FCC-05114480 at SPR-FCC-05114480.

¹⁰¹ TMUS-FCC-04247371 at TMUS-FCC-04247371.

¹⁰² *See, e.g.*, TMUS-FCC-02447259.

¹⁰³ *See, e.g.*, TMUS-FCC-01648591 at TMUS-FCC-01648592 (“[REDACTED]”). *See also* TMUS-FCC-00711339.

¹⁰⁴ TMUS-FCC-00711342 at TMUS-FCC-00711346.

not always match. Instead, T-Mobile has to wait until full switching data are available to get the complete picture.¹⁰⁵

II. DISH’s claims that the Applicants rely heavily on unrepresentative porting data in ways that resemble diversion are wrong.¹⁰⁶

a. DISH cites documents where the Applicants look to porting ratios, net ports, and porting share even though those metrics do not measure diversion.

DISH cites documents in which T-Mobile is analyzing porting ratios and net ports between T-Mobile and another provider without explaining how such documents are relevant to diversion analysis (because they are not).

For example, DISH cites an email exchange between T-Mobile executives for the assertion that “T-Mobile executives at the company’s highest levels [REDACTED]”¹⁰⁷ DISH uses the vague phrase “[REDACTED]” to hide the fact that the discussion is focused on a change in the porting ratio between Sprint and T-Mobile in response to a Sprint promotion. The document does not discuss how this change compares to the corresponding porting changes between Sprint and other providers. Thus, the “porting numbers” DISH refers to are not porting changes that approximate diversion.

Similarly, DISH cites Sprint emails analyzing net ports, total ports (in and out), and total port ratios for multiple carriers.¹⁰⁸ First, DISH claims this shows Sprint puts porting data to “similar use” as T-Mobile, comparing it to a T-Mobile document that [REDACTED].¹⁰⁹ However, the email DISH cites does not even mention promotional activity or any other price or quality change. The document is not using porting data similar to the T-Mobile documents DISH cites, nor does it provide necessary information for diversion.

DISH cites multiple other documents as “additional examples of reports using porting.”¹¹⁰ One of these Sprint documents simply looks at net or total ports but never specifies where customers are switching to or from.¹¹¹ It is impossible to connect these pure volume numbers to diversion. Another set of Sprint documents do include analyses of switching between carriers, but only in the form of porting ratios¹¹² or switching between Sprint and a single other carrier.¹¹³ Finally, while a few emails include porting to and from other carriers, there is no evidence that there is any attempt to account for response to a price change or the simultaneous changes in quality and price happening constantly in the wireless industry.¹¹⁴ Accordingly, while these documents do support the idea that Sprint looks at porting data, none of them show that Sprint uses porting data to perform anything close to a diversion analysis.

¹⁰⁵ TMUS-FCC-06527882 at TMUS-FCC-06527884 (“[REDACTED]”).

¹⁰⁶ See Appendix A for a chart laying out some of the many mischaracterizations of ordinary course documents in the DISH filing.

¹⁰⁷ DISH Letter at 7, citing TMUS-FCC-02376783.

¹⁰⁸ *Id.* at 9, citing SPR-FCC-00000290 and SPR-FCC-00122059.

¹⁰⁹ *Id.* at 8-9, citing SPR-FCC-00000290 and SPR-FCC-00122059.

¹¹⁰ *Id.* at 9, n. 31.

¹¹¹ See SPR-FCC-00002998.

¹¹² See SPR-FCC-04246384 and SPR-FCC-01616032. DISH also cites a T-Mobile report on porting ratios. DISH Letter at 9, citing TMUS-FCC-02464576.

¹¹³ SPR-FCC-00882873.

¹¹⁴ SPR-FCC-00000290; SPR-FCC-00122059.

DISH and BVZ also cite documents discussing porting share.¹¹⁵ DISH avoids confronting the fact that porting shares do not measure diversion by making vague assertions such as claims that T-Mobile executives “[REDACTED],” or that porting data are “closely aligned with price movements.”¹¹⁶ For example, DISH cites a document in which T-Mobile charts SoPI over time and overlays promotions on the chart to claim that “customer port-in and port-out numbers correlate closely to price change.”¹¹⁷ DISH fails to explain how this correlation is relevant to diversion, particularly considering it does not specify how customers actually moved between the carriers in response to the identified promotions. Instead, DISH only notes the possible connection between promotions and porting shares and leaves the reader to wonder how it would inform T-Mobile about diversion. The answer is it cannot use porting share to determine diversion. Moreover, the chart shows an abundance of overlapping promotions, demonstrating how it would be extremely difficult if not impossible to parse the effect of a single promotion for the purpose of a diversion analysis.

Table 4: DISH Cites Many Examples Showing the Applicants Use Porting Ratios, Net Ports, and Porting Share, Which Do Not Resemble Diversion Analysis

Document	Metric Used	Different from diversion because:
SPR-FCC-00771060	Porting Ratio	<ul style="list-style-type: none"> Insight only between two competitors, not <i>each</i> possible brand Fails to account for simultaneous changes in the market (<i>e.g.</i>, there are many overlapping promotions)
SPR-FCC-00882873		
SPR-FCC-00887627		
SPR-FCC-00910278		
SPR-FCC-01616032		
SPR-FCC-04246384		
SPR-FCC-00000290		
SPR-FCC-00122059		
TMUS-FCC-02338784		
TMUS-FCC-02464576		
SPR-FCC-00002998	Net Ports	<ul style="list-style-type: none"> Does not offer insight into motivations for switching. Reflects customers who port for reasons other than price/quality
SPR-FCC-04362565		
SPR-FCC-00771060		
SPR-FCC-00910278		
SPR-FCC-00000290		
SPR-FCC-00122059		
SPR-FCC-04246384		
TMUS-FCC-00211481	Porting Share	<ul style="list-style-type: none"> Reflects the share of total porting customers won or lost, cannot specify which competitors these porting customers come from or flow to
TMUS-FCC-01648593		

¹¹⁵ See, DISH Letter at 3, citing TMUS-FCC-01648593 and DISH Letter at 3 citing TMUS-FCC-00211481.

¹¹⁶ DISH Letter at 15.

¹¹⁷ *Id.* at 5-7, citing TMUS-FCC-01648593 at TMUS-FCC-01648600, 8615.

b. DISH's analysis of Metro's deactivation survey ignores quality as a factor in diversion.

T-Mobile documents demonstrate that the majority of customers switching from MetroPCS to Verizon, AT&T, and Cricket [REDACTED] as the primary reason for switching.¹¹⁸ BVZ cite this same MetroPCS deactivation survey to claim that switching from MetroPCS to Sprint and Boost is more often based on [REDACTED] than switching from MetroPCS to other brands.¹¹⁹ This, they say, shows that the survey evidence suggests high diversion rates between T-Mobile and Sprint once the reason for deactivation is taken into account. However, as IKK have explained, diversion is switching in response to price *or* quality changes.¹²⁰ The Commission has recognized this as well.¹²¹ Moreover, price and quality are not really separable. Consumers switch from lower-quality brands to higher-quality brands when the discount that they get is no longer enough to compensate for the quality they are foregoing. (And vice-versa, consumers switch from higher-quality brands to lower-quality brands when the premium they pay is too much for the additional quality they are getting.) It is thus not at all surprising that consumers moving from lower-quality brands to higher-quality ones indicate that they are switching to get better quality, but that consumers switching from higher-quality ones to lower-quality ones indicate that they are switching to get a better price. BVZ conveniently ignore those who switch based on quality factors and that, when combining “monthly plan cost,” “phone upgrade process or cost” (the reasons used by BVZ), and “coverage or network quality” as the indicated primary reason for switching, customers switching from MetroPCS to Sprint or Boost do so *less* than those switching to Verizon due to price *or* quality.¹²²

118 TMUS-FCC-07675268 at TMUS-FCC-07675290.

¹¹⁹ BVZ Response at 13, citing TMUS-FCC-07675268 at TMUS-FCC-07675290.

¹²⁰ IKK, *Economists' Responses to Questions A and B from Commission Staff*, WT Docket No. 18-197 (Dec. 12, 2018) at 1 (“IKK December 12 Response”).

¹²¹ AT&T/T-Mobile Commission Staff Report, Appendix C, ¶ 10.

122 TMUS-FCC-07675268 at TMUS-FCC-07675290.

c. DISH’s cited charts do not illustrate porting data are used for diversion.

DISH includes several graphics in which T-Mobile documents overlaid promotions onto shares of port-ins.¹²³ While DISH hopes these documents appear to show porting data capturing subscribers’ reactions to price changes, in fact they demonstrate the flaws in using porting data for that purpose. DISH claims these charts “prove that customer port-in and port-out numbers correlate closely to price changes.”¹²⁴ But these charts are actually a useful tool for demonstrating the inherent incompleteness of porting data and their ability to measure diversion. First, the promotions on the chart include porting promotions (e.g., “Offered 50% Off Galaxy S8 With Port-In”). These types of promotions only incentivize users to port their number, and there is no reason to expect they would increase the number of non-porting switchers. Such promotion will likely even cannibalize non-porting switchers by incentivizing them to port when switching. By only capturing changes in porting, they will clearly overestimate the total effect on switching as a result of the promotion.¹²⁵

Furthermore, the charts at best simply show the correlation between price promotions and price changes.¹²⁶ Many reasons for porting other than a price or a quality change are present in the background and affect the share lines in these charts. This helps explain why identical promotions offered at different times are followed by substantially different changes in port-in share. For example, an identical Boost promotion, a 15% discount on Android devices, occurred in both March 2018 and May 2018.¹²⁷ Yet the effect of those promotions was considerably different. The March promotion was followed by [REDACTED], while the May promotion was followed by [REDACTED].¹²⁸ The charts show so many overlapping promotions of all sorts and in all directions that they make it clear the data cannot be used to isolate whose price change is causing a certain effect.¹²⁹ However, that is precisely the type of analysis ABH has done to isolate the effect of price and quality changes while holding other variables constant.

DISH also cites these charts as showing “close alignment between price changes and net port changes, and in showing T-Mobile’s awareness of it,” which DISH claims “directly belies Cornerstone’s insistence that such an analysis is impossible.”¹³⁰ In doing so, DISH confuses what the charts are showing with a measure of diversion. ABH does not argue that a correlation between pricing promotions and porting rate changes cannot be analyzed, but rather that such analyses cannot be used to determine diversion ratios.¹³¹ The charts cited by DISH simply show the change in firms’ share of port-ins in relation to promotions. They do not explain how the relative flows

¹²³ DISH Letter at 6 citing TMUS-FCC-01648593 at TMUS-FCC-01648600; *id.* at 7 citing TMUS-FCC-01648593 at TMUS-FCC-01648615.

¹²⁴ BVZ Response at 5.

¹²⁵ Even in the case of non-porting promotions, the reaction to the promotion of customers that port may be different than the reaction by customers who do not port. In that case, the change in port-in shown in the document shares would not be the same as the change in total gross additions.

¹²⁶ Note that this means that T-Mobile also does not account for any changes in quality which may be driving switching decisions.

¹²⁷ TMUS-FCC-01648593 at TMUS-FCC-01648615.

¹²⁸ A similar point could be made about instances in the chart where a promotion is followed by a counterintuitive drop in share of port-ins.

¹²⁹ As ABH have explained, “[g]iven the high frequency of pricing promotions in the industry, we are not aware of isolated pricing or promotional events that could be used to cleanly estimate diversion ratios.” ABH, *Response to DISH and CWA Comments*, ¶ 18 (Dec. 18, 2018) (Attachment A to letter from Nancy Victory, Counsel for T-Mobile, to Marlene Dortch, FCC, WT Docket No. 18-197 (Dec. 18, 2018)) (“ABH Response”).

¹³⁰ DISH Letter at 6, citing ABH Response, ¶ 18.

¹³¹ ABH Response, ¶ 18.

of customers changed *between* carriers in response to the promotions, which is what is relevant to a diversion analysis. For example, the chart showing postpaid shares of port-ins does not indicate whether T-Mobile’s increase in share of postpaid port-ins after a T-Mobile promotion came from a relative increase in customers porting from Verizon, AT&T, or Sprint.¹³² In fact, the chart demonstrates ABH’s precise concern, that the frequency of promotions in the industry would make teasing out these relative effects extremely difficult.

Finally, these charts show only porting share. They contain no information on where specific customers are flowing to or coming from, just the share of the total porting pool that each brand captures. Even if all the above issues did not apply, the metric these charts measure is not specific enough to be used to estimate diversion.

d. DISH ignores evidence that T-Mobile recognizes the need to supplement porting data to gain insights into switching behavior.

DISH attempts to isolate a few documents that suggest T-Mobile uses porting data to measure the effect of price changes without reservation, failing to recognize that related documents, or sometimes even the same document, caveat the use of porting data. For instance, DISH cites a document referring to [REDACTED]

[REDACTED].¹³³ DISH cites this as further support that T-Mobile executives “attribute porting number changes to price changes.”¹³⁴ However, DISH ignores several related documents that explain why the change in porting is a distorted view of switching between Sprint and T-Mobile:

- A later related email notes that part of the increase is due to “[REDACTED]”¹³⁵
- That email explained that the promotion caused a “[REDACTED]”¹³⁶ Thus, the single day change to the porting ratio between T-Mobile and Sprint discussed in the email cited by DISH overestimated the effect of the promotion. DISH fails to mention this additional context.
- A presentation analyzing the same promotional activity by Sprint, dated a day after the email DISH cites, notes that deactivation data suggested that [REDACTED].¹³⁷
- The same presentation analyzing Sprint’s promotional activity explains that [REDACTED].¹³⁸ That made “[REDACTED]”

¹³² It is also not clear whether the chart includes port-ins from prepaid providers, given a substantial amount of wireless customers do port from prepaid to postpaid services.

¹³³ TMUS-FCC-02338784. A later email in a divergent chain attributes the spike to [REDACTED]. TMUS-FCC-00923858.

¹³⁴ DISH Letter, n. 24.

¹³⁵ TMUS-FCC-00923858 at TMUS-FCC-00923858.

¹³⁶ *Id.*

¹³⁷ TMUS-FCC-04017945 at TMUS-FCC-04017946 (“[REDACTED]”).

¹³⁸ *Id.*

_____,” since it captured customers _____.¹³⁹

- Sprint’s own internal documents show that it _____.¹⁴⁰

In another instance, DISH cites the attachment to an email discussed above in an effort to demonstrate that T-Mobile uses porting data in a similar fashion to estimating diversion.¹⁴¹ DISH cites parts of the document that chart changes in SoPI with promotional activities overlaid on the chart. DISH claims that this shows that “net port changes are closely aligned with price changes.”¹⁴² However, DISH simply ignores the email to which this document is attached, even though that email explains why only looking at the effect of such promotions on porting is not a reliable measure of their effect on all switching. The email states that T-Mobile _____ and cautions that such an adjustment may not be precise due to changes in promotional activity.¹⁴³ Moreover, a document showing a similar chart notes that such analyses cannot be used to estimate SoGA, or all switching, because the high volatility of promotions causes shifts in “_____.”¹⁴⁴

BVZ also cite an email chain in which T-Mobile is grappling with the differences between data sources and BVZ misleadingly describe both the content and the conclusion of the exchange. BVZ present a table from the document showing _____. But they fail to mention that in the exercise to reconcile the different data sources presented, _____ is intentionally and expressly excluded, inflating all of the switching numbers presented.¹⁴⁵

DISH also uses this document to claim that “T-Mobile itself has recognized that its MetroPCS deactivation survey yields _____.¹⁴⁶ However, while the email suggests that the MetroPCS deactivation survey may _____, it does not come to the conclusion that the survey is “_____.” Rather, the exchange indicates that further work needs to be done to reconcile the data.¹⁴⁷ In other words, the email shows that T-Mobile was trying to understand the reasons for the substantial difference between porting data and another source.¹⁴⁸ DISH does not explain how

¹³⁹ *Id.* at TMUS-FCC-04017946, 7948.

¹⁴⁰ SPR-FCC-08510136.

¹⁴¹ DISH Letter at 3, 7, citing TMUS-FCC-01648593 at TMUS-FCC-01648600, 8615.

¹⁴² *Id.*

¹⁴³ TMUS-FCC-01648591 at TMUS-FCC-01648592.

¹⁴⁴ TMUS-FCC-01892374 at TMUS-FCC-01892399 (_____.”).

¹⁴⁵ TMUS-FCC-01906347 at TMUS-FCC-01906347 (“_____”).

¹⁴⁶ BVZ Response at 13.

¹⁴⁷ TMUS-FCC-01906347.

¹⁴⁸ Note that the document shows that data from Facebook align with porting data. *Id.* However, other documents show that Facebook data deviate from MetroPCS porting data. *See, e.g.*, TMUS-FCC-05799528 at TMUS-FCC-05799529 (“_____”). Thus, the alignment of Facebook and porting data in this instance may be spurious. Furthermore, T-Mobile documents also indicate that Facebook over-indexes T-Mobile subscribers. TMUS-FCC-00711808 at TMUS-FCC-00711814 (noting that one issue with Facebook data is that its “_____”).

the MetroPCS deactivation is “contradictory information,” and misleadingly claims that T-Mobile came to a conclusion that the deactivation survey was [REDACTED]

e. DISH mischaracterizes ordinary course documents to support its claim that porting data are reliable.

In its attempts to support the accuracy of porting data, DISH ignores the evidence and simply misinterprets documents. Rather than showing that porting data are an unbiased estimate of switching or diversion, many of the documents DISH cited simply support the entirely unremarkable and undisputed fact that the Comlink porting data T-Mobile uses match T-Mobile’s internal porting data. In other words, porting data are accurate measures of porting. For example:

- DISH quotes T-Mobile’s then Director of Mobile Ecosystem Analytics, Gavin Olmstead, as saying “[REDACTED]”¹⁴⁹ The email goes on to say that “[REDACTED]”¹⁵⁰ In other words, the document only shows that Comlink’s porting data match with T-Mobile’s internal porting data. It does not suggest that porting data in general are an accurate or unbiased proxy for total switching.
- DISH cites a T-Mobile “Share and Switch Deep Dive” analysis claiming that it “remarkably...includes a strongly favorable assessment of the virtues of porting data,” despite IKK citing the same document as evidence that T-Mobile has found porting data unreliable.¹⁵¹ As IKK notes, the document explains that porting data are unreliable because they have “[n]o visibility into non-porting population.”¹⁵² DISH attempts to combat this point by saying that the document also identifies [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]¹⁵³ Thus, as with the document above, this document simply says that the third-party porting data T-Mobile uses match its internal porting data. DISH’s citation to this document as providing a “favorable assessment of the virtues of porting data” in general is false and misleading.

DISH also cites a Sprint document in which Sprint’s Chief Commercial Officer, Dow Draper, explained that “[REDACTED]”¹⁵⁴ That is precisely what the Applicants have explained. Porting data are used as a directional indicator for switching. Porting data are not precise proxies for switching, due to their bias. Furthermore, Mr. Draper is discussing net ports between Sprint and MetroPCS.¹⁵⁵ As discussed above, an analysis of net ports between two carriers is far from a measure of diversion.

Finally, DISH cites an exchange that suggests that T-Mobile uses porting rates as a proxy for non-porting switching rates, but then fails to note that the suggestion is later refuted. DISH

[REDACTED]”). See also TMUS-FCC-00208163 (noting that one drawback of Facebook data is that “[REDACTED]”).

¹⁴⁹ DISH Letter at 8, citing TMUS-FCC-00211481.

¹⁵⁰ TMUS-FCC-00211481.

¹⁵¹ DISH Letter at 5, citing TMUS-FCC-01909049.

¹⁵² IKK December 12 Response, citing TMUS-FCC-01909049 at TMUS-FCC-01909051.

¹⁵³ DISH Letter at 5, citing TMUS-FCC-01909049 at TMUS-FCC-01909051.

¹⁵⁴ *Id.*, citing SPR-FCC-00910278.

¹⁵⁵ SPR-FCC-00910278.

cites an email exchange between T-Mobile executives Dave Carey and Michael Sievert, in which Mr. Sievert says that [REDACTED]¹⁵⁶ In a later email, Gavin Olmstead explained that “[REDACTED]”¹⁵⁷ He also notes that “[REDACTED]” and that he supplemented the analysis using the Nielsen (HarrisX) survey data due to the limitations of porting data.¹⁵⁸

In addition, DISH and BVZ both fail to mention the effect of non-port to port shifting in response to porting promotions, despite the abundance of evidence in the record on this point.¹⁵⁹ Instead, they mischaracterize documents, cite documents out of context, and make flawed or irrelevant arguments about cited documents.

III. Conclusion

Diversion ratios are an important tool for understanding the competitive impact of a merger. Deriving robust, supported diversion ratios requires data that are (1) representative and (2) can isolate switching based on a particular change in price or quality. ABH’s diversion estimates—built on an expansive and previously unavailable data set—fulfill these requirements. The ABH econometric demand model is the closest that the Commission can get to an ideal method for calculating diversion ratios.

The ABH model is based on an enormous set of panel data comprising more than 50,000 consumers and over 300 million observations from a nationally representative sample.¹⁶⁰ ABH used this extensive and representative data to estimate consumer responsiveness to price and network quality, thereby calculating diversion.¹⁶¹ ABH performed even further econometric analysis on these data using a nested logit regression to take into account potential groups of brands (or “nests”), which allow the data to suggest whether certain brands may be closer or more distant competitors than observable factors (such as quality) might explain.¹⁶² Diversion ratios from that nested logit regression continue to demonstrate significant consumer welfare gains from the merger.¹⁶³ Unlike the flaws in the other data sets discussed in this filing, ABH’s diversion estimates approach the ideal for diversion ratios.

But, again, the Commission can also take comfort in the fact that the merger is still procompetitive when using a wide variety of sources to calculate diversion—the same sources the Applicants themselves use to analyze switching in the ordinary course of business. Even Facebook

¹⁵⁶ DISH Letter at 6, citing TMUS-FCC-02597890.

¹⁵⁷ TMUS-FCC-04252052. Notably, Mr. Olmstead’s role included developing tools and metrics for tracking T-Mobile’s competitiveness in the wireless industry.

¹⁵⁸ *Id.* Note that, without recognizing the connection between this document and the one to which it responds, DISH attempts to downplay Mr. Olmstead’s clarifying email by arguing that it does not explicitly say that porting data are biased. DISH Letter at 5. However, it demonstrates an attempt to correct for porting data’s inaccuracies to find a better estimate of total net adds. At the very least, it raises the question of why T-Mobile would bother paying for and using other data sources and applying them to net ports if porting data are an adequate proxy for all switching.

¹⁵⁹ DISH Letter and BVZ Response.

¹⁶⁰ ABH Diversion Response, ¶ 11.

¹⁶¹ ABH, *Economic Analysis Of The Proposed T-Mobile/Sprint Merger*, WT Docket No. 18-197 (filed Nov. 6, 2019), ¶ 76.

¹⁶² ABH Diversion Response, ¶ 74.


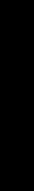




¹⁶³ See Table 1.

data, which has biases the Applicants have acknowledged in their ordinary course documents, show the merger to be procompetitive. Only porting data, which the Applicants’ documents pervasively indicate are unrepresentative and which all record evidence shows to miss an important consumer group that behaves differently from porters, has a contrary result. It would be a mistake to use an outlier, unrepresentative data source to estimate diversion.

Table 1: Consumer Welfare Improvement Per Sub Per Month ('19-'24) and Total Discounted Welfare Gain

Data Source	2019	2020	2021	2022	2023	2024	Total Welfare Gain	Merger Good?
Baseline Case (ABH)								✓
ABH-Nested Logit								✓
HarrisX Mobile Insights								✓
Sprint Brand IQ Survey								✓
SoGA/SoDA Estimates								✓
Subscriber Shares								✓
Facebook Data								✓













APPENDIX A

Documents Cited by DISH and BVZ Do Not Support Claims that Applicants Use Porting Data to Estimate Diversion		
Document	What DISH Claims ¹	What the Document Actually Shows
TMUS-FCC-01909049 	DISH claims this document “includes a strongly favorable assessment of the virtues of porting data,” and that the document identifies “  (DISH Letter at 5 & n.20)	 All this is saying is that the third-party porting data T-Mobile use match its internal porting data.
TMUS-FCC-00211481 	DISH cites this document, and the statement that “   ” to say that T-Mobile uses porting data and to imply porting data are a reliable metric. (DISH Letter at 8 & n.27, 9 n.29)	The document says that the external “industry” porting data match T-Mobile’s internal porting data. It does not suggest that porting data in general are accurate or unbiased proxies for total switching. T-Mobile does not deny using porting data for certain purposes, but the fact that external porting data closely match the internal porting data in no way strengthens DISH’s claim that porting data should be used to estimate diversion.

¹ Letter from DISH Network Corporation, WT Docket. 18-197 (filed January 28, 2019) (“DISH Letter”) and Coleman Bazelon, Jeremy Verlinda, and William Zarakas, *Response to Applicant Filings on Diversion Ratios*, WT Docket No. 18-197 (filed January 28, 2019) (“BVZ Response”)

Documents Cited by DISH and BVZ Do Not Support Claims that Applicants Use Porting Data to Estimate Diversion	Document	What DISH Claims ¹	What the Document Actually Shows
<p>TMUS-FCC-01914010</p> <p>[REDACTED]</p>	<p>In this email, a T-Mobile executive explains that porting data [REDACTED]. The relevant quote says “[REDACTED]”</p> <p>BVZ mischaracterize this document claiming that it “indicate[s] that porting data are particularly accurate with respect to the switching behaviors of postpaid subscribers.” (BVZ Response at 7)</p> <p>DISH attempts to downplay this email’s criticism of porting data by saying that it “simply states the truism that porting, like any data source, becomes less useful the smaller the sample size.” (DISH Letter at 5)</p>	<p>The document indicates that [REDACTED]. In no way does it suggest that porting data are “particularly accurate” with respect to postpaid switching behavior, let alone diversion. BVZ disingenuously equates the statement “X is a better proxy for Z than Y” to “X is a good proxy for Z.”</p> <p>While a previous email in the chain notes that there is a [REDACTED] Thus, DISH inappropriately assigns the email’s criticism of porting data to a reflection of sample size.</p> <p>Finally, this document mentions using Nielsen (HarrisX) data to help make up for the shortcomings of porting data.</p>	<p>This quote says the opposite of what DISH claims. The context shows that the email’s author is saying that T-Mobile focuses on [REDACTED]. The opening line of the follow up email begins: “[REDACTED]”</p> <p>With this caveat, the email does lay out the porting numbers, but only after the author has given the above warning about not generally using porting as their main indicator.</p>
<p>TMUS-FCC-00793401</p> <p>[REDACTED]</p>	<p>DISH claims this document shows that T-Mobile uses porting data “[e]ven for purposes of MVNO metrics.” More specifically, DISH quotes a passage from an email in the exchange, which says that T-Mobile “[REDACTED]” (DISH Letter at 8 & n.28)</p>		

Documents Cited by DISH and BVZ Do Not Support Claims that Applicants Use Porting Data to Estimate Diversion		
Document	What DISH Claims ¹	What the Document Actually Shows
SPR-FCC-00002998 [REDACTED]	DISH says this is an example of a report “using porting data.” (DISH Letter at 9 n.31)	This document looks purely at the volume of customers porting in and out. It is not possible to determine where customers are switching to or from, only the total volume. This shows nothing about estimating diversion using porting data.
SPR-FCC-00910278 [REDACTED]	DISH cites an email where a Sprint executive says that, “[REDACTED].” (DISH Letter at 9 & n.30)	That is precisely what the Applicants have explained: porting data are used as a directional indicator for switching, but are not precise proxies for switching due to their bias.
SPR-FCC-04246384 [REDACTED] SPR-FCC-01616032 [REDACTED] SPR-FCC-00882873 [REDACTED]	DISH cites these documents as “additional examples of reports using porting.” (DISH Letter at 9 n.31)	These documents use porting ratios and net ports. Porting ratios and net ports merely show the head-to-head porting of two brands, but do not show what is necessary for diversion: the <i>proportion</i> of switchers going to each competitor. Additionally, diversion requires measuring a consumer response to a particular change in price or quality, and there is no indication that these reports isolate such changes. These documents show that the Applicants look at porting data, but they do not show that porting is used to estimate diversion.

Documents Cited by DISH and BVZ Do Not Support Claims that Applicants Use Porting Data to Estimate Diversion		
Document	What DISH Claims ¹	What the Document Actually Shows
TMUS-FCC-01648593 	DISH cites a document in which T-Mobile  (DISH Letter at 3 n.9, 6 n.21, 7 n.23)	<p>Rather than showing “ While neither metric is probative for diversion, porting share is even further removed from switching than net ports, not even showing where any specific customers switch to or from.</p> <p>Also, the chart shows  demonstrating how it would be impossible to parse the effect of a single promotion for the purpose of a diversion analysis.</p> <p>Finally, the cover letter to this document explicitly states that  (TMUS-FCC-01648591)</p>
TMUS-FCC-01906347 	BVZ cite this document to claim that T-Mobile has “recognized” that its MetroPCS deactivation survey likely understates switching to Sprint brands. (BVZ Response at 14 n.28)	<p>This conclusion is not supported by the document. Although the email suggests that the MetroPCS deactivation survey may  the email does not come to the conclusion that the survey is “” as DISH misleadingly claims.</p> <p>This document contains porting ratios and net ports, which are not examples of using porting data like diversion.</p> <p>Furthermore, this document was in response to a  A divergent thread off of the same email chain explains that  (TMUS-FCC-00923858). This shift in the mix of porting to non-porting customers due to porting incentives highlights why porting data are an unreliable measure of overall switching.</p>
TMUS-FCC-02338784 	DISH cites this email saying it shows concern about porting between the Applicants,  (DISH Letter at 7 n.24)	

Documents Cited by DISH and BVZ Do Not Support Claims that Applicants Use Porting Data to Estimate Diversion		
Document	What DISH Claims ¹	What the Document Actually Shows
TMUS-FCC-02376783 [REDACTED]	DISH cites this email exchange for the assertion that T-Mobile executives “[REDACTED]” (DISH Letter at 7)	This document is about porting ratios; thus, the “[REDACTED]” DISH refers to are not switching metrics that approximate diversion, just head-to-head comparisons of unrepresentative switching.
TMUS-FCC-02464576 [REDACTED]	DISH cites this documents as an “additional example[] of reports using porting.” (DISH Letter at 9 n.31)	This is yet another report on porting ratios, which do not show the Applicants “estimating customer diversion” as DISH claims they do.

**THE PROPOSED MERGER OF SPRINT AND T-MOBILE IS
PROCOMPETITIVE WHEN EVALUATED USING TWO ADDITIONAL
APPROACHES TO ESTIMATING DIVERSION RATIOS**

Mark Israel, Michael Katz, and Bryan Keating

April 12, 2019

In previous filings, we calculated for each year from 2019 through 2024 how the proposed merger of Sprint and T-Mobile would affect consumer surplus. We did so using several different approaches to estimating diversion ratios, and we showed that the proposed merger is procompetitive when evaluated using a wide variety of diversion ratio estimates.¹

In the present submission, we supplement our prior analysis by considering two additional sets of estimated diversion ratios:

- 1) estimates derived from the nested logit version of the demand model developed by John Asker, Timothy Bresnahan, and Kostis Hatzitaskos (ABH);² and
- 2) estimates derived from Facebook switching data.³

As we have emphasized in previous filings, the ABH model allows for the estimation of true diversion ratios derived from a fully specified demand system—as opposed to assuming that observed switching patterns are representative of diversion ratios—and the ABH model provides the best estimates of the substitution patterns relevant for the analysis of competitive effects that are available in the record of this proceeding.⁴ Relative to other versions of the ABH demand

¹ See Mark Israel, Michael Katz, and Bryan Keating (“IKK”), “Extension of the Israel, Katz, and Keating Analysis to 2019-2020,” (Attachment A to letter from Nancy Victory, Counsel for T-Mobile, to Marlene Dortch, FCC, February 21, 2019, WT Docket No. 18-197) (hereinafter *IKK Extension*), Tables 3 and 4. That filing extends the analysis of Mark Israel, Michael Katz, and Bryan Keating, “Reply Declaration of Mark Israel, Michael Katz, and Bryan Keating,” September 17, 2018, WT Docket No. 18-197.

² John Asker, Timothy F. Bresnahan, and Kostis Hatzitaskos, “Response to DISH’s March 25, Submission,” (Attachment to letter from Regina M. Keeney, Counsel for Sprint, and Nancy J. Victory, Counsel for T-Mobile, to Marlene Dortch, FCC, April 3, 2019, WT Docket No. 18-197), § 2 (specifically, we use the results based on the following nesting structure: {A,V,S,T}, {B,M,C,O}).

³ See the file “FB_Weekly_Flowshare 20180815” in our backup materials.

⁴ *IKK Extension*, Appendix II, § F; Mark Israel, Michael Katz, and Bryan Keating, “Additional Information Regarding the Estimation of Diversion Ratios,” December 14, 2018, WT Docket No. 18-197, (hereinafter *Diversion Ratio Analysis*), § 1.

model, the nested logit version of the model provides additional flexibility that allows the data to determine whether Sprint and T-Mobile brands are particularly close substitutes for one another.

The Facebook data represent an additional data source used by T-Mobile in the ordinary course of business to assess consumer behavior.⁵ The Facebook data cover both consumers who port their numbers when switching carriers and those who do not. Hence, the Facebook data are more representative of overall consumer behavior than are porting data. However, Sprint and T-Mobile customers are disproportionately likely to use Facebook and thus to appear in the Facebook data relative to AT&T and Verizon customers. Consequently, switching rates derived from these data are likely to overstate relative switching between Sprint and T-Mobile and to understate switching between Sprint/T-Mobile and other carriers, and thus to generate misleading results that artificially inflate the projected competitive effects of the merger. To account for this fact, we adjust Facebook data using the same method that T-Mobile applies in the ordinary course of business.⁶ It should be kept in mind that even the adjusted Facebook data are switching data and, for that reason, Facebook-based switching rates are inferior estimates of diversion compared to the estimates derived from the ABH demand model.⁷

Using the methodology applied in our *IKK Extension*, these supplemental sources of diversion ratios generate the estimated consumer surplus changes reported in Table 1 below.⁸

⁵ See, e.g., TMUS-FCC-01921550.

⁶ See TMUS-FCC-01921550, p. 55. Specifically, we use T-Mobile’s calculated “match rate”—the ratio of carrier brand-level Facebook users to total brand-level subscribers—to adjust the switch-in and switch-out rates. For example, when considering switch-out rates, we divide the switching rate to each destination brand by the match rate for that brand. (See backup materials for details.)

Even if one were not to apply this adjustment, the merger simulation indicates that the merger would generate \$■■■■ of welfare gain per subscriber based on our baseline approach to calculating net present value (NPV). (For a description of our NPV calculations, see *IKK Extension*, § 4.B.)

⁷ For further discussion of the distinction between switching rates and diversion ratios, see *Diversion Ratio Analysis* and Mark Israel, Michael Katz, and Bryan Keating, “Porting Data are Biased and Inferior to Both Survey Data and Structural Demand Estimation as a Means of Estimating Diversion Ratios,” February 7, 2019 (Appendix B to letter from Nancy Victory, Counsel for T-Mobile, to Marlene Dortch, FCC, February 7, 2019, WT Docket No. 18-197).

⁸ See backup materials for details, which also report results based on our mean-scaling approach, which are substantially similar to the results presented in Table 1 based on our site-specific-scaling approach. (See also *IKK Extension*, § 4.)

In our backup materials we also consider the extreme sensitivity case in which T-Mobile’s brand-promise and its retail price commitment are assumed to have no effect on New T-Mobile’s pricing incentives, even in the short run. The merger simulation indicates that the merger would generate \$■■■■ of welfare gain per subscriber using diversion ratios derived from ABH’s nested logit model and \$■■■■ of welfare gain per subscriber using diversion ratios derived from adjusted Facebook data, both based on our baseline approach to calculating NPV.

Table 1: Consumer Surplus Change by Year: Site-Specific Scaling (\$/Subscriber/Month)

	2019	2020	2021	2022	2023	2024
IKK Merger Simulation Model with Alternative Diversion Ratios						
[1] <i>ABH Nested Logit Diversion Ratios</i>						
[2] <i>Adjusted Facebook Data</i>						

Notes: Results are for the adjusted Nevo model in the Maintain Case using the site-specific scaling approach to calculating LTE throughput. The model assumes -0.3 industry elasticity, 75% wholesale pass-through rate, and vGUPPI without input substitution. It applies near-term retail and wholesale price constraints. A positive number indicates that the merger is procompetitive.

The magnitudes of consumer surplus changes reported above are in the range of the estimates discussed in the *IKK Extension*⁹ and further support the conclusion that use of diversion ratios derived explicitly from econometric models or from a variety of sources of switching data that are broadly representative of the overall population demonstrate that the proposed merger of Sprint and T-Mobile will benefit consumers and strengthen competition.

⁹ *IKK Extension*, § 4.A.