

Learning from Bad Technique: The *WIK-Consult Report* on Business Data Services

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Introduction

Last May, the Federal Communications Commission (“FCC”) launched a Notice of Proposed Rulemaking in which it set forth a “new regulatory framework” for Business Data Services (“BDS”), formerly known as Special Access Services.¹ BDS are high-capacity circuits sold by facilities-based communications companies to other communications companies and businesses. The Commission has entertained complaints about BDS rates being “too high” for about fifteen years, in part because of a 1999 deregulatory policy allowing pricing flexibility for the services.² But it’s not just the deregulated prices that are at issue; even those prices the Commission regulates today are claimed to be “too high.” At no risk of oversimplification, the BDS proceeding is all about rate regulation.

The need for rate regulation requires first a determination that there is market power, meaning that the observed prices or rates are above some “proper” level, usually defined with reference to economic cost or competitive outcomes. Yet, no party has provided the Commission with convincing evidence that prices are not “just and reasonable.”³ Instead, the unsupported claim that BDS prices “are too damn high” pretty much sums up the economic arguments, leaving the Agency little to work with and explaining its historical reluctance to intervene.⁴

But past is past and the current Commission under Chairman Tom Wheeler has signaled its determination to address and likely lower BDS rates. The regulatory paradigm it outlines in the *BDS NPRM* is to skirt the issue of evaluating market power altogether, and instead use the simple head-count of the number of competitors as a proxy. This analytical substitution is without validity in economic theory and especially inapt for telecommunications markets where fixed costs are large relative to market size.⁵ The *BDS NPRM* provides further evidence that the Agency now operates in an “economics free zone.”⁶

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As a result, the BDS proceeding has become a dumping ground for inexpert economic analysis (done mostly, but not always, by non-economists). While it’s unfortunate that such dross has been invited into the record, by studying the errors in such works it is possible for policymakers, advocates, and laypersons to obtain a better grasp of economic concepts relevant to telecommunications regulation. Earlier this year, for instance, I detailed a plethora of errors and internally-inconsistent

claims made in a report on BDS prices by the Consumer Federation of America (“CFA”).⁷

A more recent instance of unskilled economic analysis is a just-released report—prepared at the request of INCOMPAS (a trade group of BDS buyers seeking lower prices)—by J. Scott Marcus of WIK-Consult (a European consulting firm).⁸ Like the *CFA Report* before it, for reasons that are unclear the *WIK-Consult Report* claims that government-mandated price reductions will increase the revenues of the sellers of BDS. As I explain below, the *WIK-Consult Report* makes several serious errors in its analysis, including, but certainly not limited to, a focus on irrelevant factors, inaccurate computations, self-contradictory claims, and improper benchmarks. Given these errors, the Commission should accord no probative weight to the *WIK-Consult Report*, but that does not stop us from learning a few lessons about economics and its insights for regulatory action.

WIK-Consult’s Analysis

A claim that prices are “too high” requires that prices be compared to a proper benchmark, which typically is some meaningful measure of cost or competitive outcomes.⁹ No legitimate evidence on such a comparison has been entered into the record thus far, and WIK-Consult confirms this by noting that the basis for its numerical analyses are simply contentions: “[m]any have contended that the prices of Ethernet leased line equivalents are in excess of cost and in excess of the levels that could be expected in a competitive market. Likewise they contend that prices of TDM-based leased line equivalents are also well in excess of cost and competitive levels.”¹⁰

Despite offering no useful evidence that prices are, in fact, too high, WIK-Consult seeks to analyze the effects of mandatory price cuts. Further, WIK-Consult states that it “[does] not attempt to quantify what the ‘right’ reduction in price should be.”¹¹ Instead, like the *CFA Report* before it, the *WIK-Consult Report* simply assumes

that a price reduction is the right thing to do and then attempts to calculate the effect of hypothetical price cuts on the total revenues of firms selling these services (among other related effects).

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To begin, I must admit that this fascination with total revenues is a mystery to me. The legal standard for evaluating whether rates are “just and reasonable” rises or falls on whether the profits these rates return are either confiscatory on the low end or excessive (i.e., “creamy”) on the high-end, not their revenue effects.¹² The Communications Act does not mandate that any regulatory price-cut lead to a rise (or fall) in total revenues. The “just and reasonable” standard of Section 201 rate regulation is focused on financial returns and Section 202’s non-discrimination mandate is somewhat an implicit rejection of revenue considerations.¹³

Why bother with an analysis of revenues? Enron had over \$100 billion in revenue the year before it declared bankruptcy.¹⁴ The only justification the *WIK-Consult Report* provides for the analysis is that “[t]here is a natural tendency to assume that a reduction in price translates into a reduction in revenue for the provider of the service.”¹⁵ For someone who lacks any formal training in economics,¹⁶ perhaps that may be true, but it unclear how clearing up this ignorance-induced error helps an expert agency (employing many economists) regulate BDS.

WIK-Consult Methodology

The method employed in the *WIK-Consult Report* is rather straightforward. Even so, WIK-Consult manages to bungle the analysis. Let me explain.

Every principles text in economics includes a discussion about the relationship of price changes to total revenues. It is a concept taught in every first course in economics in the discussion of the concept of the *own-price elasticity of demand*.¹⁷

Total revenue is price times quantity, and by the law of demand price and quantity are inversely related (i.e., demand slopes downward). So, whether total revenues rise when price falls depends on how much quantity increases, and the own-price elasticity of demand is a measure of that quantity change. The own-price elasticity of demand (E , which is a non-positive number) is the percentage change in quantity ($\% \Delta Q$) divided by the percentage change in that good or service's own price ($\% \Delta P$), or

$$E = \% \Delta Q / \% \Delta P, \quad (1)$$

which can be rearranged for present purposes as,

$$\% \Delta Q = E \cdot \% \Delta P. \quad (2)$$

If the demand curve is *elastic* ($E < -1$), then that means the percentage change in quantity is bigger (in absolute value) than the percentage change in price. If so, then a price reduction will increase revenues. If the demand curve is *inelastic* ($-1 < E \leq 0$), then that means the percentage change in quantity is smaller (in absolute value) than the percentage change in price, implying a price cut will reduce revenues. If the demand curve is unit elastic ($E = -1$), then the percentage changes in price and quantity are equal (in absolute value) and offsetting, so that a price cut has no effect on revenues.

To see the revenue effect more clearly, we can write the effect of a price change on total revenue (TR) as,

$$\% \Delta TR = (E + 1) \cdot \% \Delta P. \quad (3)$$

As noted above but seen more clearly here, if the own-price elasticity is -1 , for instance, then the change in total revenue is zero. If the demand elasticity is -0.5 (inelastic), then the percentage change in revenue is 50% of the percentage change in price and revenues decline. Or, if the demand elasticity is -2 (elastic), then the percentage change in revenues is equal to the negative of the percentage change in price (lowering price would increase revenue).

For unknown reasons, the advocates for increased regulation of BDS believe that if the regulatory price cut increase revenues, then it is legitimate regulatory action. While there is no basis for this belief, the desire to claim revenues will rise (or not fall) points to the obvious analytical solution: like the *CFA Report* before it, WIK-Consult argues that the own-price demand elasticity is elastic, meaning that a regulatory mandated price cut will increase quantity by an amount large enough to make revenues rise. WIK-Consult considers only elasticity values in the elastic region of demand (or, at least an attempt is made to do so, as explained later).¹⁸

What does this say about proper rate regulation? Absolutely nothing – and WIK-Consult offers no explanation. In fact, most rate regulation is applied to goods with highly inelastic demand curves, like traditional phone services (with an elasticity approaching zero).¹⁹ Nevertheless, INCOMPAS, who contracted with WIK-Consult to produce the report, seems to believe the revenue effects are relevant, so let's study the analysis to see if it is done properly.

Below, I will address four key errors in the *WIK-Consult Report*, which may be categorized as follows: (a) an improper focus on revenue effects and resulting self-contradictory claims; (b) computational errors; (c) improper benchmarks

caused by an apparent ignorance of the basic economics of telecommunications; and (d) the analysis of a demand curve that is presumed out of thin air.

Irrelevance of Total Revenue

The effect of a price cut on total revenues has nothing to do with the regulation of BDS services. Rate regulation is justified only when prices are well-above costs and some plausible regulatory solution exists that doesn't do more harm than good. No professional analysis of regulation considers the revenue effects of a price cut, absent some "revenue neutrality" mandate or rate-of-return requirement. Neither are relevant to BDS.

What is odd about this focus on revenue is that it actually supports deregulation rather than the regulatory activity proponents of aggressive BDS regulation desire. Consider a simple example. Say we have Monopolist A with an elasticity of -1.5 and Monopolist B with an elasticity of -3.0. Based on the Lerner Index of Market Power,

$$L = (P - MC)/P = 1/|E|, \quad (4)$$

where MC is marginal cost.²⁰ Monopolist A has twice as much market power as Monopolist B. Yet, an equivalent price cut will lead to significantly larger revenues increases for Monopolist B.

Thus, looking at revenue changes sends exactly the wrong signal about the need for regulation. It is well-understood in regulatory and antitrust economics that the more elastic is demand, the less is the need for regulation or antitrust action. As observed by Kaserman and Mayo in their book *GOVERNMENT AND BUSINESS*, discussing the seminal works by Saving (1970) and Landes and Posner (1981):

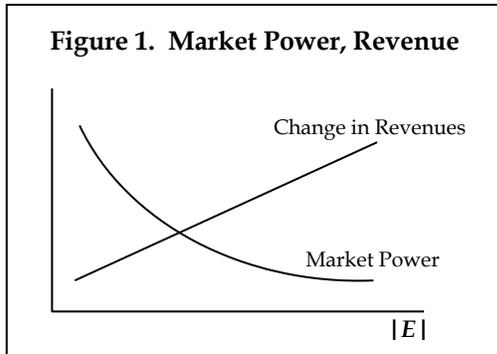
... the degree of market power enjoyed by the dominant firm will be inversely related to the price elasticity of total market demand []. Thus, in markets where consumers are highly

sensitive to price changes, the ability of any firm to increase price by withholding supply will be restricted, even if that firm is the sole supplier.²¹

Even the Commission's *BDS NPRM*, which is no example of clear thinking, recognizes the economic principle that a "highly elastic demand [eliminates] the ability to raise price over competitive levels."²²

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So, the more elastic is the demand curve, the less need for regulation. Yet, the more elastic is demand, the larger the revenue increase for a price cut. Figure 1 illustrates the relationship. On the horizontal axis is the (absolute value of the) own-price elasticity of demand. Two curves are provided, one is the Lerner Index of Market Power and the other is the percentage change in revenue for a price cut (of constant magnitude). This figure clearly demonstrates that the larger the increase in revenues from a price cut, the less market power there is (defined as the relationship between price and marginal cost).



Apparently not grasping this concept, and not realizing the self-contradiction, WIK-Consult asserts, “[t]here is good reason to believe that the price elasticity of demand for these services is high.”²³ But if this is true, then there is no reason to believe that BDS regulation is needed. WIK-Consult’s elasticity analysis provides a regulatory implication that is precisely backwards from that desired by its sponsor, INCOMPAS.

WIK-Consult asserts, “[t]here is good reason to believe that the price elasticity of demand for these services is high.” But if this is true, then there is no reason to believe that BDS regulation is needed.

Bad Math

WIK-Consult states that “[f]or ease of exposition, we treat price elasticity here as a constant (as is often done).”²⁴ Then, an example is provided,

.. when the percentage change in price is fairly small, and at [an own-price elasticity of demand] of -1, the overall change in gross revenue is minimal. For example, a reduction of 10% in price leads to a reduction of only 1% in total revenue.²⁵

Obviously, this example is incorrect. If the elasticity is -1 and constant, then revenues are unchanged by a change in price.

There are two sources for this most basic error. First, WIK-Consult says it is holding the elasticity constant across all prices, yet the formula it uses is incompatible with that assumption.²⁶ The formula used assumes a linear demand curve—one that cannot mathematically support a constant elasticity. This fact is plain from Figure 2 of the *WIK-Consult Report* since all elasticities considered in the figure are assumed to be less than or equal to -1 yet revenues sometimes decline. Also, the revenue effect changes with the size of the price change, again indicating the elasticity is not being held constant.

Second, the formula WIK-Consult uses is valid only for infinitesimal price changes. For instance, with an elasticity of -1, a price change of -0.01 percent leads to revenue change of 0.01%, which is still not equal to zero. The formula used requires infinitesimally small price changes to be valid. Yet, WIK-Consult contemplates prices change of no less than 5% and as large as 25%.²⁷ In fairness, it’s a common mistake made by laypersons (including students) doing economic analysis. (In fact, I’m sensitive to the error because I recall making it as an undergraduate student in my first economics course.)

Irrelevant Benchmarks

WIK-Consult is principally but not solely interested in revenue effects; an analysis of surplus is also included, but this work is likewise botched.²⁸ Here, WIK-Consult, in an effort to “review the basic economics,” provides the familiar supply-demand figure (with constant marginal cost) to illustrate the concept of deadweight loss.²⁹

Since WIK-Consult proposes to explain “basic economics,” I’ll risk the accusation of being a bit persnickety to point out a number of gaffes

committed by WIK-Consult in discussing the figure. For instance, WIK-Consult describes the demand curve as the “consumer demand curve,” when it is intended to be market demand curve. Also, the *WIK-Consult Report* says that “higher prices” lead to “lower consumption” and this is “due to the price elasticity of demand.” In fact, the inverse relationship is true due to the law of demand (demand slopes downward); the elasticity of demand describes (in a dimensionless manner) the particular relationship of price and demand at any given point along the demand curve. Finally, while WIK-Consult never asserts BDS are sold under monopoly conditions, its client does, and this is important because there is no supply curve under monopoly.

More substantively, WIK-Consult states that “the supply curve ... is usually not critical to the discussion.”³⁰ The claim is demonstrably false. In discussing the deadweight loss, WIK-Consult relies on the assumption that marginal cost is the “optimal pricing point in an ideal competitive market.”³¹ Yet, it is well-established that the “ideal competitive market” is not relevant to telecommunications services. Telecommunications requires massive fixed and sunk costs leading to increasing returns. In fact, as is well known by economists, in the presence of “decreasing average cost[,] a competitive equilibrium does not exist.”³² Thus, WIK-Consult’s depiction of the “ideal competitive market” is not even an equilibrium in telecommunications markets.

The irrelevance of the “ideal competitive market” for telecommunications policy is well established in the literature. For instance, economists Roger Blair and Christine Piette, in *ANTITRUST BULLETIN*, observe:

The production of local telephone service is marked by substantial economies of scale, which means that average cost declines with increases in output and marginal costs are below average cost. As a result, textbook competition, which involves marginal cost

pricing, is infeasible as all firms would have negative profits.³³

Quotes like these are in abundant supply. Marginal cost and perfect competition are not relevant cost or price benchmarks for BDS or nearly any other telecommunication service. A reliance on an irrelevant benchmark dooms the WIK-Consult analysis.

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There is No Market Demand Curve

WIK-Consult’s analysis, as well as the analyses by the Commission and many of the advocates for and against BDS regulation, is based on reference to a market demand curve. Yet, WIK-Consult never defines the market for BDS. The Commission and those calling for more regulation the market for BDS as “location” or “customer” specific.³⁴ That is, BDS customers are buying connectivity at specific locations. Thus, there is no centralized market for BDS, so there is no market demand curve for BDS, and consequently there is no price elasticity of market demand.³⁵ All the calculations in the *WIK-Consult Report* (and the studies it relies on) are based on a market that does not exist; WIK-Consult is studying a fantasy.³⁶

As shown in Beard, Ford and Spiwak (2014), customer-specific markets for BDS—a definition chosen by the Commission and the advocates for regulation—implies countervailing market power.³⁷ As a result of this bilateral monopoly and the purchase of connectivity (a single thing), regulating BDS serves only to transfer wealth from sellers to buyers. It’s a pure transfer,

except for the fact the regulation imposes cost. As a result, regulating BDS must reduce social surplus and is ill-advised.

Conclusion

At the risk of naivety, we might view the BDS proceeding as a regulator doing its assigned task – protecting consumers against a monopolist earning excessive profits by charging high prices. More realistically, I think, the BDS proceeding is about a number of large, politically-favored communications firms using the regulatory system to their advantage to extract economic surplus from other communications firms. It's the typical stuff predicted by the private-interest and interest-group theories of regulation.

I submit that my take on the BDS proceeding is well-supported by the evidence. First, no evidence has been presented to or crafted by the Commission providing a legitimate economic basis for intervention. Second, the advocates for more regulation have turned to fantasy and misdirection. A media campaign has been launched by the buyers of BDS to distract the public with flowery promises (e.g., lower prices, competition, innovation, investment, and so forth), while in fact they are merely requesting a massive wealth transfer they have been unable to justify based on sound economic analysis and empirical work. The *WIK-Consult Report* in just another entry into this charade.

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¹ *In the Matter of Business Data Services in an Internet Protocol Environment; Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans; Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, FCC 16-54, TARIFF INVESTIGATION ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING, 31 FCC Rcd. 4723 (rel. May 2, 2016) (hereinafter “BDS NPRM”).

² *In re Access Charge Reform*, FIFTH REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING, 14 FCC Rcd. 14221, FCC 99-206 (rel. 27 Aug. 1999) (*Pricing Flexibility Order*).

³ G.S. Ford and L.J. Spiwak, *The Need for Better Analysis of High Capacity Services*, 28 JOHN MARSHALL JOURNAL COMPUTER & INFORMATION LAW 343-384 (2011) (available at: <http://phoenix-center.org/JCILSpecialAccess.pdf>).

⁴ Quote is attributed to Jimmy McMillan, perennial candidate for multiple federal and state offices (<http://www.rentistoodamhigh.org>).

⁵ G.S. Ford, *The Road to Nowhere: Regulatory Implications of the FCC’s Special Access Data Request*, PHOENIX CENTER POLICY PERSPECTIVE NO. 16-02 (February 23, 2016) (available at: <http://www.phoenix-center.org/perspectives/Perspective16-02Final.pdf>).

⁶ L.G. Crovits, ‘Economics-Free’ Obamanet, WALL STREET JOURNAL (January 31, 2016) (available at: <http://www.wsj.com/articles/economics-free-obamanet-1454282427>).

⁷ G.S. Ford, *Cost or Benefit? A Review of the Consumer Federation of America’s Report on Regulating Special Access Services*, PHOENIX CENTER POLICY PERSPECTIVE No. 16-04 (April 18, 2016) (available at: <http://phoenix-center.org/perspectives/Perspective16-04Final.pdf>).

⁸ J. Scott Marcus, *Welfare Effects of Reductions in the Price of Leased Line Equivalents in the U.S.*, WIK-Consult GmbH (July 16, 2016) (available at: <https://ecfsapi.fcc.gov/file/1072827487959/WIK-Consult%20Report.pdf#viewer.action=download>) (hereinafter “WIK-Consult Report”) at p. 1, filed by INCOMPAS in FCC Docket Nos. 16-143 and Docket No. 05-25 (July 28, 2016) (available at: <https://ecfsapi.fcc.gov/file/1072827487959/Cover%20Letter%20for%20WIK%20Report.pdf#viewer.action=download>). It should be noted that Mr. Marcus makes many of the same errors I highlighted in the CFA Report, *id.*

⁹ G.S. Ford and L.J. Spiwak, *The Need for Better Analysis of High Capacity Services*, 28 JOHN MARSHALL JOURNAL COMPUTER & INFORMATION LAW 343-384 (2011) (available at: <http://phoenix-center.org/JCILSpecialAccess.pdf>).

¹⁰ *WIK-Consult Report*, *supra* n. 8 at p. 1.

¹¹ *Id.* at p. 8.

¹² Section 201 and 202 of the Communications Act requires the commission to set just and reasonable and non-discriminatory rates. See 47 USC §§ 201-202. See, e.g., *In re Permian Basin Area Rate Cases*, 390 U.S. 747, 792 (1978); *Farmers Union Cent. Exch. v. FERC*, 734 F.2d 1486, 1497 (D.C. Cir.), *cert denied sub nom., Williams Pipe Line Co. v. Farmers Union Cent. Exch.*, 469 U.S. 1034 (1984).

¹³ Total revenues are expected to rise when a firm price discriminates in a manner that is welfare improving.

¹⁴ *Enron Annual Report 2000* (available at <http://picker.uchicago.edu/Enron/EnronAnnualReport2000.pdf>).

¹⁵ *WIK-Consult Report*, *supra* n. 8 at p. 8.

¹⁶ <http://www.scottmarcus.de> (“I am best known as an economist, but my academic training is as a political scientist (with a specialty in public administration) and as an engineer.”).

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¹⁷ See, e.g., R.B. Ekelund Jr., and R.D. Tollison, *ECONOMICS* (1994), at pp. 125-126, or any other principles-level textbook. A basic description of the own-price elasticity of demand is available at: <http://www.investopedia.com/university/economics/economics4.asp>.

¹⁸ WIK-Consult also makes no attempt to verify whether demand for BDS actually is elastic or not, choosing instead to rely on a report issued in 2003 and based on data collected between 1993 and 2001 to support its assumptions. See P.N. Rappaport, L.D. Taylor, A.S. Menko, and T.L. Brand, *Macroeconomic Benefits from a Reduction in Special Access Price* (2003). Given the significant changes that have occurred in BDS prices, market size and nature of demand over fifteen to twenty years, the validity of this assertion is highly questionable. And, as detailed later, there is no market demand curve for BDS, so the results from this study cannot quantify the elasticity of demand. WIK-Consult also refers to the claimed experience of one INCOMPAS member, but no econometric data are offered to support a claim that all of BT's volume increases are attributable to the alleged price reductions—or that the competitive situation of the United Kingdom matches that for BDS in the United States.

¹⁹ L. Taylor, *TELECOMMUNICATIONS DEMAND IN THEORY AND PRACTICE* (1993).

²⁰ Marginal cost is the cost standard used by WIK-Consult for its analysis. As any student of telecommunications economics understands, marginal cost is not a meaningful benchmark for telecommunications markets. This index of market power has no relevance in markets with increasing returns (scale economies), and thus has no relevance for telecommunications regulation. For coverage of the literature on this point, see, e.g., *Road to Nowhere*, *supra* n. ___; G.S. Ford and L.J. Spiwak, *The Impossible Dream: Forbearance After the Phoenix Order*, PHOENIX CENTER PERSPECTIVE No. 10-08 (December 16, 2010) (available at: <http://www.phoenix-center.org/perspectives/Perspective10-08Final.pdf>); T.R. Beard, G.S. Ford, L.J. Spiwak, and M. Stern, *Wobbling Back to the Fire: Economic Efficiency and the Creation of a Retail Market for Set-Top Boxes*, 21 *COMMLAW CONSPECTUS* 1-58 (2012), at pp. 38-48.

²¹ D.L. Kaserman and J.W. Mayo, *GOVERNMENT AND BUSINESS: THE ECONOMICS AND ANTITRUST AND REGULATION* (1995), at p. 107; T.R. Saving, *Concentration Ratios and the Degree of Monopoly*, 11 *INTERNATIONAL ECONOMIC REVIEW* 139-146 (1970); W.M. Landes and R.A. Posner, *Market Power in Antitrust Cases*, 94 *HARVARD LAW REVIEW* 937-996 (1981).

²² *BDS NPRM*, *supra* n. 1 at ¶ 157.

²³ *WIK-Consult Report*, *supra* n. 8 at p. 8.

²⁴ *Id.* at ft. 17.

²⁵ *Id.* at p. 15.

²⁶ *Id.* at pp. 14-15.

²⁷ WIK-Consult's analysis is not as bad as the CFA's in at least one respect - it does not make computations based on a constant elasticity demand curve. Yet, WIK-Consult assumes a constant elasticity demand curve, so it's mistake of a different but still telling nature.

²⁸ *WIK-Consult Report*, *supra* n. 8 at pp. 9-10.

²⁹ *Id.* at Figure 1. When a monopolist raises price above marginal cost, surplus is lost in the sense neither the seller nor the buyers get it. This lost surplus is labeled a deadweight loss.

³⁰ *Id.*

³¹ *Id.*

³² O. Shy, *INDUSTRIAL ORGANIZATION* (1995) at p. 67.

³³ R. Blair and C. Piette, *The Interface of Antitrust and Regulation: Trinko*, 50 *ANTITRUST BULLETIN* 665-685 (2005).

³⁴ T.R. Beard, G.S. Ford, and L.J. Spiwak, *Market Definition and the Economic Effects of Special Access Price Regulation*, 22 *COMMLAW CONSPECTUS* 237-266 (2014) (available at: <http://scholarship.law.edu/commlaw/vol22/iss2/10>).

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³⁵ This fact does not imply that an inverse relationship between aggregate quantities and prices cannot be observed, but this relationship is not a demand curve. *Market Definition, id.* at pp. 263-4.

³⁶ See, e.g., Rappaport, *et al.*, *supra* n. 18.

³⁷ *Market Definition, supra* n. 34.