September 21, 2016

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

> **Re:** ***Business Data Services in an Internet Protocol Environment***, **WC Docket No. 16-143;** ***Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans***, **WC Docket No. 15-247;** ***Special Access for Price Cap Local Exchange Carriers***, **WC Docket No. 05-25;** ***AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services***, **RM-10593**

Dear Ms. Dortch:

I hereby submit this Supplemental Reply Declaration on behalf of Level 3 Communications, LLC and Windstream Services, LLC in this proceeding. I am currently serving as an outside consultant to the above-mentioned parties and am a Senior Consultant for a subsidiary of FTI Consulting.

The attached Supplemental Reply Declaration contains Highly Confidential Information under the Protective Orders and should not be made publicly available. Parties who are admitted to the Protective Orders can request a copy of the Highly Confidential version of this Supplemental Reply Declaration by contacting Mia Guizzetti Hayes at Willkie Farr & Gallagher LLP (mhayes@willkie.com).

Please do not hesitate to contact me at 202-274-4315 if you have any questions regarding this submission.

Sincerely,

Jonathan Baker

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Business Data Services in an Internet	)	WC Docket No. 16-143
Protocol Environment	)	
	)	
Investigation of Certain Price Cap Local	)	WC Docket No. 15-247
Exchange Carrier Business Data Services	)	
Tariff Pricing Plans	)	
	)	
Special Access for Price Cap Local	)	WC Docket No. 05-25
Exchange Carriers	)	
	)	
AT&T Corporation Petition for Rulemaking to	)	RM-10593
Reform Regulation of Incumbent Local	)	
Exchange Carrier Rates for Interstate Special	)	
Access Services	)	

SUPPLEMENTAL REPLY DECLARATION OF JONATHAN B. BAKER
ON COMPETITION AND MARKET POWER
IN THE PROVISION OF BUSINESS DATA SERVICES

Table of Contents

I.   Introduction

1.   I have been asked by Level 3 Communications and Windstream to

reply to various comments submitted in this proceeding on or since

August 9, 2016. This reply supplements the declarations I have previously

submitted in this proceeding.[1]

II.   Potential Competition Does Not Constrain ILECs to Price Business Data Services Competitively

A.   <u>The Presence of One Nearby Rival Is Insufficient to Prevent ILECs from Exercising Market Power</u>

2.   Dr. Israel, Prof. Rubinfeld, and Prof. Woroch (IRW) claim that

"where an ILEC faces at least one competitor, competition is likely to be

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[1] Reply Declaration of Jonathan B. Baker on Competition and Market Power in the Provision of Business Data Services, attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed Aug. 9, 2016) ("Baker FNPRM Reply Decl."); Declaration of Jonathan B. Baker on Competition and Market Power in the Provision of Business Data Services, attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed June 28, 2016) (refiled Jul. 14, 2016) ("Baker FNPRM Decl."); Declaration of Jonathan B. Baker on Market Power in the Provision of Dedicated (Special Access) Services, attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, RM-10593 (filed Jan. 27, 2016) (refiled Apr. 14, 2016) ("Baker Decl."); Reply Declaration of Jonathan B. Baker on Market Power in the Provision of Dedicated (Special Access) Services, attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, RM-10593 (filed Feb. 19, 2016) (refiled Apr. 14, 2016) ("Baker Reply Decl."); Supplemental Reply Declaration of Jonathan B. Baker on Market Power in the Provision of Dedicated (Special Access) Services, attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, RM-10593 (filed Mar. 2, 2016) (refiled Apr. 14, 2016) ("Baker Supp. Reply Decl."); Second Supplemental Reply Declaration of Jonathan B. Baker on Market Power in the Provision of Dedicated (Special Access) Services, attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, RM-10593 (filed Apr. 21, 2016) ("Baker 2d Supp. Reply Decl.").

intense."[2] Contrary to what IRW assert, however, potential competition from nearby rivals is not sufficient to constrain ILECs to price business data services competitively. Accordingly, the possibility of potential competition does not undermine the inference of ILEC market power derived from Prof. Rysman's observation that nationwide, 77.2% of buildings have a single in-building provider (almost always an ILEC) and almost all the rest (21.8%) have only two in-building providers.[3]

3.   IRW base their assertion that the presence of one nearby rival is sufficient to prevent ILECs from exercising market power on an incorrect supposition: that CLECs with facilities near but not in a building could invariably serve customers in that building now served by ILECs with little or no sunk expenditures (expenditures not recoverable in the event that entry is unsuccessful). The ILECs do not differentiate between CLECs that have nearby fiber transport facilities but no customer connections and

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[2] Mark Israel, Daniel Rubinfeld, & Glenn Woroch, Analysis of the Regressions and Other Data Relied Upon in the Business Data Services FNPRM and a Proposed Competitive Market Test, at 2, attached to Letter from Glenn Woroch, Department of Economics, University of California, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed Aug. 9, 2016) ("Third IRW Report"). IRW say that a nearby CLEC can be found in "virtually all areas" where there is demand for business data services. Third IRW Report at 3. Prof. Katz and Dr. Keating observe that markets may be highly competitive when most costs are sunk and the incremental cost of service is low, Reply Declaration of Michael L. Katz and Bryan G.M. Keating, ¶ 33 ("Katz & Keating Reply Decl."), attached as Exhibit A to Reply Comments of the National Cable & Telecommunications Association, WC Docket Nos. 16-143 & 05-25 (filed Aug. 9, 2016) ("NCTA FNPRM Reply Comments"), but they do not appear to follow IRW by asserting that CLECs with nearby facilities can serve most locations with little or no incremental sunk expenditures on last-mile facilities.

[3] Dr. Marc Rysman, Empirics of Business Data Services, at 15, tbl. 7 (rev. June 2016), https://apps.fcc.gov/edocs_public/attachmatch/DOC-340040A6.pdf (columns designated "UNE locations assumed ILEC"). These percentages are similar to those reported in Baker Decl. ¶ 44, derived using different building definitions.

CLECs with such facilities that also serve customers near the building.[4] In fact, CLECs with nearby facilities of either sort cannot practically serve many of the buildings now served by ILECs because of insufficient demand, costs to span the distance from the nearest fiber ring splice point, and difficulties or costs of obtaining building access and rights of way.[5] When these factors, which often preclude CLEC entry altogether, do not entirely rule out competition in a building by a CLEC with facilities nearby, substantial sunk investments nevertheless still are typically required to serve the building.[6] Furthermore, even if those sunk investments were not substantial, the CLEC may have high marginal costs of expanding output to multi-location customers,[7] limiting its post-entry incentive to compete

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[4] A CLEC with nearby facilities but without nearby building connections may not have a nearby fiber splice point. In that case, it is unlikely to constrain ILEC prices as much as would a CLEC with nearby facilities and nearby connections.

[5] *See* Baker FNPRM Reply Decl. ¶ 14 (citing Baker Decl. ¶¶ 96-109; Declaration of John Merriman on Behalf of Level 3 Communications, LLC, ¶¶ 4-6, attached as an Appendix to Comments of Birch Communications, Inc., EarthLink, Inc., and Level 3 Communications, LLC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed June 28, 2016) ("Merriman June Decl."); Declaration of David Schirack and Mike Baer, ¶¶ 16-18, appended as Attachment A to Comments of Windstream Services, LLC, WC Docket Nos. 16-143 & 05-25, RM-10593 (filed June 28, 2016) ("Schirack & Baer Decl."); Declaration of John Merriman on Behalf of Level 3 Communications, LLC, ¶¶ 5-6, 8-10, 16, attached as an Appendix to Reply Comments of Birch, EarthLink, and Level 3, WC Docket No. 05-25, RM-10593 (filed Feb. 19, 2016) ("Merriman Feb. Decl."); Third Declaration of Matthew J. Loch, ¶¶ 4-10, 12-13, appended as Attachment A to Reply Comments of TDS Metrocom, LLC, WC Docket No. 05-25, RM-10593 (filed Feb. 19, 2016)). When a CLEC adds service to a building that is near a building the CLEC already serves with fiber facilities, it generally extends its facilities from the fiber splice point, not from the location it already serves.

[6] *Id.* ¶ 14 & n.33.

[7] For example, a CLEC's marginal costs of expansion may be high if customers require service at multiple locations, and the CLEC must rely on connections leased from ILECs to provide service at a substantial fraction of those locations. *See* Merriman Feb. Decl. ¶ 17 ("[W]hen competing for the business of multi-location customers, the cost of leasing off-net facilities from the incumbent LEC to serve some of a potential customer's locations can be so high that Level 3 cannot effectively compete for the customer's business. Loss of such opportunities prevents Level 3 from building fiber to serve those potential customers, even when it might have been economic to deploy fiber to some, or even most, of customer's

with the ILEC in providing service to those customers and thereby limiting the extent to which its presence nearby constrains ILEC pricing.

4. These factors limit the competitive constraint imposed by nearby providers regardless of how close their existing facilities are to a building with demand for business services. Hence AT&T's observation that 90% of buildings with demand for business data services are within 1,107 feet of facilities from a CLEC,[8] if correct, does not imply that the ILECs are constrained to price competitively at most of their buildings.

5. Accordingly, these factors mean that an ILEC will generally not price competitively even if a CLEC deploys facilities to a nearby building that previously had been served only by an ILEC. Indeed, multiple empirical analyses of the business data services data reported in my previous declaration – which are robust and reliable, as I discuss further below – show that "rivalry from four or more in-building providers and four or more nearby providers has a cumulative effect in reducing ILEC prices that is more than ten times the effect of rivalry from one nearby provider alone."[9] Furthermore, the claim that an ILEC will price competitively when its only competition is potential rivalry from a single nearby provider is inconsistent with most common oligopoly models,

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locations. In this way, high incumbent LEC special access prices prevent Level 3 from building loops to buildings that otherwise meet Level 3's build guidelines.").

[8] Reply Comments of AT&T Inc., WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593, at 12 (filed Aug. 9, 2016) ("AT&T FNPRM Reply Comments").

[9] Baker FNPRM Reply Decl. ¶ 13 & n.31.

which find that two firms (or one firm and a potential entrant) are insufficient for the market to be competitive, and with the common finding of within-industry empirical studies that greater concentration leads to higher prices.[10]

6.   IRW also claim **[BEGIN HIGHLY CONFIDENTIAL]** ▮▮▮▮

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▮▮▮▮▮▮ **[END HIGHLY CONFIDENTIAL]** and contend that this means that CLEC entry is easy at low bandwidths.[11] Their factual assertion is incorrect: the data on which they rely reports nodes used to interconnect with third-party networks, not splice points to which last-mile facilities can be connected.[12] Even if many of these connections are close to splice points, moreover, their presence reflects entry conditions when they were deployed, which could have been decades ago, not entry conditions as of 2013 (the date at which the observations in the FCC's data were recorded) or today. Hence their presence does not support IRW's mistaken contention that it is routinely profitable for Level 3 to connect locations far from splice points today. U.S. Telecom's proposed competitive market test – which would deem a Census tract competitive whenever two or more providers have facilities within 2,000 feet of the

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[10] *See* Baker Decl. ¶ 48.

[11] Third IRW Report at 10, 34.

[12] *See* Letter from Thomas Jones, Counsel for Level 3 Communications, LLC, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593, at 3-4 (filed Sept. 9, 2016).

Census tract – should be rejected because it is based on that mistaken contention, along with the erroneous supposition that the presence of one nearby rival prevents ILECs from exercising market power.[13]

7.   The claim that potential competition from nearby rivals constrains ILEC prices is also inconsistent with the observation that ILECs routinely publish wholesale price lists on which prices vary by building, leading to price variation across buildings within a Census block.[14] This common practice cannot readily be reconciled with the claim that potential competition within a Census block prevents the ILEC from charging supracompetitive prices for business data services to all the buildings in that block.[15]

B.   The Empirical Results Do Not Indicate That Entry Is Easy

8.   Contrary to what Prof. Katz and Dr. Keating suggest, the empirical results showing that prices decline as the number of nearby rivals increases do not indicate that entry is easy.[16] If potential entry were

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[13] *See generally* Letter from Jonathan Banks and Diane Griffin Holland, U.S. Telecom, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143 & 05-25, RM-10593 (filed Sept. 9, 2016).

[14] *See* Letter from Thomas Jones, Counsel for EarthLink, Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593, at 3 (filed Jul. 21, 2016).

[15] The ILECs cannot reasonably assert that the price variation across buildings reflects variation in the competitive price resulting from variation in the costs of serving those buildings given the evidence that, conditional on CLEC entry, CLEC prices generally do not vary with costs. Baker FNPRM Reply Decl. ¶ 33. The ILECs also cannot reasonably assert that the variation in their wholesale prices reflects variation in customer willingness to pay because the prices vary by building not by customer.

[16] *See* Katz & Keating Reply Decl. ¶ 69 (discussing results for connections below 100 Mbps).

sufficient to make markets competitive, there would be no price reduction associated with an increase in the number of nearby rivals. Even where entry is generally unprofitable because of the factors discussed in Section II.A, it may occasionally be profitable in order to serve unusually attractive customers. Hence, neither the observation that prices fall as the number of nearby rivals grows nor the observation that entry sometimes occurs means that entry generally is easy at most locations.

C.   The Sunk Costs of Building Last-Mile Connections Discourage Entry

9.   Prof. Mayo suggests that CLEC entry is not impeded by the sunk costs of building last-mile connections because CLECs can contract with customers before building those connections.[17] But CLEC entry is unprofitable at many locations served by ILECs;[18] under such circumstances the CLEC could not enter even if it attempts to by contracting in advance because it could not cover its costs at the price that the ILEC charges.

10.   Even when entry potentially is viable, the CLEC typically bears a substantial risk after contracting with its customer, which limits the extent to which potential competition from a nearby provider constrains an

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[17] Reply Declaration of John W. Mayo, ¶¶ 34-35 ("Mayo Reply Decl."), attached as Exhibit B to Reply Comments of Comcast Corporation, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed Aug. 9, 2016) ("Comcast FNPRM Reply Comments").

[18] *See* Baker Decl. ¶¶ 96-106; Merriman June Decl. ¶¶ 4-6; Schirack & Baer Decl. ¶¶ 16-18; Merriman Feb. Decl. ¶¶ 13-17.

incumbent provider.[19] A CLEC's contracts with its customers are commonly no longer than three to five years, while new facilities may last for decades. To address the risk that the customer will switch to another provider of business data services (such as the ILEC) when the contract ends, or that the CLEC will have to discount its price substantially to keep the customer, CLECs commonly evaluate entry by requiring a short payback period (one roughly comparable to the term of initial customer contracts) or, to similar effect, by demanding a high internal rate of return.[20] A short payback period has the effect of limiting CLEC entry, when feasible, to locations where the CLEC can target customers likely to generate high revenues. Hence, the risks associated with the irreversibility of CLEC long-term investments in facilities (their sunk nature) discourage entry by CLECs that serve nearby locations, notwithstanding the possibility that CLECs would sign contracts in advance of deploying last-mile facilities.

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[19] High sunk costs, unrecoverable in the event of exit, discourage entry by raising its risk.

[20] Baker Decl. ¶ 104; Dr. Marius Schwartz & Dr. Federico Mini, Economic Basis for Not Regulating Competitive Providers of Business Data Services, at 15, attached as Appendix A to Comments of American Cable Association, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed June 28, 2016).

III. The Regression Results Confirm That the ILECs Commonly Exercise Market Power

A. The Regression Results Are Valid and Informative

11. This section addresses comments that question whether the regression results are valid and informative. As a group, these criticisms look at the trees without seeing the forest. The analyses of the FCC's data collectively indicate that the ILECs exercise market power in business data services, including at high bandwidths. Looking across the results presented in my declarations, as well as those presented by Prof. Rysman, it is evident that that ILEC prices tend to decline as rivalry from both in-building and nearby providers increases – indicating that the ILECs exercise market power. This inference is supported by the likelihood that the results of regressing ILEC prices on measures of rivalry are biased away from identifying an inverse relationship.[21] This inference is also consistent with the implications of market structure: in most locations, ILECs are the only provider of business data services, in most of the remaining locations they compete with only one CLEC rival, and rivalry from nearby providers and other potential entrants is insufficient to ensure competitive prices.[22]

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[21] *See* Baker Decl. ¶¶ 68-94. As I discuss in the next section of this declaration, it is unlikely that various possibilities suggested in comments would bias the results in the opposite direction, toward finding an inverse relationship.

[22] *See* Baker FNPRM Reply Decl. ¶ 11 (statistics on market structure).

12.   The empirical results, viewed collectively, identify an inverse relationship between ILEC prices and rivalry in business data services. In some cases, an inverse relationship is significant in an overall sample but not in some subsamples (such as subsamples based on differing regulatory regimes), or in results estimated using county fixed effects but not Census tract fixed effects. For example, in the high bandwidth regressions reported in my most recent declaration, measures of rivalry that are significant statistically in the overall sample (using clustered robust standard errors) when county fixed effects are employed are often not significant statistically when Census tract fixed effects are employed,[23] and measures of rivalry that are significant statistically (again using clustered robust standard errors) when estimated for connections subject to Phase II regulatory treatment are often not significant statistically when estimated for connections subject to price caps or Phase I regulation.[24] (But not always: when the relationship between price and measures of incremental rivalry is estimated for connections in Phase II regions, the cumulative effects of in-building rivalry and overall rivalry are significant statistically when Census tract fixed effects are employed as well as when county fixed effects are employed.[25])

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[23] *Id.* ¶¶ 39-40 & tbl. 1.

[24] *Id.* ¶ 46 & tbl. 3.

[25] *Id.* tbl. 3, cols. 7-8.

13.   As should be evident from the description of my results set forth in the preceding paragraph, AT&T is patently incorrect in asserting that the regressions I present for high-bandwidth connections do not use clustered standard errors, do not break out regulatory regimes, and find no significant relationships using Census tract fixed effects.[26]

14.   In general, when the estimated relationship is significant statistically in one regulatory treatment subsample but not another, or when one set of fixed effects are employed but not another, the estimated results that are not significant statistically do not preclude finding an inverse relationship. For example, the coefficients on measures of rivalry in the Census tract fixed effect regressions in the overall sample show an inverse relationship between price and rivalry of a plausible magnitude (although they are not significant statistically),[27] and the relationship between price and rivalry for connections in the Phase I subsample (which is not significant statistically) is generally consistent with the relationship in the Phase II subsample (which is significant statistically).[28] Moreover, when a sample is subdivided into more narrow subsamples, it is common for the precision of the estimates to be reduced (that is, for the regression results to become less informative). For this reason, if statistically

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[26] AT&T FNPRM Reply Comments at 51-52.

[27] Baker FNPRM Reply Decl. tbl. 1. In general, the estimated effects are smaller in magnitude than the corresponding effects in the county fixed effect regressions.

[28] *Id*. ¶ 46 n.88.

significant results from estimating a regression equation in an overall

sample lose significance when the regression equation is estimated in a

subsample, that does not mean that results in the overall sample should

not be credited. It also does not necessarily mean that the regression

estimates from the overall sample do not apply to the connections in the

subsample; as one example, it may be reasonable to conclude that they do

apply when the coefficients, while insignificant, are generally consistent

with the coefficients in the overall sample (or generally consistent with

coefficients in other subsamples, when the latter are significant

statistically). Hence, IRW, and Prof. Katz and Dr. Keating, are wrong to

assert that when the magnitude or statistical significance of coefficients on

variables accounting for rivals changes upon estimating the regressions on

different subsamples or using different fixed effects,[29] or when a variable

accounting for incremental rivalry occasionally has a positive sign in some

regressions,[30] then the regression results should necessarily be discarded.

For the same reasons, IRW are wrong to assert that the FCC should not

address the exercise of market power for connections in a specific

subsample of the overall sample unless it can point to a statistically

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[29] *See, e.g.*, Third IRW Report at 19-20, 23, 25-26, 28; Katz & Keating Reply Decl. ¶¶ 36, 41, 43, 56-57; *see also, e.g.*, Third IRW Report at 13 (discussing and approving similar conclusions in Declaration of John W. Mayo, ¶¶ 71-78, attached as Exhibit B to Comments of Comcast Corporation, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed June 28, 2016) ("Mayo Decl.")).

[30] Katz & Keating Reply Decl. ¶ 41 (quoting Supplemental Declaration of Mark Israel, Daniel Rubinfeld, & Glenn Woroch, ¶ 5, attached to Letter from Christopher T. Shenk, Counsel for AT&T, and Russell P. Hanser, Counsel for CenturyLink, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, RM-10593 (filed Mar. 24, 2016)).

significant inverse relationship in a regression for that particular subsample.[31]

15.   In the regression results presented in my August 9, 2016 declaration and discussed here, statistical significance is evaluated using robust standard errors that are clustered by Census block.[32] Clustering standard errors accounts for the possibility that ILEC prices are affected by unobservable cost or demand factors that are similar across the locations within a Census block but may vary across Census blocks.[33] In a letter to the Commission, one of the peer reviewers of Prof. Rysman's report, suggested the possibility of clustering standard errors by Census tract rather than Census block.[34] Doing so for the regressions I reported in Table 1 of my August 9, 2016 declaration generally increased standard errors slightly, and did not change the results of any reported significance tests.[35] Similarly, the Commission staff recently reported the results of

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[31] Mark Israel, Daniel Rubinfeld, & Glenn Woroch, Analysis of the Revised Regressions Disclosed By FCC Staff on August 22, 2016, at 11-12, attached to Letter from Christopher T. Shenk, Counsel for AT&T, and Russell P. Hanser, Counsel for CenturyLink, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143 & 05-25, RM-10593 (filed Sept. 8, 2016) ("Fourth IRW Report") (discussing, for example, the policy implications of regression results for a sample limited to DS1 services in Phase I areas).

[32] *See* Baker FNPRM Reply Decl. tbls 1-3.

[33] That possibility is an assumption not a "fact," contrary to what IRW assert. Fourth IRW Report at 5. If ILEC prices do not vary systematically for this reason, the error correlations accounted for by clustering may be spurious and tests of statistical significance based on the robust standard errors that Prof. Rysman and I had previously reported would also be appropriate.

[34] Letter from Andrew Sweeting, Associate Professor, University of Maryland, to Matthew DelNero, Chief, Wireline Competition Bureau, FCC, at 1 (Jul. 13, 2016), https://apps.fcc.gov/edocs_public/attachmatch/DOC-340457A4.pdf.

[35] Baker FNPRM Reply Decl. ¶ 38 n.81.

clustering standard errors by Census tract (in regressions with Census tract fixed effects) or county (in regressions with county fixed effects) for regressions based on Prof. Rysman's specifications, properly characterized the consequences of doing so as "minor" for the regressions of primary interest,[36] and reasonably concluded that "overall the regressions show competition lowers ILEC prices by an amount that is statistically distinguishable from no effect."[37] For these reasons, IRW, and Prof. Katz and Dr. Keating, are wrong to assert that the regression results should not be credited because some coefficients lose statistical significance when standard errors are clustered.[38]

16.   Even if these results were interpreted with blinders as to the market structure evidence and the likely direction of bias in the empirical analysis, the appropriate conclusion would be that the results are consistent with the inverse relationship identified in the overall sample or county fixed effects regression, and thus with identifying ILEC market power, not (as some comments suggest) that the results somehow disprove ILEC market power.[39] That conclusion is strengthened by the likelihood that the results

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[36] Federal Communications Commission Staff, *Update on the Use of Cluster-Robust Standard Errors in Business Data Services Regressions*, at 2 (Aug. 22, 2016), http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0822/DOC-340891A1.pdf.

[37] *Id.* at 3.

[38] *See* Third IRW Report at 8-9, 15, 23, 27-28; Katz & Keating Reply Decl. ¶¶ 41-44.

[39] *See, e.g.*, AT&T FNPRM Reply Comments at 52 (discussing the implications of using county fixed effects versus Census tract fixed effects).

are biased away from identifying an inverse relationship, discussed below in Section III.C, and the likelihood that ILECs exercise market power when (as is typical) they are the sole provider at a location or one of a small number of providers. Moreover, that probable bias means that the inference of an inverse relationship between price and rivalry is not called into question if a variable accounting for incremental rivalry occasionally has a positive sign in some regressions.

17. For these reasons, the empirical results establish the most important feature of the forest: that the ILECs exercise market power in the provision of business data services. The empirical results also establish another key feature of the forest: that ILEC prices decline substantially with rivalry. For example, the cumulative effect of rivalry from four in-building and four nearby providers reduces ILEC prices for high-bandwidth connections (those above 50 Mbps capacity) "by 43% according to one estimate and by 25% according to another, and reduces ILEC prices for DS1 connections by 51% according to one estimate and 42% according to another."[40] Given the likely direction of bias in the results, these estimated cumulative effects should be thought of as lower bounds.

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[40] Baker FNPRM Reply Decl. ¶ 5. These estimates come from regression specifications based on those adopted by Prof. Rysman in his table 19, which were refined by modifying the way rivalry is accounted for and the way nearby rivals are identified, and by adding controls to account for differences in the relationship between price and competition across providers and bandwidths. *See* Baker FNPRM Decl. ¶¶ 8-9, 11 n.17.

18.   The remainder of this section addresses other arguments raised in comments about why the regression results are not informative and should not be credited aside from bias issues, which are discussed below in Section III.C.

Measures of Rivalry

19.   In the regression analyses based on the FCC's business data services data, estimates of cumulative effects are in general more reliable than estimates of individual incremental effects with respect to precision and robustness,[41] as those estimates tend to be more consistent in statistical significance across specifications. For this reason, the regression results that indicate substantial and statistically significant cumulative effects of rivalry show ILEC market power and a substantial elevation in ILEC prices over competitive levels, notwithstanding IRW's observation that the magnitude of the coefficients on measures of incremental rivalry from the second, third, and fourth CLEC may vary within or across those regressions.[42]

20.   Prof. Farrell argues that the regression results presented by Prof. Rysman are unreliable because Prof. Rysman did not separate out in-

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[41] *Cf.* Reply Declaration of Joseph Farrell, ¶ 115, attached as Exhibit A to Comcast FNPRM Reply Comments ("Farrell Reply Decl.") (asserting that the incremental effects of multiple competitors are likely poorly identified).

[42] Third IRW Report at 20.

building and nearby rivalry or account for UNE-based rivalry.[43] This criticism ignores the results that I have presented, which show a strong inverse relationship between prices and rivalry when in-building and nearby rivalry are accounted for separately,[44] and that prices decline with in-building and nearby rivalry when UNE-based rivalry (which also lowers prices) is accounted for.[45]

Errors in Measuring ILEC Prices

21.   IRW criticize Prof. Rysman's (and presumably also my) empirical results on the ground that the dependent variable may be measured with error;[46] and Prof. Farrell does so on the related ground that the independent variables leave some variation unexplained.[47] But regression estimates are not made unreliable simply because the dependent variable is measured with error and the independent variables leave some variation unexplained; there is always a regression error and the independent variables never completely explain variation in the dependent variable. These features of the data analysis affect the precision with which the

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[43] Farrell Reply Decl. ¶ 125.

[44] *See, e.g.*, Baker FNPRM Reply Decl. tbls. 1-3.

[45] Baker Decl. ¶ 67.

[46] Third IRW Report at 12-14 (discussing errors in measuring prices); *see also* Katz & Keating Reply Decl. ¶ 51 (contending that the regression analyses do not account for aspects of heterogeneity in costs and services across customers, which affect prices).

[47] Farrell Reply Decl. ¶¶ 79, 104.

relationship is estimated, but they are not reasons to reject the results as unreliable when an estimated relationship is significant statistically.

Missing Price Data

22.   IRW argue that missing price data makes the regression results unreliable.[48] The regression results could be biased if the distribution of missing prices is correlated with the price level and the regression results are interpreted as describing the relationship between the number of rivals and price for all business data services.[49] Even if the missing prices are not distributed uniformly across regions or providers, however, that distribution is not necessarily correlated with the price level, and even if it is, the resulting sample selection bias could go in either direction.

23.   As described in an earlier declaration, the distribution of missing price data did not bias the regression results presented in my initial declaration: those results were "not sensitive to the inclusion of states or providers with a relatively high proportion of missing prices."[50] Moreover, IRW have made no effort to show, empirically or otherwise, the magnitude or direction of the sample selection bias. Accordingly, there is no basis for concern that sample selection bias from missing prices would lead the

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[48] Third IRW Report at 13-14.

[49] The estimated coefficients would not be biased if interpreted as describing the relationship only for the locations where prices are available.

[50] Baker Supp. Reply Decl. ¶ 16.

regression analyses to overstate the inverse relationship between the number of rivals and price, or that the conclusions derived from those regressions would change if the missing data were available.

Regulatory Treatment Regions

24.   IRW question the validity of Commission staff results (and presumably my results to similar effect) showing an inverse relationship between price and rivalry for DS1 and DS3 connections in price cap areas, because they presume that ILEC prices must be nearly identical across customers within price cap zones.[51] Their presumption is incorrect. In the FCC's data, a substantial fraction of ILEC DS1 connections (38%) and ILEC DS3 connections (42%) in price cap areas were sold through term discount plans.[52] These plans allow ILEC prices to vary substantially across customers within price cap zones, making it possible to identify in the data an inverse relationship between prices and rivalry for connections in those regions.

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[51] Third IRW Report at 20.

[52] Even where price caps apply, moreover, an ILEC may have the ability to lower prices in response to potential or actual CLEC entry by reengineering circuits to reduce channel mileage charges.

B.   The Regression Analyses Show That ILECs Exercise Market Power at All
Bandwidths and with All Types of Connections

25.   AT&T asserts that the regression analyses performed by Prof.

Rysman and the Commission staff show no evidence of market power for

high-bandwidth connections (*i.e.*, connections above 50 Mbps), and

evidence of only minimal market power for lower-bandwidth

connections.[53] Their assertions ignore the results presented in my August

9, 2016 declaration, which are also part of the record in this proceeding,

and which show substantial ILEC market power for both high-bandwidth

and low-bandwidth connections.[54]

26.   AT&T also asserts that the regression analyses performed by Prof.

Rysman and the Commission staff show no evidence of market power for

Ethernet connections.[55] That assertion ignores the evidence of market

power for high-bandwidth connections, noted in the previous paragraph,

most of which are Ethernet connections.

C.   The Regression Results Are Biased Away from Identifying an Inverse
Relationship Between Price and Rivalry

27.   It is likely that regressions estimated on the business data services

data are biased away from identifying an inverse relationship between

price and rivalry for a number of reasons: unobservable customer

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[53] AT&T FNPRM Reply Comments at 13.

[54] *See* Baker FNPRM Reply Decl. ¶¶ 5-10.

[55] AT&T FNPRM Reply Comments at 13.

heterogeneity, unobservable impediments to CLEC expansion, errors in
measuring the price of business data services, multi-year ILEC contracts,
unobservable wholesale switching costs, and ILEC wholesale pricing
policies.[56] The comments submitted in this proceeding do not question
that the regression results could be biased toward masking or muting an
inverse relationship, as I claim. Instead, some comments propose
additional reasons why the bias could go the other direction, toward
amplifying inverse relationship. This section explains why these proposed
additional sources of bias may actually tend to mask an inverse
relationship or are unlikely to be important empirically.

Endogeneity Bias

28.   Several commenters note the possibility that the variables
measuring rivalry could be endogenous in regressions that seek to
estimate how prices change in response to changes in rivalry.[57] Their
primary concern is with the possibility that low prices would be correlated
with CLEC rivalry if CLECs enter in response to low costs and those costs
are not controlled for by other variables in the regression.

29.   The possible endogeneity of CLEC entry is unlikely to bias the
regression results relating price and rivalry in the business data services

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[56] *See* Baker Decl. ¶¶ 68-94.

[57] Farrell Reply Decl. ¶¶ 88, 111, 132-37; Mayo Reply Decl. ¶ 36; Third IRW Report at 8, 15-19; Katz &
Keating Reply Decl. ¶¶ 37-40.

data toward wrongly indicating an inverse relationship for two reasons.[58]

First, fixed effects and other independent variables control for most costs,

and costs that are not controlled for are unlikely to affect prices. The only

important costs likely not to be controlled for in the regressions are those

resulting from variation in building access fees and costs of obtaining

rights of way within a county or Census tract. Variation in these costs

within a county or Census tract is unlikely to affect the number of CLECs

that serve a building (conditional on such costs not being so high as to

make entry unprofitable for all CLECs) or the number of nearby providers.

Local variation in these costs is also is unlikely to affect CLEC prices

(conditional on CLEC entry), and thus is unlikely to affect ILEC prices (the

dependent variable in most regressions).[59]

30.　　Second, to the extent entry is endogenous, it is because CLECs enter

(by building their own last-mile facilities) in response to high demand (or

high customer willingness to pay for business data services), which is not

controlled for by other variables in the regression.[60] If that is the case, the

bias from entry endogeneity would tend to mask or understate an inverse

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[58] *See generally* Baker FNPRM Reply Decl. ¶¶ 28-36; Baker Supp. Reply Decl. ¶¶ 19-21; Baker 2d Supp. Reply Decl. ¶¶ 10-17.

[59] Baker FNPRM Reply Decl. ¶¶ 32-34. These costs may affect CLEC entry decisions, but they rarely if ever affect CLEC prices conditional on entry.

[60] *See id.* ¶¶ 28-36.

relationship between rivalry and price – which is the opposite direction from the theoretical possibility supposed in the comments.[61]

31.   Relatedly, IRW suggest that the regressions do not control for cost variation resulting from the possibility that businesses are not distributed uniformly within Census tracts, particularly because businesses that anticipate purchasing substantial business data services bandwidth may choose to locate near other business doing so in order to minimize the length of last-mile facilities.[62] This suggestion does not raise a potential problem of endogeneity arising from uncontrolled-for CLEC costs. The relevant question for assessing the potential for endogeneity bias is not whether some customers are located in clumps, which is the question IRW analyze. Rather, it is whether the distance from fiber splice points to those businesses served by CLECs is distributed non-uniformly and whether any resulting variation in costs is substantial. There is no reason to suppose that the latter is the case systematically, and IRW do not suggest this.

Selection Bias

32.   The empirical relationship between prices and rivalry may be biased by a selection effect identified by Prof. Farrell; but in cross-sectional data (as with the FCC's business data services data) the bias

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[61] Prof. Katz and Dr. Keating ignore both of these points when they assume that in the data, entry and prices must be driven by cost conditions. Katz & Keating Reply Decl. ¶ 40.

[62] Third IRW Report at 17-19 (discussing the possibility of demand agglomeration to take advantage of provider economies of density).

plausibly goes against identifying an inverse relationship, which is opposite from the direction suggested by Prof. Farrell.[63]

33.   The selection effect is predicated on a CLEC entrant's incentive to target those ILEC customers that previously paid the most for business data services. If the CLEC does so, the regression results could be biased toward identifying an inverse relationship between price and rivalry in time series data (which does not describe the FCC's business services data).[64]

34.   The selection effect cannot matter empirically unless the CLEC can identify customers willing to pay a relatively high amount for business data services and the econometrician cannot. The customer characteristics on which selection is based must be observable to the firms but not be observable in the data.

35.   If the CLEC can reliably identify customers with a high willingness to pay, it would be expected to use that information to identify the most attractive regions (such as Census blocks) to serve,[65] and to identify the most attractive potential customers in those regions to target when marketing its business data services. In cross-sectional data, as will be

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[63] Farrell Reply Decl. ¶¶ 143, 148.

[64] In time series data, the ILEC's average price in a given region could fall after the number of rivals increases even if the ILEC does not lower its price to any customer in response to CLEC entry, if the CLEC tends to take away those customers that previously paid the ILEC the most.

[65] The regression analyses in this proceeding generally include fixed effects for Census tracts or counties, and the presence of rivals is generally identified based on provider presence in a Census block. Hence these regions may be thought of as different Census blocks within a Census tract or county.

explained, selection across regions would tend to bias the regression results toward masking an inverse relationship (the opposite of the direction that the bias would likely take in time series data). That is, as the next four paragraphs will explain, if unobservable CLEC selection in identifying where the CLEC enters is important empirically, as Prof. Farrell hypothesizes, greater CLEC rivalry in an area will plausibly be associated in the data with high ILEC prices in that area, and less CLEC rivalry will plausibly be associated in the data with low ILEC prices.

36. If selection is important, a CLEC with limited resources would tend to enter those regions which have a greater than average concentration of potential customers with a high willingness to pay for dedicated services. Those are the regions where an ILEC monopolist able to discriminate in price by customer type (as the selection effect story assumes) would be expected to receive a relatively high average price. The CLEC would take away some of the ILEC's most valuable customers in such a region if it can identify them (as the selection effect story supposes), but not all.[66]

37. It is consistent with Prof. Farrell's hypothesis that the selection effect is important empirically to suppose that the ILEC's average price in

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[66] Some of the ILEC's customers may be tied to the ILEC, at least for a while, by long term contracts or other switching costs, and the ILEC would be expected to keep others by reducing price. All of the economists commenting on the regression analyses in this proceeding accept that the ILEC would lower price in response to competition from CLECs to some extent. (Some of the comments argue for an extremely competitive response: they contend that so long as the ILEC faces one nearby CLEC rival, the ILEC will lower its price to the competitive level. Based on both economic theory and empirical evidence, the latter assumption, and its implication that business data services prices are competitive so long as an ILEC has at least one nearby or in-building rival, should not be credited. *Supra* Section II.A.)

the region would remain relatively high, although, with CLEC entry, the ILEC's average price would be lower than before.[67] If the selection effect is as important as Prof. Farrell's conjecture supposes, the main determinant of ILEC prices in a region will be its concentration of customers willing to pay high prices. In a region where such customers are concentrated, CLEC entry will lower prices to some extent, but it is reasonable to suppose that the ILEC's prices would typically remain above what the ILEC charges in a region where few customers are willing to pay high prices, even if CLECs do not enter the latter region. Hence CLEC selection of regions to enter means that in the data, greater CLEC rivalry would tend to be associated with relatively high ILEC prices.

38.   At the same time, Prof. Farrell's hypothesis that the selection effect is important empirically implies that the CLEC would tend to avoid entering regions which have a lower than average concentration of potential customers with high willingness to pay for dedicated services. In those regions, it is consistent with Prof. Farrell's hypothesis to suppose that the ILEC's average price would be relatively low, even absent CLEC

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[67] If prices fall close to competitive levels with CLEC entry, then a CLEC's margins would be low regardless of its choice of region to enter, so the selection effect would be unimportant empirically. Taken at face value, moreover, the empirical evidence indicates that when the ILEC responds to incremental CLEC competition by lowering its price, it does not lower price to the competitive level. In my regression results, prices decline as rivalry increases even with four in-building and four nearby providers, and the price reduction from an incremental increase in rivalry is substantially less than the cumulative price reduction. Hence, the ILEC would be expected to keep many high-value customers following CLEC entry and continue to charge them a relatively high price.

entry. In the data, therefore, less CLEC rivalry would be associated with relatively low ILEC prices.

39. In sum, if unobservable CLEC selection in identifying where the CLEC enters is important empirically, greater CLEC rivalry in an area will plausibly be associated with high ILEC prices in that area, and less CLEC rivalry will plausibly be associated with low ILEC prices.[68] This association – which is not inconsistent with the observation that ILEC prices tend to fall when CLECs enter either area – will tend to bias the results of regressing price on rivalry away from identifying an inverse relationship in cross-sectional data, contrary to what Prof. Farrell suggests.[69] Accordingly, when the underlying relationship between price and the number of competitors is inverse (lower price with more rivals) and when the selection effect is important empirically, an econometrician unable to control fully for the customer heterogeneity from which this selection problem derives would plausibly observe a weaker relationship, no relationship, or a direct relationship (higher price with more rivals) in the business data services data.[70]

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[68] The rivalry at issue could involve in-building providers or nearby providers. If the CLEC deploys a last-mile connection to serve a different customer in the same building, it would be an in-building rival. If the CLEC deploys a last-mile connection to serve a customer in a different building, it would be a nearby rival.

[69] The extent of the bias will depend on various factors including the difference between the price an ILEC monopolist charges high-value customers and the price it charges low-value customers, the difference in concentration of high-value customers across regions, the extent to which the ILEC lowers price in response to CLEC entry, and the fraction of the ILEC's high-value customers that switch to the CLEC.

[70] For the reasons indicated above, it is plausible that the selection bias would work against identifying an inverse relationship. If most customers have low switching costs and if the ILECs do not compete to keep their best customers, it is possible that CLEC selection could bias the cross-sectional results in the

Bias from Multi-Year Contracts (Use of Pre-2013 Pricing Data)

40.   When ILECs have multi-year contracts with their customers, ILEC prices recorded in the data (which is for a single year) will not reflect the competitive effect of additional rivals that emerge during the contract term. That influence would only become apparent in the data when the contract is renewed. Accordingly, as I explained in my original declaration, the regression results will understate the downward price effect of new CLEC entrants, biasing the results away from identifying an inverse relationship between ILEC prices and rivalry.[71]

41.   IRW uncritically accept Prof. Mayo's flawed assertion that the likely bias would go the other way, framing the point in terms of reliance on pre-2013 pricing data.[72] Prof. Mayo assumed that entry tends to occur in locations where contract prices were high. If so, and if the contract term has not ended, the number of rivals observed in the data for those locations would exceed the number of rivals that were competing at the time the ILEC set its prices (which would predate 2013). Contrary to what Prof. Mayo asserted, this will tend to make it appear as though greater rivalry does not compete down ILEC prices; the effect of increased rivalry in lowering ILEC prices would not be apparent until the contract term

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opposite direction, toward amplifying an inverse relationship between price and rivalry rather than toward masking it, but that possibility is less plausible.

[71] Baker Decl. ¶¶ 90-92.

[72] Third IRW Report at 12-13 (citing Mayo Decl. ¶ 71).

ends and so would not be observed in the data. If instead the contract term has ended, the observation will not create a bias, as the ILEC's prices will properly account for the rivalry it experiences.

42. Prof. Mayo sought to correct for bias by limiting the sample to observations with prices set in 2013, the year that the rivalry variables are measured.[73] As I explained in more detail in a prior declaration, the markedly smaller sample size makes it more difficult to identify the relationship between prices and rivalry, so it is not surprising – and not an appropriate basis for criticizing Prof. Rysman's or my regression results – that Prof. Mayo does not always find a significant inverse relationship when re-estimating Prof. Rysman's models on the limited sample he selects.[74]

Bias from Multi-Location Contracts

43. IRW observe that ILEC prices for some connections are set in contracts that cover multiple locations.[75] As a result, the ILEC may set the same price at each location.

44. The use of multi-location contracts is unlikely to bias the regression results toward amplifying an inverse relationship between price and rivalry. Rather, this possibility would be expected to bias the regression

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[73] Mayo Decl. ¶ 72.

[74] Baker FNPRM Reply Decl. ¶ 27.

[75] Third IRW Report at 13.

results away from identifying an inverse relationship between price and rivalry in cross-sectional data (as with the FCC's business data services data) because it limits the extent to which the ILEC would vary its price at an individual location with rivalry at that specific location.[76] Moreover, including an indicator variable to account for multi-location customers made little difference to the estimated coefficients on variables accounting for rivalry in the high-bandwidth regressions I previously presented.[77]

Bias from Differences in CLEC Effectiveness Across Locations

45.   Prof. Farrell agrees with my prior observation that if some CLECs are weak competitors, with high marginal costs of output expansion, while other CLECs entrants are effective competitors able to increase output inexpensively, the estimated relationship between price and rivalry will understate the extent to which effective CLEC rivalry would reduce ILEC prices.[78] Prof. Farrell also correctly observes that under these circumstances, the estimated relationship will overstate the effect of weak CLEC rivals on ILEC prices. But that observation does not affect my conclusion about the significance of the possibility that some CLEC rivals are weak for the interpretation of the regression results. The purpose of the analysis is to determine whether ILEC prices decline in response to

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[76] Baker Decl. ¶ 94.

[77] Baker FNPRM Reply Decl. ¶ 45.

[78] Farrell Reply Decl. ¶ 149.

additional rivalry by effective competitors, as only that relationship provides empirical evidence about the extent to which ILECs exercise market power; the analysis is not aimed at estimating the effect of ineffective CLEC rivals on ILEC prices. The presence of weak CLEC rivals will lead the data to understate the magnitude of the inverse relationship between price and rivalry from effective competitors.

46.   Prof. Farrell also argues that the relationship between ILEC prices and rivalry might not be estimated correctly if, hypothetically, the data include two types of locations: some locations where potential CLEC entry constrains ILEC monopolists to price at the competitive level (so there would be no relationship between price and rivalry) and other locations where potential CLEC entry does not do so (so there would be an inverse relationship).[79] Contrary to what Prof. Farrell supposes, however, there are unlikely to be any locations where potential entry constrains ILEC monopolists to price at the competitive level;[80] I will assume here that this is possible in some locations solely for purpose of argument.

47.   Prof. Farrell's argument assumes that CLEC entry and expansion are difficult in areas where potential entry does not constrain ILEC monopolists to price competitively. If so, those CLECS that do enter will

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[79] *Id.* ¶ 149 n.159. At the first type of location, Prof. Farrell supposes that the prospect of entry constrains the ILEC to price competitively, and that if CLEC entry did occur, the entrant would price identically to the ILEC. At the second type of location, Prof. Farrell supposes that entry is generally difficult, but that if entry happens to succeed, it will lead the ILEC to lower its price.

[80] *See generally supra* Section II.A.

provide little competitive constraint, so the inverse relationship between price and rivalry would be weak if it can be observed at all.

48.   If, as Prof. Farrell appears to assume, there is no relationship between price and rivalry in the first type of location and a very weak relationship in the second type of location, then a data analysis that pools the locations for estimation (with no control variables that distinguish the two location types) would correctly reveal little or no overall relationship between price and rivalry; the data analysis would not be biased. If instead there is no relationship between price and rivalry in the first type of location and a strong relationship in the second type of location, as Prof. Farrell may be supposing in the alternative, then a data analysis that pools the locations would not mislead: it would provide an unbiased estimate of the average relationship, which is less inverse than the true relationship at locations in which it is inverse and more inverse than the true relationship at locations in which there is no relationship.

IV.   ILEC Prices Are Substantially in Excess of Competitive Prices

A.   <u>The Cumulative Effects of Rivalry Are Not Implausibly Large</u>

49.   Prof. Farrell suggests that the estimated percentage declines in ILEC prices from competition – such as the cumulative effect estimates reported above, which range from 25% to 51% – are implausibly large, given that they are larger than the percentage price increases often suggested in analyses of the unilateral competitive effects of horizontal

mergers.[81] But monopolists and cartels often elevate price by substantially

greater percentage amounts than merging sellers of differentiated

products generating adverse unilateral competitive effects.

50.   A better comparison is to the price elevation from monopolization

and cartels (which, if complete, involve firms acting collectively like a

monopolist). One review of cartel overcharges identified in economic

studies and by courts found average overcharges of 31% to 49%, and

median overcharges of 22% to 25%.[82] If industry demand is relatively

inelastic in a substantial range, moreover, it is likely that the monopoly

price would be substantially above the competitive price. For these

reasons, the estimated percentage declines in ILEC prices from

competition are not implausibly large.

B.   ILECs Do Not Systematically Set Prices Below the Competitive Level

51.   Prof. Katz and Dr. Keating raise the possibility that ILECs

systematically set prices below the competitive level when they compete

with multiple CLECs offering service through each CLEC's own facilities at

the same locations or nearby.[83] This suggestion does not provide a reason

to question the empirical results indicating that ILEC prices decline

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[81] Farrell Reply Decl. ¶¶ 63-68.

[82] John M. Connor & Robert H. Lande, *How High Do Cartels Raise Prices? Implications for Optimal Cartel Fines*, 80 TULANE L. REV. 513, 513 (2005). Cartel overcharges would be expected to be less than monopoly overcharges in the same industries because cartels are often incomplete.

[83] Katz & Keating Reply Decl. ¶¶ 47-48.

substantially as rivalry increases or the inference that the ILECs exercise market power.[84] Instead, Prof. Katz and Dr. Keating are raising the theoretical possibility that the competitive price is above the average price the ILECs charge when they compete with multiple in-building and nearby rivals.

52.   The theoretical possibility identified by Prof. Katz and Dr. Keating is unlikely to apply to business data services markets. Their comment offers no evidence to suggest that ILECs systematically reduce price below the average cost of facilities-based CLECs (a reasonable interpretation of the competitive price) when ILECs compete with multiple in-building and nearby rivals. Nor is that suggestion plausible.[85] If, under such circumstances, the ILEC were systematically setting prices below the average costs of facilities-based CLECs when the ILEC competes with multiple CLECs,[86] that would imply that those CLECs are also

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[84] In a market with free entry, it is theoretically possible for firms to exercise market power, as through price discrimination, without earning supracompetitive profits, and thus without harming competition overall. That theoretical possibility is not relevant here because it is inconsistent with the abundant evidence that entry into business data services markets is not free, but requires substantial sunk expenditures and time.

[85] This discussion is concerned with the relationship between ILEC prices and the average costs of CLECs that provide last-mile connections through their own facilities. If the CLEC provides service through a wholesale connection leased from an ILEC, the ILEC has an incentive to exclude the CLEC by charging a high price for that connection. *See generally* Declaration of Robert D. Willig, appended as Attachment B to Reply Comments of Windstream Services, LLC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed Aug. 9, 2016) ("Willig Decl."); *see also* Baker Reply Decl. ¶¶ 14-16 (discussing the incentive and ability of a vertically-integrated ILEC to exclude CLEC rivals and harm competition by setting a high wholesale price relative to its retail price (*i.e.*, by creating a "price squeeze")); Baker Decl. ¶ 38 (describing evidence that ILECs charge high prices for wholesale connections relative to the retail price they charge for similar connections).

[86] The CLEC's average cost presumably exceeds its marginal cost. I do not understand Prof. Katz and Dr. Keating to suppose that the CLEC sets any price below its marginal cost.

systematically setting quality-adjusted prices below their average costs when competing for customers served by multiple rivals.[87] But it is highly unlikely that CLECs – which have limited investment capital and do not make investments unless the expected returns exceed high hurdle rates (short payback periods) – systematically accept low margins when adding last-mile connections to buildings that are also served by the ILEC and other CLECs.[88] It is even less likely that nearby CLECs would systematically and credibly threaten to build last-mile connections at a price below the CLEC's average cost, leading an ILEC to charge a price below the CLEC's average cost in order to keep the business. Yet it would be necessary for the CLECs to behave in these implausible ways in order for the comment's theoretical conjecture to hold.

53.   The supposition that ILECs systematically set prices below the competitive level when they compete with multiple CLECs cannot be rescued by the supposition that ILECs average business data services prices across regions. Frontier and CenturyLink assert that their prices for DS1 and DS3 services are averaged across urban and rural regions, which have different costs, and that in consequence, prices are systematically

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[87] This discussion assumes that a competing CLEC matches the ILEC's quality-adjusted price, accounting for service quality and features. If CLECs compete with each other or an ILEC by offering better customer service or other service features, a CLEC's average cost would include the cost of providing those features.

[88] CLECs may occasionally serve an additional customer within a building where they already have facilities at a low price-cost margin, but such opportunistic conduct is not systematic, as it would need to be in order to raise the possibility that the average ILEC price when competing with multiple CLECs could be lower than the competitive price.

below "cost" in high cost regions (which are presumably rural).[89] Even if

this assertion is correct, Frontier and CenturyLink are simply assuming

that their "cost" can be equated to the competitive price.[90] In addition, the

price averaging that Frontier and CenturyLink claim appears to be

concerned with differences in prices across locations *between* rural and

urban counties or Census tracts, not differences in prices across locations

within counties or Census tracts, which are more homogeneous. In

regressions with county or Census tract fixed effects, therefore, price

averaging across regions would be unlikely to lead ILECs systematically to

set prices below a competitive level in locations where they compete with

multiple CLECs. (To the extent price averaging matters empirically,

moreover, it would be expected to bias the empirical results in the

direction of masking an inverse relationship between price and rivalry,

because price averaging limits the extent to which an ILEC would vary its

price at an individual location with rivalry at that specific location.)

54.   For these reasons, the competitive price is likely no greater than the

prices ILECs charge when competing with multiple CLECs. Hence the

regression estimates showing that an ILEC monopolist charges

substantially in excess of what the ILEC charges when it competes with

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[89] *See* Business Data Services: Proposals vs Market Realities, at 8, appended as Attachment A to Letter from Mike Saperstein, Vice President, Federal Regulatory Affairs, Frontier Communications, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed Aug. 29, 2016).

[90] Perhaps Frontier and CenturyLink are supposing that potential competition prevents them from exercising market power. That assertion cannot be maintained, for the reasons set forth in Section II of this declaration.

multiple CLECs are reasonably interpreted as indicating that in competitive markets, the ILECs would charge substantially less than they do today.

C.   Ethernet Price Declines Do Not Imply That ILECs Price Competitively

55.   AT&T observes that some Ethernet prices have declined (without clarifying whether they are referring to retail as well as wholesale prices) and that Ethernet usage has expanded nationwide over the past three years, and leaps to the unsupported conclusion that Ethernet markets are competitive.[91] Assuming that AT&T is correct as to the stylized facts about the Ethernet business, AT&T's inference has a number of logical gaps. First, the combination of lower prices and greater output do suggest that supply increased, but AT&T assumes that the supply increase arose from increased competition without ruling out obvious alternative possibilities: that supply has increased because costs of providing any given bandwidth have fallen and that firms are investing in anticipation of future growth in demand. The possibility of substantial cost reductions is suggested by the evidence that the costs of building a fiber network, including the costs of deployment to business service customer locations, have been declining at a rate of 7% to 10% annually since 2002.[92]

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[91] AT&T FNPRM Reply Comments at 17-21, 23.

[92] CostQuest, Network Cost Differentials Over Time, at 2, fig. 1, appended as Attachment B to Letter from Jennie Chandra, Windstream Corporation, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 13-5 & 12-353, WC Docket Nos. 05-25 & 15-1, RM-10593 (filed June 8, 2015). The cost trend data reported in this study does not cover the past three years, but there is no reason to think the trend has changed. *Cf.*

56.   Second, if greater competition is an important explanation for the stylized facts about the Ethernet business, it means that Ethernet markets were not competitive in 2013, and thus that AT&T is incorrect when it asserts elsewhere that the FCC's business data services data (which are for 2013) demonstrate that Ethernet services (*e.g.*, at high bandwidths) were provided competitively. Third, even if markets have been becoming *more* competitive, that need not be inconsistent with the continued exercise of market power, or imply that the ILECs are now constrained to set competitive prices at any location or at any bandwidth. To the extent that recent growth in Ethernet-based business data services derives from investments by cable providers in their networks,[93] that growth suggests the possibility that some ILEC monopoly locations have become duopoly locations. The addition of an in-building rival would be expected to lead the ILEC to lower its prices on average to customers in buildings where a cable provider now offers business data services, but not to induce prices to decline to competitive levels at those locations.

57.   Fourth, AT&T's assertions as to the magnitude of a decline in the prices of the Ethernet connections it purchases out of its ILEC footprint, if

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Letter from Russell P. Hanser, Counsel to CenturyLink, Inc., Frontier Communications Corp., FairPoint Communications, Inc., and Consolidated Communications, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593, at 9 (filed Aug. 29, 2016) (asserting that Ethernet prices could continue to fall because of "technological advances and growing economies of scale").

[93] *See* NCTA FNPRM Reply Comments at 3-4 (describing cable provider investments in fiber and coax networks since 2013, in general without indicating whether those investments are used to provide business data services).

correct, do not mean that its own prices for Ethernet services have declined at its monopoly or duopoly locations in its footprint, because AT&T's calculations appear not to hold constant the number of in-building providers.[94] AT&T apparently does not control for the possibility that it was usually purchasing Ethernet connections at locations not served (in-building) by another CLEC in 2013 while usually purchasing those connections at locations served (in-building) by many CLECs today. Hence its assertions about Ethernet prices cannot be the basis for an inference that AT&T's own Ethernet prices have decreased at any of the locations in its ILEC footprint.

58.   Fifth, AT&T's broad brush assertion about the Ethernet business nationwide does not account for differences across local geographic markets. Ethernet prices and output can change in different ways in different regions. AT&T makes no effort to identify those differences or to tie them to differences in competition across those regions. Unless competition has increased in a similar way across the local markets where Ethernet prices declined, competition cannot explain the nationwide pricing trends.

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[94] *See* AT&T FNPRM Reply Comments at 23.

V.   The FCC Should Address ILEC Market Power

59.   Prof. Katz and Dr. Keating, along with Prof. Farrell, suggest that if the FCC concludes that competition lowers prices, it should take steps to foster CLEC entry and expansion.[95] But these commenters do not propose any concrete and practical steps the FCC could take to do so in order to remedy ILEC market power in business data services or explain why those steps would likely be effective. Nor would it be easy to foster CLEC entry and expansion given that it is not profitable for CLECs to build last-mile facilities to many locations where the ILECs serve customers.[96] By contrast, Prof. Willig has explained that at those locations where CLEC entry may be viable, regulation of wholesale prices can facilitate retail entry,[97] particularly by CLECs seeking to serve multi-location customers, and thus address ILEC market power in wholesale services directly and ILEC market power in retail services indirectly. Wholesale price regulation is not necessarily an alternative to fostering CLEC entry and expansion; it can be a way to accomplish that end.

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[95] Katz & Keating Reply Decl. ¶ 9; *see* Farrell Reply Decl. ¶ 1 (commending the FCC for looking for ways to protect competition and entry in the business data services industry); *see also* Katz & Keating Reply Decl. ¶ 9 (interpreting the inverse relationship between price and rivalry as suggesting that with more providers bidding for a customer's business, there is a greater likelihood that one of the providers would be an effective competitor, modeled as a very low unobservable cost of servicing the customer, and arguing that under such circumstances, policies to foster CLEC entry would be beneficial).

[96] *See* Baker Decl. ¶¶ 96-106; Merriman June Decl. ¶¶ 4-6; Schirack & Baer Decl. ¶¶ 16-18; Merriman Feb. Decl. ¶¶ 13-17.

[97] Willig Decl. ¶ 26.

60.   Moreover, the observation by Prof. Katz and Dr. Keating, along with

Prof. Farrell, that price regulation has both costs and benefits does not, on

its own, provide a basis for selecting a specific remedy for ILEC market

power;[98] all remedial options have both costs and benefits, as does the

option of not remedying the problem of ILEC exercise of market power.

While it is appropriate to consider both benefits and costs in formulating a

remedy, the substantial price elevation from ILEC market power in

business data services makes it likely that a range of regulatory

alternatives, if practical, would be beneficial on balance. The FCC's

adoption of a particular remedial alternative in this proceeding does not

mean that the same remedial alternative would be the best choice for

addressing market power outside of business data services.[99]

61.   Relatedly, AT&T suggests that a price regulation remedy could have

adverse effects on investment incentives.[100] As I have previously

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[98] Katz & Keating Reply Decl. ¶ 12; *see* Farrell Reply Decl. ¶ 5.

[99] Prof. Katz and Dr. Keating appear to suppose otherwise when discussing the implications of their assumption that supermarkets are exercising market power. Katz & Keating Reply Decl. ¶ 5. In any case, if the study they reference is taken at face value, it shows that Wal-Mart's entry leads large supermarket rivals to reduce price by a statistically insignificant 0.5%. Emil Basker & Michael Noel, *The Evolving Food Chain: Competitive Effects of Wal-Mart's Entry into the Supermarket Industry*, 18 J. ECON & MGMT. STRATEGY 977, 979 (2009). Hence, and contrary to their assumption, the study does not appear to indicate that large supermarkets exercise market power. By contrast, the empirical results for business data services show that the cumulative effect of rivalry may lead to ILEC price reductions of 50% or more.

[100] *See, e.g.*, AT&T FNPRM Reply Comments at 11 ("The risks of overregulation are especially acute for Ethernet services, where the sudden imposition of unnecessary rate regulation on these rapidly growing services could introduce severe disincentives for broadband investment and do lasting harm to the IP transition."); *id.* at 61-66 (discussing investment incentives associated with wholesale price regulation); *see also* Mayo Decl. ¶¶ 86-94; James E. Prieger, Investment in Business Broadband in Rural Areas, at 2, attached to Letter from Melissa Newman, Invest in Broadband for America, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 16-143, 15-247, & 05-25 (filed Aug. 8, 2016) ("Prieger White Paper").

explained, incentives for investment in business data services are unlikely

to be affected adversely by reasonable modifications to the regulatory

scheme for business data services to address ILEC market power.[101]

62.   Prof. Katz and Dr. Keating suggest that regulation of business data

services is likely to be inefficient because regulated prices are unlikely to

account for heterogeneity in the costs of serving customers and in the

range of service qualities provided.[102] These inefficiencies are unlikely to

be substantial for wholesale prices, which account for approximately 90%

of the ILEC connections in the data set used by Prof. Rysman, given that

the ILECs commonly place buildings in a small number of price buckets in

which they set prices identically across the buildings in an area served by a

wire center.[103]

63.   In a letter to the Commission, several economists who have

submitted declarations or reports in this proceeding on behalf of various

entities critical of the proposed rules state: "To the degree there are some

[business data services] markets with persistent monopoly power, we

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[101] Baker FNRPM Reply Decl. ¶¶ 17-19. Industry investment incentives cannot be evaluated by looking only to whether ILECs would charge a lower price if regulated; it is also necessary to look at CLEC investment incentives and to consider the likely competitive response of ILECs to CLEC investment. For example, the analysis by Prof. Raul Katz shows that lower backhaul costs will stimulate the deployment of wireless facilities, *see* Raul Katz, Assessment of the Impact of the Business Data Services Market Dynamics on Innovation and Competition in the U.S. Wireless Market, at 5-7, attached as Exhibit 1 to Reply Comments of Competitive Carriers Association, WC Docket Nos. 16-143, 15-247, & 05-25, RM-10593 (filed Aug. 9, 2016), which could benefit broadband deployment in the same rural areas where Prof. Prieger contends the ILECS will invest less. Prieger White Paper at 5-7.

[102] Katz & Keating Reply Decl. ¶ 52.

[103] Baker Decl. ¶ 94.

agree that it could be economically justified and welfare enhancing to reduce monopoly rents in such markets to a best approximation of competitive levels, to the extent such a goal can be achieved without imposing large costs on providers or disincentivizing investment."[104] The evidence summarized above indicates that the ILECs exercise substantial and persistent market power in business data services, and that investment incentives are unlikely to be affected adversely by a reasonable regulatory approach. Applying their test, it is likely that a range of regulatory alternatives would be beneficial on balance.[105]

VI.   Conclusion

64.   Nothing in the comments filed in this proceeding on or since August 9, 2016 leads me to question my conclusion that ILECs are likely able to exercise market power in the provision of business data services in most markets, from low bandwidths through at least 1 Gbps, and would be expected to charge prices above competitive levels unless prevented by regulation.

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[104] Letter from Joseph Farrell, Professor of Economics, University of California, Berkeley, et al., to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143, 15-247, & 05-25, at 4 (filed Sept. 14, 2016).

[105] Although I have not analyzed costs to providers, it is plausible to expect the benefits of addressing substantial and persistent market power to exceed those costs for a range of practical regulatory alternatives.

I declare under penalty of perjury that the foregoing is true and correct to the best of my information and belief.

_____   Executed on September 21, 2016

   Jonathan B. Baker