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FOUNDED 1866

June 13, 2013

BY ECFS

Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268; *Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269

Dear Ms. Dortch:

With this letter, AT&T Inc. (“AT&T”) submits the following two papers in response to recent submissions in the above-captioned dockets: (1) “Comment on the Submission of the U.S. Department of Justice Regarding Auction Participation Restrictions,” by Professors Michael L. Katz and Philip A. Haile and Doctors Mark A. Israel and Andres V. Lerner (“the economists”)¹ (“*Economist Response to DOJ*”),² and (2) “Comments on Appropriate Spectrum Aggregation Policy with Application to Upcoming 600 MHz Auction,” a supplemental reply declaration by the same authors responding to various expert declarations submitted in the reply rounds of the Commission’s 600 MHz auction and spectrum holdings proceedings (“*Auction Supplemental Reply*”).

In their *Response to DOJ*, the economists explain that there is no sound basis for the DOJ’s recent suggestion that the Commission should restrict the ability of AT&T and Verizon Wireless to compete for spectrum in the upcoming 600 MHz auction to ensure that Sprint Nextel (Sprint) and T-Mobile can acquire spectrum. As the economists explain, the DOJ’s speculative concern that an incumbent might seek to “foreclose” rivals by bidding for spectrum that it does

¹ Professor Katz is the Sarin Chair in Strategy and Leadership, University of California Berkeley, and has previously served as the Chief Economist at both the U.S. Department of Justice and the Federal Communications Commission. Professor Haile is the Ford Foundation Professor of Economics, Yale University. Drs. Israel and Lerner are Executive Vice Presidents at Compass Lexecon, one of the world’s leading consulting firms specializing in economic analysis.

² See *Ex Parte* Submission of the United States Department of Justice, WT Docket No. 12-269 (filed April 11, 2013).

Marlene Dortch
Page 2

not need is “belied by the facts.”³ Current marketplace realities make any foreclosure strategy “especially unlikely” to succeed, especially against Sprint or T-Mobile, both of which already hold large amounts of spectrum.⁴ The economists conclude that the DOJ “argues for a policy that manifestly favors some competitors over others” and for spectrum aggregation rules that “would distort competition, harm consumers, and risk undermining the upcoming incentive auctions.”⁵

The DOJ’s speculation that Sprint and T-Mobile have a special need for low-frequency spectrum and will be foreclosed from competing effectively without it also lacks “any grounding in facts or economic logic.”⁶ The DOJ argues to the contrary based on the assertion that it costs more to deploy high-frequency spectrum than low-frequency spectrum in rural areas, but this argument is specious because deployment costs are only part of the costs of building and operating a network: the *total* cost of providing service, which is the relevant consideration, includes the cost of network buildout *and* spectrum. And on that score, basic economic principles teach that the marketplace value of low-frequency and high-frequency spectrum rights will tend to adjust to ensure that the “*full cost* of entry or expansion” is equalized.⁷ This “equalization of total costs renders the possibility of foreclosure through hoarding low-frequency spectrum alone remote at best.”⁸ “In fact, Sprint and T-Mobile both have built competitive nationwide networks relying almost entirely on high-frequency spectrum, and have consistently decided not to acquire low-frequency spectrum at auction or in the secondary market.”⁹

The *Response to DOJ* further explains that, contrary to the DOJ’s suggestion, *ex ante* rules to limit auction participation would be inconsistent with economic principles. The DOJ’s putative concern is that post-auction review would delay regulatory approvals or strain agency resources. “Both arguments are red herrings.”¹⁰ “Because of the need to clear the spectrum of broadcast television operations and develop new mobile wireless standards and equipment, there will be a period of several years during which regulatory review could take place without delaying ultimate market deployment.”¹¹ And “only those transactions involving spectrum

³ *Economist Response to DOJ* at ¶ 4.

⁴ *Id.* at ¶¶ 4-5.

⁵ *Id.* at ¶ 12.

⁶ *Id.* at ¶ 6.

⁷ *Id.* at ¶ 7.

⁸ *Id.*

⁹ *Id.* at ¶ 8.

¹⁰ *Id.* at ¶ 10.

¹¹ *Id.*

acquisitions above the safe harbor would have to be reviewed” in all events.¹² The rigid spectrum caps proposed by DOJ, by contrast, not only would inhibit the allocation of spectrum to its most valued uses, but would reduce revenue in the forward auction – a potentially catastrophic restriction that could limit how much spectrum can be reallocated to mobile uses and threaten the ability to fund other important initiatives like public safety.¹³

The *Auction Supplemental Reply* discusses each of these issues in further depth. For example, with respect to whether the threat of foreclosure might discourage participation in the auction, the economists explain that the suggestion that Sprint, T-Mobile and others would sit out the auction because of the costs of participating is “far-fetched” given the number of licenses in play, the likelihood that smaller providers would be the highest-value users for some of those licenses, and the proposed auction structure.¹⁴ And in response to claims that the Commission should treat low-frequency spectrum differently, the economists note that all parties agree that the propagation differences between high-and low-frequency spectrum manifest themselves primarily in rural areas, and the economists emphasize that there are no “credible claims that spectrum scarcity limits competition in rural areas, let alone credible claims of spectrum-based foreclosure in rural areas.”¹⁵

The economists also address Professor Baker’s argument that even if an entrant buys high-frequency spectrum at a sufficiently discounted price (relative to what an incumbent firm pays for low-frequency spectrum) such that it *could* provide equivalent service to an incumbent firm at the same total cost (summing both the cost of spectrum and the cost of build out), the entrant may *choose* to “spend less on buildout and offer service with less coverage, more limited building penetration, or lower capacity” – thus providing so-called “targeted service.”¹⁶ Notably, Professor Baker’s argument assumes the economists’ central point, which is that holders of low- and high-frequency spectrum can offer equivalent service at the same cost (*i.e.*, the combined cost of spectrum and buildout). And the “choice by an entrant to use assets that are capable of replicating an incumbent’s competitive strategy at the same cost instead to pursue an alternative competitive strategy is clearly *not* an example of foreclosure of access to inputs needed to provide competitive service.”¹⁷

¹² *Id.*

¹³ *Id.* at ¶ 11.

¹⁴ *Auction Supplemental Reply* at ¶¶ 15-19.

¹⁵ *Id.* at ¶ 45.

¹⁶ *Id.* ¶¶ 53-55; see Jonathan Baker, Spectrum Auction Rules that Foster Mobile Wireless Competition, March 12, 2013, Attachment to Reply Comments of T-Mobile USA, GN Docket No. 12-268, at 16-18.

¹⁷ *Id.* at ¶ 54.

Marlene Dortch
Page 4

In short, these papers demonstrate that restrictions that limit the participation of AT&T and Verizon in the 600 MHz auction are unnecessary and would be affirmatively harmful. Proponents of such restrictions rest their arguments on the false premise that low- and high-frequency spectrum are not substitutable inputs. But their generalized claims that low-frequency spectrum has superior propagation characteristics and thus lower build-out costs in rural areas miss the point, because any savings in build out costs will drive higher spectrum acquisition costs. Simply put, you either pay more on the front end, or you pay more on the back end. It is basic economics, and it explains why neither Sprint nor T-Mobile has found it necessary to seek a significant low-frequency spectrum portfolio to date. Their sudden insistence at this juncture on the necessity of rules that ensure their ability to obtain low-frequency spectrum is a makeweight argument designed to game the 600 MHz auction rules to their own advantage.

The rules they advocate, moreover, would cause significant consumer harm. In that regard, their claims that restricting the ability of AT&T and Verizon to participate will somehow increase auction revenues rest on theories that have no application to today's dynamic wireless marketplace, and they are belied by experience in prior auctions. In fact, auction restrictions will *at best* disort auction results, diverting scarce spectrum from its most efficient use and reduce auction revenues, effectively forcing U.S. taxpayers to finance the spectrum purchases of well-heeled carriers with deep pockets of their own. At worst, such restrictions will cause the auction to fail altogether, denying everyone the spectrum that is needed to maintain U.S. leadership in the mobile broadband world and thwarting the promise of a long overdue national public safety network.

Sincerely,



David L. Lawson
Counsel for AT&T

cc: Ruth Milkman
William Lake
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**COMMENT ON THE SUBMISSION OF THE U.S. DEPARTMENT OF
JUSTICE REGARDING AUCTION PARTICIPATION RESTRICTIONS**

**Michael L. Katz, Philip A. Haile,
Mark A. Israel, and Andres V. Lerner***

Policies Regarding Mobile Spectrum Holdings, WT Docket No. 12-269

JUNE 13, 2013

* Katz: Sarin Chair in Strategy and Leadership, University of California Berkeley; Haile: Ford Foundation Professor of Economics, Yale University; Israel: Executive Vice President, Compass Lexecon; Lerner: Executive Vice President, Compass Lexecon.

1. In various combinations, we have submitted declarations in the proceeding on the upcoming 600 MHz auctions and in the present proceeding on policies regarding mobile spectrum holdings.¹ Subsequent to the filing of our most recent declaration, the Antitrust Division of the U.S. Department of Justice (the Division) filed an *ex parte* letter in the present proceeding.² We have been asked by counsel for AT&T to comment on the economic analysis in this letter and in a letter submitted by T-Mobile USA, Inc. (T-Mobile) supporting the Division's recommendations.³ Unfortunately, these letters offer little economic analysis on which to comment, and fail to address the extensive facts and economic analysis already on record in these proceedings.

2. The Division's letter begins with several broad and unexceptionable points regarding the application of competition policy to mobile wireless telecommunications services, including descriptions of the objectives of antitrust enforcement, the benefits of competition, the Division's practices with respect to market definition, and the theory of foreclosure. From these general observations the Division makes an unwarranted leap to recommending that the Federal Communications Commission (the Commission) restrict the ability of AT&T and Verizon Wireless to compete for spectrum in the upcoming 600 MHz auction in order to ensure that Sprint Nextel (Sprint) and T-Mobile can acquire spectrum in the auction.

¹ Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268.

² *Ex Parte* Submission of the United States Department of Justice, WT Docket No. 12-269 (filed April 11, 2013) ("*DOJ Submission*").

³ Letter from Thomas J. Sugrue, Senior Vice President, Government Affairs, T-Mobile USA, Inc., to Chairman Julius Genachowski *et al.*, WT Docket No. 12-269 (filed May 7, 2013) ("*T-Mobile Letter*").

3. Long-held principles of American antitrust policy dictate that: (a) drastic market intervention (including restrictions on auction participation) be undertaken only when careful, fact-based economic analysis reveals substantial risk of significant competitive harm from inaction, and (b) any intervention be designed to protect competition rather than specific competitors. The Division’s letter departs from both principles. First, it fails to engage with the large body of evidence and analysis already submitted in these proceedings, instead offering little more than theoretical suppositions and unfounded speculation and then proceeding as if such speculation constituted sound evidentiary analysis. Indeed, rather than engaging with the facts of this market, the Division suggests that the burden is on AT&T and Verizon Wireless to demonstrate that their access to new spectrum should not be restricted.⁴ Second, the Division argues for a policy that manifestly favors some competitors over others. The Division’s claims regarding the dangers of allowing AT&T and Verizon Wireless to compete for spectrum and its implicit view that Sprint and T-Mobile face spectrum constraints whereas AT&T and Verizon Wireless do not run counter to market facts and economic logic already in the records of the relevant proceedings. The T-Mobile letter neither corrects the core flaws in the Division’s logic nor contributes any facts or economic analysis to address their lack in the Division’s letter.

4. The Division’s primary concern is that “carriers with large market shares could pursue an input foreclosure strategy at auction,”⁵ by “buying up significant quantities of spectrum independent of [their] need for that spectrum or [their] intention to use it in a timely manner.”⁶ The Division explains that, in theory, an incumbent firm with market power might hope to

⁴ *DOJ Submission* at 12.

⁵ *DOJ Submission* at 16.

⁶ *DOJ Submission* at 15.

foreclose rivals, and the associated “foreclosure value” might make a large incumbent willing to bid more for spectrum licenses at auction than smaller incumbents or new entrants.⁷ However, the Division provides no analysis of the extent to which such foreclosure is likely given mobile wireless market conditions; it merely speculates that there is “serious potential” for foreclosure.⁸ As we have demonstrated at length in our previous submissions, this speculation is belied by the facts. Foreclosure through excess spectrum acquisition is highly unlikely due to the number of rivals competing in wireless markets, the breadth of their existing spectrum holdings, the ability of competitors to offer wireless services with a small fraction of the available spectrum, the large and growing amount of spectrum that would thus need to be acquired to implement a foreclosure strategy, the small percentage of total available spectrum available in any single auction (including the upcoming 600 MHz auction), and the availability of alternatives to spectrum acquisition for capacity and coverage expansion (*e.g.* cell splitting).⁹

5. Foreclosure is especially unlikely with regard to Sprint and T-Mobile. Sprint already has access to more spectrum than either AT&T or Verizon Wireless. T-Mobile has recently acquired substantial amounts of spectrum in transactions with AT&T and Verizon Wireless, as well as

⁷ *DOJ Submission* at 10-11.

⁸ *DOJ Submission* at 16. Similarly, T-Mobile claims “the concept of ‘foreclosure value’ is well grounded in basic economic principles” but it offers no facts or analysis supporting its speculation that there is a significant “danger of foreclosure” in mobile wireless markets. (*T-Mobile Letter* at 6.)

⁹ See Mark A. Israel and Michael L. Katz, *Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings*, November 28, 2012 (hereinafter, *Israel and Katz Initial Declaration*), Attachment A to Comments of AT&T Inc., *In the Matter of Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, ¶¶ 26-32; Mark A. Israel and Michael L. Katz, *Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings (Reply Declaration)*, January 7, 2013 (hereinafter, *Israel and Katz Reply Declaration*), Attachment B to Reply Comments of AT&T Inc., WT Docket No. 12-269, ¶¶ 10-21; Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, *Spectrum Aggregation Policy, Spectrum-Holdings-Based Bidding, and Unlicensed Spectrum*, March 12, 2013 (hereinafter *Katz-Israel-Haile-Lerner Reply Declaration*), Exhibit B to Reply Comments of AT&T Inc., GN Docket No. 12-268, ¶ 9.

through its merger with MetroPCS. Both Sprint and T-Mobile offer unlimited service plans, which suggests that spectrum shortages are not a significant concern for them. In fact, a recent T-Mobile advertisement claims that its network is far less congested than that of another carrier, widely understood to be AT&T.¹⁰ In the glaring absence of compelling evidence that there exists a substantial risk of foreclosure and that standard antitrust policy is inadequate, one should not take seriously the Division's recommendation that the Commission rig the 600 MHz auction against AT&T and Verizon Wireless in favor of Sprint and T-Mobile.

6. A second recommendation by the Division is to give special status to low-frequency spectrum. The Division correctly observes that low- and high-frequency spectrum have different propagation characteristics, and that low-frequency spectrum can have lower network build-out costs in rural areas.^{11, 12} However, the Division then proceeds to speculate—without any grounding in facts or economic logic—that low-frequency spectrum is an essential input for Sprint and T-Mobile and that there is a substantial risk that these firms will be foreclosed from competing because they will be unable to obtain low-frequency spectrum.¹³

¹⁰ See, e.g., PhoneArena.com, “T-Mobile ad attacks AT&T for having slow pipes,” available at http://www.phonearena.com/news/T-Mobile-ad-attacks-AT-T-for-having-slow-pipes_id42743, site accessed May 27, 2013; T-Mobile “Pipes” Apple iPhone 5 Commercial, available at <http://www.youtube.com/watch?v=h2Scc6fGz9o>, site accessed May 27, 2013.

¹¹ As the Division acknowledges, such differences are potentially relevant primarily in rural areas. See *DOJ Submission* at 12-13: “when a carrier is attempting to augment the capacity of its network in dense urban areas, for example, higher-frequency spectrum may be just as effective as low-frequency spectrum.”

¹² The T-Mobile letter similarly asserts that the Commission and the Division “have confirmed [that] spectrum below 1 GHz is uniquely valuable for mobile broadband networks” (*T-Mobile Letter* at 2), and the letter quotes AT&T executives describing the “especially valuable nature of [low-frequency] spectrum” (*T-Mobile Letter* at 3). As explained below, T-Mobile confuses a technical point (the propagation characteristics of low-frequency spectrum) with the relevant economic question: whether low-frequency spectrum is competitively essential.

¹³ *DOJ Submission* at 14.

7. Again, as we have demonstrated in our previous submissions, the Division’s speculation is belied by the facts.¹⁴ A necessary condition for input foreclosure to occur is that there be no readily available substitute for the input in question; otherwise, rivals will turn to those substitutes and defeat any attempted foreclosure. Here, a ready substitute for low-frequency spectrum exists in the form of high-frequency spectrum coupled with sufficient investment in network facilities. The fact that the associated build-out costs in rural areas are higher for high-frequency spectrum does not establish that low-frequency spectrum rights are essential. The appropriate focus of a foreclosure analysis is the *full cost* of entry or expansion, which here is the combined cost of spectrum and network facilities needed to obtain coverage and capacity.¹⁵ The Division offers no evidence regarding the total cost of entering or expanding using high- versus low-frequency spectrum. In fact, the ability of carriers to substitute between low- and high-frequency spectrum will tend to equate the total cost of expansion across these two modes.¹⁶ A fundamental lesson of economics is that market forces generally will equate the costs of

¹⁴ See *Israel and Katz Reply Declaration*, ¶¶ 22-26; *Katz-Israel-Haile-Lerner Reply Declaration*, ¶¶ 10-12.

¹⁵ T-Mobile argues that “[c]arriers need lower-frequency spectrum in urban areas because it penetrates buildings better than higher-frequency spectrum.” (*T-Mobile Letter* at 4.) However, to the extent that this is an advantage of low-frequency spectrum in urban areas, the same argument applies regarding equilibrium license prices, because it is our understanding that poor building penetration can be—and, in practice, is—offset with other technologies such as in-building distributed antenna systems, femtocells, and Wi-Fi offload.

¹⁶ T-Mobile also argues that the propagation characteristics of low-frequency spectrum “cannot be effectively replicated at higher bands even if carriers are willing to make the additional investments required to deploy and operate systems in those bands” because there are “substantial, if not insurmountable, delays, and other tangible and intangible costs associated with obtaining additional siting approvals from multiple jurisdictions that licensees in lower bands can avoid.” (*T-Mobile Letter* at 4.) But T-Mobile (as well as Sprint) already has a nationwide network of cell towers utilizing high-frequency spectrum, limiting such concerns for T-Mobile and Sprint. We also note that the Commission has established rules, recently affirmed by the United States Supreme Court, that limit delays in local governments’ processing of applications for cell site construction. (*City of Arlington, Texas, et al. v. Federal Communications Commission*, 569 U.S. ____ (2013).)

substitutes. Here, this means that prices of different types of spectrum will adjust to equate the total costs of providing equivalent service (*i.e.*, the rights for spectrum requiring greater facilities investment will tend to sell for less than rights to spectrum requiring less facilities investment). The equalization of total costs renders the possibility of foreclosure through hoarding low-frequency spectrum alone remote at best. And, in any event, a foreclosure strategy seems particularly far-fetched in rural areas given the lack of spectrum scarcity in those areas.¹⁷

8. The Division also offers no evidence to support its assertion that lack of access to low-frequency spectrum has hindered the ability of Sprint and T-Mobile to compete.¹⁸ In fact, Sprint and T-Mobile both have built competitive nationwide networks relying almost entirely on high-frequency spectrum, and they have consistently decided not to acquire low-frequency spectrum at auctions or in the secondary market. Indeed, T-Mobile has publicly contradicted the Division's assertion that low-frequency spectrum is an essential input by stating that high-frequency spectrum is "as effective, or preferred to, lower band spectrum in providing competitive services."¹⁹ Thus, the Division's conclusion that incumbents can foreclose rival carriers by preventing them from obtaining low-frequency spectrum is unsupported by the evidence and contrary to basic economic principles.

9. The Division's final recommendation is to establish rigid spectrum aggregation limits, such as auction-specific spectrum caps. The Division argues that rigid rules are preferable to

¹⁷ *Israel and Katz Initial Declaration*, ¶¶ 96-98; *Israel and Katz Reply Declaration*, ¶¶ 8-11.

¹⁸ *DOJ Submission* at 14.

¹⁹ Letter from T-Mobile USA to Secretary Dortch, *Ex Parte, The State of Mobile Wireless Competition*, WT Docket 10-133 (Dec. 2, 2010) at 2.

case-by-case review because they provide certainty to auction participants.²⁰ In doing so, the Division ignores the fact that no simple rule can account for all factors that may be important in conducting a public-interest assessment of a proposed transaction. As discussed in our prior submissions, sound public policy balances certainty with the ability to reach the appropriate regulatory decisions based on full review of the relevant facts.²¹ This goal is achieved with a combination of a safe harbor and clear guidelines for evaluation of transactions outside of the safe harbor.²² Firms can then choose when to bid for spectrum above the safe harbor knowing that the acquisition may be reviewed, but assessing the regulatory risk based on the specific circumstances.²³

10. The Division also argues that rigid *ex ante* aggregation rules are needed to avoid delaying regulatory approvals or straining the agencies' resources.²⁴ Both arguments are red herrings. There is no need for especially quick resolution regarding acquisitions in the 600 MHz auction: Because of the need to clear the spectrum of broadcast television operations and develop new mobile wireless standards and equipment, there will be a period of several years during which regulatory review could take place without delaying ultimate market deployment. And, contrary to the Division's claim that unrestricted auctions would require "case-by-case review of every

²⁰ *DOJ Submission* at 21-23.

²¹ *Israel and Katz Initial Declaration*, ¶¶ 48-56; *Katz-Israel-Haile-Lerner Reply Declaration*, ¶¶ 13, 21.

²² This recommendation closely follows the Division's own standard approach to evaluation of mergers, and the Division offers no rationale for abandoning this type of approach here.

²³ We note that the firms most likely to face uncertainty about whether their acquisitions will be approved—AT&T and Verizon Wireless—are not the ones asking for additional certainty.

²⁴ *DOJ Submission* at 21-22.

acquisition,” only those transactions involving spectrum acquisitions above the safe harbor would have to be reviewed.

11. If implemented, the Division’s proposed policies would: inhibit the allocation of spectrum to its highest-value uses; make expansion more costly for the service providers that best meet consumer needs, thus raising the prices faced by consumers and undermining innovation incentives;²⁵ and substantially reduce revenue in the 600 MHz forward auction.²⁶ The last of these effects is of special concern in the incentive auctions due to the role of forward auction revenue in determining how much spectrum can be reallocated from broadcast television to mobile wireless uses.

12. In sum, the Division fails to engage with the extensive factual record and economic analysis already submitted in these proceedings and instead recommends regulatory intervention based on unsupported suppositions. Economic analysis and marketplace facts already in the record demonstrate that the Division’s recommendation that the Commission use rigid aggregation rules based on inapposite distinctions between different frequencies to restrict the ability of AT&T and Verizon Wireless to compete for spectrum in the upcoming 600 MHz auction would distort competition, harm consumers, and risk undermining the upcoming incentive auctions.

²⁵ The Division focuses on economies of scale (*DOJ Submission* at 15). However, even if—counterfactually—there were no economies of scale, denying AT&T and Verizon Wireless access to additional spectrum would raise their marginal costs, which would weaken them as competitors and harm consumers.

²⁶ *Israel and Katz Initial Declaration*, ¶¶ 20-25; *Katz-Israel-Haile-Lerner Reply Declaration*, ¶¶ 3 and 7.

I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink, appearing to read "Michael L. Katz", written over a horizontal line.

Michael L. Katz

June 13, 2013

I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink, appearing to read "Philip A. Haile" followed by a small mark.

Phil Haile

June 13, 2013

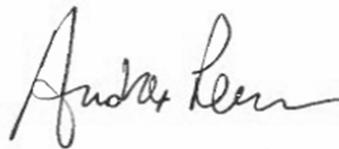
I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink, appearing to read "Mark Israel".

Mark Israel

June 13, 2013

I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink, appearing to read "Andres Lerner".

Andres Lerner

June 13, 2013

**COMMENTS ON APPROPRIATE SPECTRUM AGGREGATION POLICY
WITH APPLICATION TO THE UPCOMING 600 MHZ AUCTION**

Supplemental Reply Declaration of

**Michael L. Katz, Philip A. Haile,
Mark A. Israel, and Andres V. Lerner**

Policies Regarding Mobile Spectrum Holdings, WT Docket No. 12-269

JUNE 13, 2013

CONTENTS

I.	INTRODUCTION.....	1
II.	THERE IS NO SOUND BASIS TO CONCLUDE THAT RESTRICTING AUCTION PARTICIPATION WILL INCREASE AUCTION REVENUES.....	5
	A. ARGUMENTS THAT LIMITING AUCTION PARTICIPATION WOULD INCREASE REVENUES IN THE UPCOMING 600 MHz AUCTION HAVE NO FACTUAL BASIS	5
	B. PROFESSOR BAKER’S ARGUMENT THAT RIGID AUCTION CAPS WOULD INCREASE REVENUES BY REDUCING UNCERTAINTY HAS NO BASIS IN FACT.....	16
III.	THERE IS NO SOUND BASIS TO CONCLUDE THAT RIGID SPECTRUM CAPS WOULD PROMOTE COMPETITION AND CONSUMER WELFARE.....	16
	A. HARMS TO COMPETITION AND CONSUMER WELFARE IMPOSED BY RIGID CAPS WILL OUTWEIGH ANY PLAUSIBLE BENEFITS FROM REDUCING THE ALREADY-LOW RISK OF FORECLOSURE.....	17
	B. SPECTRUM SCREENS WITH A SAFE HARBOR WILL BETTER PROTECT COMPETITION AND CONSUMER WELFARE THAN WOULD RIGID CAPS	20
IV.	THERE IS NO VALID JUSTIFICATION FOR SPECIAL TREATMENT OF LOW-FREQUENCY SPECTRUM IN SPECTRUM AGGREGATION POLICY.....	28
	A. LACK OF FORECLOSURE RISK IN RURAL AREAS IMPLIES THAT LOW-FREQUENCY SPECTRUM SHOULD NOT BE TREATED DIFFERENTLY	29
	B. THE ABILITY TO OFFSET PROPAGATION LIMITS OF HIGH-FREQUENCY SPECTRUM THROUGH THE USE OF ADDITIONAL CELL SITES IMPLIES THAT LOW-FREQUENCY SPECTRUM SHOULD NOT BE TREATED DIFFERENTLY	30
	C. PROFESSOR BAKER’S ARGUMENTS ABOUT “TARGETED ENTRY” STRATEGIES DO NOT ALTER THE CONCLUSION THAT LOW-FREQUENCY SPECTRUM SHOULD NOT BE GIVEN SPECIAL TREATMENT	35
V.	CONCLUSION	37

I. INTRODUCTION

1. In various combinations, we have submitted declarations in the present proceeding regarding mobile spectrum holdings¹ and the related proceeding on the upcoming 600 MHz auctions.² Since the filing of our most recent report, several parties have submitted additional comments. We have been asked by counsel for AT&T to assess from the perspective of economic analysis the recent submissions of: Jonathan Baker;³ Stanley M. Besen, Serge X. Moresi, and Steven C. Salop (hereinafter, *BMS*);⁴ and Jon M. Peha.⁵ In this supplemental reply declaration, we summarize the areas of agreement among us and the other experts and then discuss areas of disagreement.

2. There appear to be several important areas of agreement, including:

- The goal of spectrum aggregation policy, in general, and as applied to the upcoming 600 MHz auction, in particular, is to promote undistorted competition and not to protect or enrich any one competitor at the expense of others;⁶

¹ Policies Regarding Mobile Spectrum Holdings, WT Docket No. 12-269.

² Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268.

³ Jonathan Baker, Spectrum Auction Rules that Foster Mobile Wireless Competition, March 12, 2013 (hereinafter, *Baker Declaration*), Attachment to Reply Comments of T-Mobile USA, GN Docket No. 12-268.

⁴ Stanley M. Besen, Serge X. Moresi, and Steven C. Salop, Why Restricting Participation in Spectrum Auctions Can Increase Bidder Participation, Increase Auction Revenues, and Increase Competition in Wireless Markets, March 12, 2013 (hereinafter, *BMS Report*), Attachment to Reply Comments of Sprint Nextel Corporation, GN Docket No. 12-268.

⁵ Jon M. Peha, Bringing Weight to the Spectrum Screen: A Response to AT&T, March 31, 2013 (hereinafter, *Peha Reply Comments*), *In the Matter of Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269.

⁶ See, e.g., *Peha Reply Comments* at 3 (“One point of agreement is that the goal of a spectrum screen is to protect future competition. Competition motivates carriers to decrease prices, increase quality of service, and innovate. The policy goal should not be to protect the interests of

- The proper standard for assessing proposals to limit spectrum aggregation is whether the proposed regulation is necessary to prevent foreclosure in downstream wireless markets by firms possessing market power;⁷
- As a general matter, increased bidder participation in auctions increases the revenue generated from such auctions, which in the specific case of the 600 MHz auctions may increase the quantity of spectrum reallocated from broadcast television to mobile wireless services.⁸

Taken together, these points imply that marketplace competition should be allowed to proceed unencumbered wherever possible, with regulatory intervention—particularly intervention that restricts auction participation—justified only where there is a substantial and credible risk of foreclosure in downstream wireless services markets.

3. Another point of agreement relates to the technical aspects of different spectrum frequency bands—in particular, that in urban and other areas where there is substantial, concentrated demand for mobile wireless services, the size of cells is generally driven by capacity needs, not coverage, and thus high- and low-frequency spectrum are effectively equivalent in terms of network buildout costs.⁹ Therefore, high- and low-frequency spectrum are

any particular carrier or carriers.”). See also, *Baker Declaration* at 4, where Professor Baker refers to a goal of limiting or preventing “competitive distortions.”

⁷ See, e.g., *Peha Reply Comments* at 3; *Baker Declaration* at 3.

⁸ See, e.g., *BMS Report* at 2, 3, and 10-11; *Baker Declaration* at 11.

⁹ See *Peha Reply Comments* at 4-5. Professor Reed and Dr. Tripathi have noted that the propagation “advantages” of low-frequency spectrum can actually prove to be a disadvantage in areas where capacity needs require smaller cells because sites equipped with low-frequency spectrum are more likely to interfere with each other. (Jeffrey H. Reed and Nishith Tripathi, *The 600 MHz Spectrum Auction: An Analysis of the Band Plan Framework and Response to Certain Proposals*, attached as Exhibit A to Reply Comments of AT&T Inc., *In the Matter of Expanding*

economically equivalent in their ability to relieve spectrum scarcity in urban and other high-demand areas, which are the areas in which spectrum scarcity may be a serious concern.

4. There are also several areas of significant disagreement. In the remainder of this declaration, we focus on three areas:

- Whether, despite the general proposition that increasing auction participation increases auction revenue, there is a basis to conclude that restricting AT&T's and Verizon Wireless's participation in the upcoming 600 MHz auction would be likely to increase auction revenue.
- Whether imposing a rigid cap on *purchases made at auction*—with or without a system of case-by-case review for secondary-market spectrum transactions—would promote or harm competition and consumer welfare.
- Whether propagation advantages of low-frequency spectrum in rural areas justify special treatment of low-frequency spectrum in spectrum screens or caps.

5. Having considered the arguments and factual evidence presented in the new submissions identified above—in addition to our review of the relevant facts and economic theories in the record for this matter generally—we continue to reach all of the findings summarized in our earlier filings. Specifically, we affirm our earlier conclusions that:

the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268.) The Commission itself has recognized that high-frequency spectrum can work as well or better than low-frequency spectrum in densely populated areas. (*In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, WT Docket No. 10-133, Fifteenth Report, rel. June 27, 2011, ¶ 296.)

- There is no sound basis for concluding that restricting participation by AT&T and/or Verizon Wireless would raise auction revenues. Rather, by restricting participation of bidders likely to be among those with the highest valuations for many licenses, such policies can be expected to lower auction revenues. (Section II.)
- The harms to competition and consumers created by rigid spectrum caps would greatly outweigh any benefits of reducing the already-low risk of foreclosure. By raising the costs of those firms most successful at offering products and services that consumers desire to consume, a rigid cap on license purchases made at auction would harm competition and consumers, whether or not it was coupled with a system of case-by-case review for secondary-market spectrum transactions. And, for many reasons, including the number of rivals competing in U.S. wireless markets, the fact that rivals have been able to compete successfully with a small fraction of the available spectrum, the large and growing amount of spectrum that would need to be acquired to implement a foreclosure strategy (much of which from rivals that are using or plan to use that spectrum as part of their own mobile wireless offerings), the small percentage of total available spectrum available in the upcoming 600 MHz auction, and the availability of alternatives to spectrum acquisition for capacity and coverage expansion (*e.g.*, cell splitting), it is implausible that an unrestricted auction that awards licenses to the highest bidders could result in foreclosure. In any event, a safe harbor coupled with *ex post* divestitures and other remedies (where necessary) would satisfy all of the policy goals stated by proponents of hard caps without harming competition and consumer welfare the way hard caps would. (Section III.)

- There is no sound economic basis for differential treatment of spectrum in different frequency bands allocated to mobile wireless services. Although buildout costs in rural areas may be higher for high-frequency than low-frequency spectrum, such cost differences will generally be reflected in different prices for spectrum, so that the total cost of expansion using different spectrum bands (which is the relevant quantity for assessing competitive effects) will tend to be equalized. (Section IV.)

II. THERE IS NO SOUND BASIS TO CONCLUDE THAT RESTRICTING AUCTION PARTICIPATION WILL INCREASE AUCTION REVENUES

6. We first examine claims that excluding AT&T and Verizon Wireless, two firms that are likely to value spectrum licenses highly in many markets, would increase expected auction revenues. We conclude that these claims are unsupported and are inconsistent with the facts of this marketplace. Rather, the likely effect of excluding high-valuation bidders from the auction is a reduction in revenue, likely leading to an inefficient reduction in the quantity of spectrum reallocated from broadcast television to mobile wireless services as well.

A. ARGUMENTS THAT LIMITING AUCTION PARTICIPATION WOULD INCREASE REVENUES IN THE UPCOMING 600 MHz AUCTION HAVE NO FACTUAL BASIS

7. As noted above, there is broad agreement among economists that increased auction participation generally increases auction revenues. Consequently, proposals to restrict auction participation, particularly of firms likely to place high values on the spectrum being auctioned, should be treated with skepticism. The need for skepticism is especially acute when these exclusionary proposals are advocated by firms, such as Sprint Nextel (Sprint) or T-Mobile USA (T-Mobile), seeking restraints on their actual and potential competitors in both mobile wireless

service markets and spectrum license auctions. There is a significant risk that these firms are attempting to use regulatory exclusion to weaken competition.¹⁰

8. In support of arguments that restricting auction participation can increase auction revenues, Professor Baker and *BMS* point to a *theoretical possibility* raised in the economics literature. However, a theoretical possibility alone is not a sound basis for drastic regulatory intervention, and neither Professor Baker nor *BMS* offer evidence that this theoretical possibility is likely to arise in the 600 MHz spectrum auctions. The theoretical possibility on which Professor Baker and *BMS* base their conclusions requires particular combinations of conditions. Absent satisfaction of these conditions, basic economic theory indicates that restricting auction participation, particularly by firms having high valuations for the licenses being auctioned, is likely to decrease auction revenues.

9. Professor Baker and *BMS* claim that the conditions underlying the theory that restricting auction participation can increase auction revenues are likely to hold for the following reasons. First, Professor Baker and *BMS* assert that it is common knowledge that AT&T and Verizon Wireless will outbid rivals at auction because a large component of these two firms' willingness to pay would be "foreclosure value."¹¹ Second, Professor Baker and *BMS* simply assume that auction participation is so costly that other bidders will be discouraged and choose not to participate. Even if these conditions were satisfied, they would not imply that restricting

¹⁰ Unlike the foreclosure alleged by Professor Baker and *BMS*, the costs to the beneficiaries of regulatory exclusion would be low (*i.e.*, there would be no need to obtain large quantities of spectrum in order to benefit). The principal costs of this exclusion through regulation would be borne by taxpayers (due to lower auction revenues), current broadcast television licensees (due to suppression of forward auction bids that would enable licensees to sell in the reverse auction), and consumers (due to higher prices for mobile wireless services).

¹¹ *Baker Declaration* at 10; *BMS Report* at 4-6 and 11.

participation would increase revenue.¹² And as we have explained previously and will now discuss further, neither their assertion nor their assumption is applicable to the upcoming 600 MHz auction.¹³

10. We address first the claim that AT&T and Verizon Wireless will outbid rivals at auction because of a so-called “foreclosure value.” As we have discussed in previous filings, foreclosure is highly unlikely, particularly in the context of the spectrum that will become available in upcoming 600 MHz auction. Foreclosure based on spectrum aggregation is particularly implausible because a large amount of suitable spectrum already has been allocated to mobile wireless services.¹⁴ Most of this spectrum that a firm would need to obtain to foreclose rivals is already in the hands of existing rivals that operate successful wireless networks. These rivals

¹² In particular, even if these conditions were satisfied, the fact that there are *multiple* high value bidders means that participation restrictions could still lower revenues, as competition between the high-value bidders can result in higher prices than competition between other potential bidders when participation by the high-value bidders is restricted. For example, assume that there are two high-value bidders (*e.g.*, AT&T and Verizon Wireless), two mid-value bidders (*e.g.*, Sprint and T-Mobile), and several low-value bidders. Professor Baker and *BMS* argue that, if there are no participation restrictions, the mid- and low-value bidders will drop out of the auction. Spectrum license prices therefore will be driven by competition between the high-value bidders. If participation by the high-value bidders is restricted, however, prices will be driven largely by competition among the mid- and low-value bidders. And there is no economic basis on which to conclude that competition between the mid- and low- value bidders will lead to higher auction prices than will competition between the high-value bidders. What’s more, following the logic put forward by Professor Baker and *BMS*, the low-value bidders may not participate to the extent that they expect to be outbid by the mid-value bidders, in which case prices will be driven by competition between the two mid-value bidders. In such a scenario, prices likely will be lower because of the participation restrictions.

¹³ See Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, Spectrum Aggregation Policy, Spectrum-Holdings-Based Bidding, and Unlicensed Spectrum, March 12, 2013 (hereinafter *Katz-Israel-Haile-Lerner Reply Declaration*), Exhibit B to Reply Comments of AT&T Inc., GN Docket No. 12-268, ¶¶ 31-34.

¹⁴ As the Commission recently recognized, more than 600 MHz of suitable spectrum has already been allocated to mobile wireless services. See Federal Communications Commission Wireless Telecommunications Bureau, Office of Engineering & Technology, *The Mobile Broadband Spectrum Challenge: International Comparisons*, February 26, 2013, Table 1.

include Sprint/Clearwire, which has the largest spectrum holdings of any carrier, and T-Mobile, which recently acquired substantial amounts of spectrum in transactions with AT&T and Verizon Wireless, as well as through its merger with MetroPCS.¹⁵ Both Sprint and T-Mobile offer unlimited service plans, which suggests that spectrum shortages are not a significant concern for them. In fact, a recent T-Mobile advertisement claims that its network is far less congested than that of another carrier, widely understood to be AT&T, which further suggests that T-Mobile has enough spectrum to meet its capacity requirements.¹⁶ In addition, Dish Network, which also has a significant amount of spectrum rights, is likely to build its own wireless service or sell its spectrum rights to other wireless providers.¹⁷

11. Numerous other providers are competing successfully and maintaining substantial market shares in many markets with a small fraction of the available spectrum.¹⁸ When competitors

¹⁵ For discussion of the spectrum acquired from AT&T and Verizon, see *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, WT Docket No. 10-133, Fifteenth Report, rel. March 21, 2013, ¶ 96. For more on the spectrum that T-Mobile acquired as part of the Metro PCS acquisition, see *Los Angeles Times*, May 1, 2013, “Combined T-Mobile-Metro PCS debuts on N.Y. Stock Exchange as ‘TMUS’,” available at <http://articles.latimes.com/2013/may/01/business/la-fi-tn-tmobile-metropcs-acquisition-complete-20130501>, site visited June 3, 2012.

¹⁶ See, e.g., PhoneArena.com, “T-Mobile ad attacks AT&T for having slow pipes,” available at http://www.phonearena.com/news/T-Mobile-ad-attacks-AT-T-for-having-slow-pipes_id42743, site accessed May 27, 2013; T-Mobile “Pipes” Apple iPhone 5 Commercial, available at <http://www.youtube.com/watch?v=h2Scc6fGz9o>, site accessed May 27, 2013.

¹⁷ See, e.g., Forbes.com, “What’s Dish Network’s Wireless Spectrum End Game?” available at <http://www.forbes.com/sites/greatspeculations/2013/04/12/whats-dish-networks-wireless-spectrum-end-game/>, site accessed June 6, 2013.

¹⁸ As we have shown in earlier filings, empirical evidence demonstrates that firms can succeed with relatively small spectrum holdings. For instance, Metro PCS has achieved at least ten-percent market share in 17 CMAs where it has 20 MHz or less spectrum; Leap has achieved at least ten-percent share in 14 CMAs where it has 20 MHz or less of spectrum, and in three of those CMAs Leap’s estimated market share exceeds 20 percent; US Cellular’s market share in some CMAs exceeds 50 percent despite spectrum holdings of less than 50 MHz. More generally, there is a

need only a small share of the available spectrum to be viable, it is more difficult for an incumbent firm to pursue a successful foreclosure strategy based on spectrum purchases because the firm would have to purchase licenses for all the spectrum rights that the entrant might require to provide its services.¹⁹

12. Thus, a foreclosure strategy would require a firm to purchase an enormous amount of spectrum from various actual and potential rivals. Any firm interested in pursuing a foreclosure strategy also would have to obtain additional spectrum that will be made available in the future, including 65 MHz of spectrum the Commission is obligated to assign through competitive bidding by February 2015.²⁰ Given the prices seen in previous spectrum auctions (with total winning bids in the tens of billions of dollars in some auctions), the costs associated with maintaining a foreclosure strategy in the face of the amount of spectrum already in the hands of rivals and ongoing spectrum releases would be enormous.²¹

low correlation between a wireless carrier's share of available spectrum and its market share in downstream mobile wireless service markets. This low correlation indicates that carriers have successfully competed with very different spectrum shares—a high spectrum share is no guarantee of a high market share, while a low spectrum share need not be an obstacle to attaining a high market share. (See Mark A. Israel and Michael L. Katz, Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings, November 28, 2012 (hereinafter, *Israel and Katz Initial Declaration*), Attachment A to Comments of AT&T Inc., *In the Matter of Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, ¶¶ 61-62; Mark A. Israel and Michael L. Katz, Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings (Reply Declaration), January 7, 2013 (hereinafter, *Israel and Katz Reply Declaration*), Attachment B to Reply Comments of AT&T Inc., WT Docket No. 12-269, ¶¶ 17-18.)

¹⁹ See *Israel and Katz Initial Declaration*, ¶¶ 26-29; *Katz-Israel-Haile-Lerner Reply Declaration*, ¶ 9.

²⁰ See Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96 at § 6401(b). The specific frequencies to be made available are the frequencies between 1915-1920 MHz, 1995-2000 MHz, 2155-2180 MHz, as well as 15 MHz between 1675-1710 MHz, and 15 MHz of contiguous spectrum to be identified by the Commission.

²¹ See *Israel and Katz Initial Declaration*, ¶ 30; *Katz-Israel-Haile-Lerner Reply Declaration*, ¶ 9.

13. Foreclosure through spectrum acquisitions is even less likely to be a rational strategy because, although the costs of foreclosure would be incurred by the foreclosing firm, the *benefits* of a foreclosing strategy would accrue to all non-foreclosed firms in the marketplace, making it unlikely that foreclosure would be profitable. Moreover, in contrast to theoretical models in which a single monopolist forecloses rivals, any benefits of foreclosure would be diminished because of competition between AT&T, Verizon Wireless, Sprint (a particularly unlikely foreclosure victim given its large spectrum holdings), T-Mobile, and other firms that remain in the marketplace.²²

14. In any event, the existing safe harbor coupled with case-by-case review of spectrum aggregation would ensure that there was no possibility of successful foreclosure even if market conditions arose that gave rise to a non-trivial risk of foreclosure absent regulatory oversight.

15. Next, consider whether T-Mobile, Sprint, and other smaller bidders would be easily deterred from participating in the upcoming 600 MHz spectrum auction. Because many licenses in many different regions will be auctioned at the same time, as long as a prospective bidder thinks it has enough chance to win one or more licenses, the value of bidding for those licenses very likely outweighs the costs of auction participation. Given the large number of licenses being auctioned, the high value placed on newly-available spectrum, and the implausibility of a claim that AT&T and Verizon Wireless are known to have the highest *marginal values* for *all* the licenses being auctioned, the idea that firms will be deterred from participating in the auction is far-fetched.

²² See *Israel and Katz Initial Declaration*, ¶ 31.

16. As we have noted previously, bidder participation is especially likely under the proposed clock auction design with generic licenses and anonymous bids. These features greatly simplify bidding and eliminate many opportunities for strategic bid manipulation that existed in the Simultaneous Multi-Round auction design used in the Commission’s prior spectrum auctions.²³ And once a provider is in the auction, the provider is free to bid on licenses everywhere. The claim that potential participants will sit out of the auction is particularly implausible with regard to Sprint and T-Mobile, two very large, well-financed companies that have announced a strong interest in obtaining spectrum in the 600 MHz auction.

17. Indeed, experience demonstrates that smaller bidders have not been deterred from participating in spectrum auctions. For example, in the 2008 auction of 700 MHz spectrum (Auction 73):²⁴

Small players were not crowded out of the market... In fact, 28 percent of the spectrum was sold to companies that collectively represented less than 10 percent of the subscribers in the market at the time... .

Similarly, T-Mobile and cable companies were among the most successful bidders for AWS spectrum in Auction 66, winning far more licenses than either AT&T or Verizon Wireless.²⁵

18. In sum, the claim by Professor Baker and *BMS* that potential auction participants anticipate that AT&T and Verizon Wireless will outbid others because of the value of foreclosure is unsupported by the factual evidence.

²³ *Katz-Israel-Haile-Lerner Reply Declaration*, ¶ 33.

²⁴ Anna-Maria Kovacs, “The merits of open and competitive spectrum auctions,” *Fierce Wireless*, March 13, 2012, available at <http://www.fiercewireless.com/story/merits-open-and-competitive-spectrum-auctions/2012-03-13>, site visited February 24, 2013.

²⁵ See, e.g., GigaOM, September 18, 2006, “AWS Over, Finally,” available at <http://gigaom.com/2006/09/18/aws-over/>, site visited June 3, 2013.

19. *BMS* cite several academic articles as supporting the claim that restricting auction participation could increase revenues.²⁶ However, on closer review, these articles do not support the positions taken by *BMS*. One is an article by Susan Athey, Dominic Coey, and Jonathan Levin, who analyze timber auctions.²⁷ *BMS* claim that *Athey et al.* show that “properly designed spectrum auctions, including those featuring targeted limitations on participation, can have a positive effect on overall participation and revenue.”²⁸ This is not an accurate characterization of *Athey et al.*’s findings. Although, *Athey et al.* recognize the existence of theoretical models indicating that restricting participation can increase auction revenues under some conditions,²⁹ these authors conclude from their own empirical study that “restricting entry [into the auctions] substantially *reduces* efficiency and revenue...”³⁰ Thus, the empirical analysis by *Athey et al.* does not support the conclusions of *BMS*, and instead supports what we have argued previously—that auction participation restrictions are likely to reduce revenues and lead to efficiency losses as well.

20. *BMS* also cite an article by auction expert Paul Klemperer for the proposition that restricting auction participation could increase revenues.³¹ However, *BMS* mischaracterize the conclusions and recommendations of the Klemperer article. The article covers various issues related to auction design, including the potential for collusion among bidders, predation or

²⁶ *BMS Report* at 3-4.

²⁷ Susan Athey, Dominic Coey and Jonathan Levin (2013) “Set-Asides and Subsidies in Auctions,” *American Economic Journal: Microeconomics* **5**: 1-27 (hereinafter, *Athey et al.*).

²⁸ *BMS Report* at 3.

²⁹ *Athey et al.* at 2.

³⁰ *Athey et al.* at 1 (emphasis added). See also *Id.* at 2 and 23.

³¹ *BMS Report* at 4-5, citing Paul Klemperer (2002a) “What Really Matters in Auction Design,” *The Journal of Economic Perspectives*, **16**: 169-189 (hereinafter, *Klemperer (2002a)*) at 172.

threats against competitors, the “winner’s curse,” and a standard tradeoff in auction design between efficiency and revenues. Klemperer does point out the theoretical possibility that weak bidders may be discouraged from participating when doing so is costly and strong bidders are certain to win.³² But Klemperer does not claim that restricting participation, particularly by high-value bidders, is likely to increase auction revenues. Neither does he recommend that limitations on the participation of bidders be imposed in order to attempt to increase auction revenues. Furthermore, nothing in the Klemperer article supports the premise that restricting participation by high-value bidders is likely to increase revenues in an auction with the characteristics of the upcoming 600 MHz auction.

21. *BMS* cite another article by Klemperer in support of their assertion that “[t]he evidence available from past spectrum auctions concretely demonstrates the benefits that bidding restrictions can have on the number of bidders, the revenues generated by the auction, and the number of competitors in the downstream market for wireless services.”³³ However, the evidence cited does not support the proposition that limitations on auction participation increase revenues. First, the analysis is based on a few anecdotes from isolated auctions across different countries, sometimes using very different types of auction designs. The available data are very limited, and the assertion that experience “concretely demonstrates” the benefits of bidding restrictions in the present context cannot be taken seriously given the small number of observations and the fact that many factors vary significantly across different auction events. Moreover, the European auctions discussed by Klemperer are not comparable to the upcoming

³² *Klemperer (2002a)* at 173-174.

³³ *BMS Report* at 6, citing Paul Klemperer (2002b) “How (Not) to Run Auctions: the European 3G Telecom Auctions,” *European Economic Review*, **46**: 829-845 (hereinafter, *Klemperer (2002b)*) at 832.

600 MHz auction, and the examples themselves do not show that restricting the participation of incumbents increases auction revenues. For instance:

- *BMS* cite Klemperer’s discussion of the 2000 UK spectrum auction, in which he observes that “the fact that at least one license had to go to a new entrant was a sufficient carrot to attract new entrants.”³⁴ The fact that the reservation of some licenses for new entrants attracted new entrants is not surprising, but this fact says nothing about the effect of such set-asides on auction revenues.
- *BMS* also cite Klemperer’s discussion of a Dutch spectrum auction, claiming this as a case in which the presence of powerful incumbents deterred entrants from participating in the auction.³⁵ In fact, Klemperer highlights a *restriction* in that auction—under which bidders were allowed to win only one license each—as a reason why the auction generated much less revenue than expected.³⁶ Moreover, Klemperer notes that “Netherlands antitrust policy was as dysfunctional as the auction design, allowing the strongest potential entrants to make deals with incumbent operators.”³⁷ The lax antitrust enforcement—a condition which surely would not apply to the upcoming 600 MHz auction in the U.S.—combined with restrictions on bidders winning more than one license each, resulted in very low auction revenues.³⁸

³⁴ *BMS Report* at 6, citing *Klemperer (2002b)* at 832.

³⁵ *BMS Report* at 6, citing *Klemperer (2002b)* at 832-833.

³⁶ *Klemperer (2002b)* at 832-833, *Klemperer (2002a)* at 176.

³⁷ *Klemperer (2002b)* at 832-833, *Klemperer (2002a)* at 185. See also, *id.* at 176.

³⁸ *Klemperer (2002a)* at 176 and 185.

- *BMS* explain that in a more recent auction OfCom (the UK counterpart of the Commission) imposed spectrum caps and set aside licenses for smaller firms.³⁹ But *BMS* do not discuss the effect of these auction restrictions on revenues. In fact, that auction has been completed and is viewed by many as a failure: It has generated less than two-thirds of the revenue predicted based on outcomes in other countries and is now the subject of a National Audit Office inquiry.⁴⁰ Although this is only a single observation from a different country, the U.K. experience may nonetheless provide the most useful insight on the likely revenue effects of imposing caps in the upcoming 600 MHz auction in the U.S.

22. *BMS* also refer to a paper by one of us noting that “[t]here are theoretical situations in which the introduction of additional bidders to an auction can lower the expected value of the winning bid.”⁴¹ As we have recognized in this and prior submissions, there is no controversy that it is *theoretically* possible for participation restrictions to raise auction revenues. The critical point is that the conditions necessary for this phenomenon to arise are not present in the upcoming 600 MHz auction. Indeed, the paper cited by *BMS* noted the lack “of any evidence that these conditions apply to the spectrum auctions under consideration.”⁴²

³⁹ *BMS Report* at 7.

⁴⁰ *The Guardian*, “Blow for George Osborne as 4G auction comes up £1.2bn short of expectations,” available at <http://www.guardian.co.uk/business/2013/feb/20/4g-auction-smartphones-george-osborne>, site visited May 27, 2013; *The Guardian*, “4G auction to be investigated by audit office after poor return,” available at <http://www.guardian.co.uk/technology/2013/apr/14/4g-auction-national-audit-office>, site visited May 27, 2013.

⁴¹ Michael Katz, “An Economic Analysis of Auction Set-Asides,” May 2012, available at http://www.gcbpp.org/files/Academic_Papers/AP_Katz_AuctionSet.pdf, site visited May 22, 2013, footnote 18, as quoted in *BMS Report* at 3.

⁴² *BMS Report* at 4.

B. PROFESSOR BAKER’S ARGUMENT THAT RIGID AUCTION CAPS WOULD INCREASE REVENUES BY REDUCING UNCERTAINTY HAS NO BASIS IN FACT

23. Professor Baker asserts that rigid caps on auction purchases also can increase auction revenues by reducing the regulatory uncertainty faced by bidders with large spectrum holdings.⁴³ The central claim of his argument is that, under rigid caps, such bidders will face no regulatory uncertainty regarding divestitures or other remedies if they are below the cap. He argues that, if such bidders otherwise faced regulatory uncertainty, they would lower their willingness to bid because they would take into account the potential loss of benefits due to—and the potential cost of—remedies.⁴⁴

24. Rather than supporting the imposition of a rigid spectrum cap, Professor Baker’s argument emphasizes the need for a well-defined safe harbor as part of an overall system of case-by-case review. As long as a firm is under the safe harbor, it can bid freely without uncertainty that it will be required to divest the acquired spectrum. Hence, the benefits that Professor Baker ascribes to a rigid cap would be achieved by a safe harbor. However, a safe harbor is not equivalent to a rigid cap. Under a safe harbor, a firm would have the option to bid for spectrum rights that would carry it over the safe harbor threshold, which would generate additional auction revenue, as well as efficiency benefits.

III. THERE IS NO SOUND BASIS TO CONCLUDE THAT RIGID SPECTRUM CAPS WOULD PROMOTE COMPETITION AND CONSUMER WELFARE

25. We next consider the arguments that rigid spectrum caps would protect competition in mobile wireless services markets and promote consumer welfare.

⁴³ *Baker Declaration* at 11.

⁴⁴ *Baker Declaration* at 11.

A. HARMS TO COMPETITION AND CONSUMER WELFARE IMPOSED BY RIGID CAPS WILL OUTWEIGH ANY PLAUSIBLE BENEFITS FROM REDUCING THE ALREADY-LOW RISK OF FORECLOSURE

26. In our previous filings, we explained that the risk of foreclosure via spectrum aggregation is very low, while the harms from caps on spectrum aggregation are severe and, thus, rigid spectrum caps would harm consumer welfare.⁴⁵

27. *BMS* argue that although there are several wireless operators that compete in the marketplace, “[b]ecause Verizon Wireless and AT&T dominate most markets, wireless competition would be increased if one of the smaller firms won the license (or licenses) instead.”⁴⁶ However, *BMS* offer no basis for their assertion that allocating more 600 MHz spectrum to one or more smaller carriers would make these markets more competitive. Reducing market concentration is *not* equivalent to protecting competition. In fact, reducing concentration through inefficient policies designed to help smaller firms, such as arbitrary spectrum allocations, can harm competition and consumers by making expansion more costly for successful firms that best meet consumer needs, limiting the realization of economies of scale, and strengthening certain competitors rather than (and likely at the expense of) strengthening competition. And, over the longer term, the incentive to innovate to become a successful firm is undermined when regulators announce *ex ante* that the company would be limited in how many customers it can obtain.⁴⁷

⁴⁵ See *Israel and Katz Initial Declaration*, ¶¶ 26-32, 49-50; *Katz-Israel-Haile-Lerner Reply Declaration*, ¶¶ 7-9.

⁴⁶ *BMS Report* at 8.

⁴⁷ See *Israel and Katz Initial Declaration*, ¶¶ 20-25.

28. Professor Baker asserts that such harms are minimal, arguing that foreclosure of rivals limits “the competitive constraint they will impose on the large incumbents, and thus the extent to which any benefits of increased scale to large incumbents are passed on to consumers in the form of lower prices, higher quality service, or new service offerings.”⁴⁸ This argument is incorrect, both in its premise and conclusions. As we discuss above, there is no support for the premise that there is a significant risk that rivals will be foreclosed. And, even if one accepts the false premise, Professor Baker’s assertion that limited competition implies limited harm from blocked access to spectrum is directly contradicted by well-established principles of economics.⁴⁹ First, cost reductions are benefits to society as a whole. Second, even if one focuses solely on the welfare of consumers, it is well established that some of the benefits of lower costs would be passed through to consumers. Professor Baker’s assertion that, absent competition from smaller firms, the degree of pass-through will be small runs counter to standard microeconomics. When a firm’s marginal costs fall, its profit-maximizing price falls as well: Indeed, even a monopolist has incentives to lower its prices in response to marginal cost savings.⁵⁰ In fact, it is well established that less-competitive markets can have higher rates of pass-through than more-

⁴⁸ *Baker Declaration* at 4.

⁴⁹ We interpret Professor Baker’s phrase to “any benefits of increased scale to large incumbents” as referring to the marginal and average cost reductions that result when these firms optimize their input mixes and utilize additional amounts of spectrum rights to produce mobile wireless services. If, instead, Professor Baker is referring narrowly to pure economies of scale, he is committing a major error of omission: Even if—hypothetically—there were no economies of scale, denying large incumbents the ability to optimize their input mixes would raise their marginal costs, which would weaken them as competitors and harm consumers.

⁵⁰ One way to see this point is to note that claiming a monopolist would not find it profitable to charge lower prices when its marginal costs are lower would be equivalent to claiming that the monopolist would not find it profitable to charge higher prices when its marginal costs are higher.

competitive markets, directly contrary to Professor Baker's implicit claim.⁵¹ The fact that pass-through occurs under a wide range of market conditions implies that there will be harm to consumers if large incumbents' costs are driven up by auction-participation restrictions.

29. Professor Baker also argues that a "long term perspective" justifies the use of spectrum caps because large incumbents with substantial spectrum holdings may "frustrate the development of new technologies and business models brought to market by smaller rivals and potential competitors (including future rivals that cannot now be identified), thereby preventing or delaying the development of new competition."⁵² Given the importance of innovation and investment to consumer welfare in mobile wireless service markets, we agree that a long-term perspective is appropriate when formulating spectrum policy. But Professor Baker draws the wrong conclusion from this perspective. Professor Baker seeks to limit the expansion of firms that have successfully innovated and brought to market products and services that are popular with consumers. Imposing a success tax (*i.e.*, by setting caps that deny spectrum to firms that have attracted large numbers of subscribers and thus driving up their costs of doing business) is likely to harm incentives to invest and innovate.

30. Moreover, Professor Baker's claim is inconsistent with technological advances to date. As we have noted previously, there has been rapid and pervasive technological progress within all layers of the mobile wireless ecosystem, including network technology and services, network

⁵¹ For more discussion of these phenomena, including the fact that a monopolist will pass through cost changes and that, the amount of pass through has no monotonic relationship with the degree of competition see, *e.g.*, Jeremy I. Bulow and Paul Pfleiderer (1983) "A Note on the Effect of Cost Changes on Prices," *Journal of Political Economy*, **6**: 58-73.

⁵² *Baker Declaration* at 5.

management, handsets, mobile access device operating systems, and applications.⁵³ Professor Baker ignores the fact that AT&T and Verizon Wireless have been leaders in bringing innovations to mobile wireless services markets.

B. SPECTRUM SCREENS WITH A SAFE HARBOR WILL BETTER PROTECT COMPETITION AND CONSUMER WELFARE THAN WOULD RIGID CAPS

31. As we have argued previously, spectrum screens, coupled with *ex post* review, will better protect competition and promote consumer welfare than will rigid caps.⁵⁴ To the extent that analysis of the outcome of a particular auction reveals that a successful bidder's spectrum holdings would be excessive in a particular geographic area, a remedy (such as divestiture) can be applied after the auction has closed.⁵⁵ The Commission can rely on the experience that it and the other competition agencies have developed in implementing appropriate divestitures, both in spectrum-related transactions and otherwise.

32. Professor Baker and *BMS* make several points in support of the claim that rigid caps at auction are more efficient than an *ex post* case-by-case review of transactions and potential divestitures. These points are seriously flawed.

33. **First**, Professor Baker claims that rigid caps can facilitate planning and reduce uncertainty without any costs from misallocating spectrum because it is “unlikely” that the Commission would reach different decisions through case-by-case review than would be

⁵³ See Michael L. Katz, “Public Policy Principles for Promoting Efficient Wireless Innovation and Investment,” Attachment to Comments of AT&T, Inc., *Fostering Innovation and Investment in the Wireless Communications Market; A National Broadband Plan For Our Future*, GN Docket Nos. 09-157, 09-51, September 30, 2009.

⁵⁴ See *Israel and Katz Initial Declaration*, ¶¶ 54-56.

⁵⁵ See *Katz-Israel-Haile-Lerner Reply Declaration*, ¶ 21.

imposed by a rigid cap.⁵⁶ If the Commission could anticipate every contingency upfront and pre-determine the decision it would make in every possible case-by-case review, then there would be some merit to arguments regarding the benefits of rigid caps. However, for several reasons, it is implausible that an *ex ante* spectrum cap would lead to the same conclusion in substantially all cases as would be reached by the Commission in an *ex post*, case-by-case review:

- A case-by-case, *ex post* review can take into account individual market conditions and buyer-specific factors that cannot be achieved through the use of an *ex ante* cap. Competitive conditions and other factors vary widely from market to market, and an *ex ante* cap cannot anticipate every contingency and predict every decision the Commission would make on a case-by-case basis. Professor Baker may have in mind that the Commission could take into account all these market-specific factors in setting caps, but the set of possible auction outcomes is enormous, and the notion that the Commission should spend the resources required to evaluate every possible outcome upfront is unreasonable. It is infeasible for an upfront cap to consider all possible outcomes in sufficient detail to specify every decision. Arguing for an *ex ante* cap that replicates the decisions that would be made in *ex post* review is much like asking the Department of Justice to issue precise *ex ante* rules for which mergers will or will not be approved, rather than broad guidelines.

⁵⁶ *Baker Declaration* at 9 (“the Commission would be expected to apply similar principles to case-by-case reviews that it would in determining the initial spectrum cap...”). See also *Baker Declaration* at 13 (“a case-by-case review could not practically avoid applying general guidelines for preventing undue spectrum concentration, and those guidelines are unlikely to differ markedly from those that would be specified in developing a spectrum cap.”).

- Spectrum caps and other *ex-ante* rules would need to be established through lengthy proceedings such as this one, well in advance of auction completion. To the extent that conditions change before the completion of the auction—as is likely in a rapidly changing industry—these changes could be considered in *ex post* review but not in *ex ante* rules.
- To enable firms to optimize their spectrum holdings while protecting competition, firms should be allowed to divest any of their spectrum holdings if post-auction divestitures are deemed necessary, not just those acquired in the auction, so long as the regulator deems the divestiture sufficient to protect competition. Hence, firms should be allowed to purchase spectrum that pushes their holdings above “acceptable” levels and then to divest other spectrum after the auction to address this situation. It is not clear how this could be implemented via an *ex ante* cap.

34. Notably, Professor Baker agrees that “[i]f the Commission would frequently reach a different and better outcome through post-auction case-by-case reviews compared to the outcomes it would reach by specifying a spectrum cap as part of its auction rule, then a case-by-case approach would warrant closer consideration.”⁵⁷ Hence, Professor Baker’s disagreement with our position appears to come down largely to our view that careful *ex post* review is likely to reach a more accurate decision than *ex ante* caps. Our view is consistent with the practice of other agencies responsible for reviewing mergers (*e.g.*, the Department of Justice and the Federal Trade Commission) as well as that of the Commission itself. Because the examination of concentration is only the starting point in assessing market power and competitive effects, a full

⁵⁷ *Baker Declaration* at 13.

merger review often reaches a different conclusion than would a simple screen based solely on concentration.⁵⁸ Moreover, even when a full analysis suggests a possible competitive issue, the reviewing agencies often adopt remedies short of blocking the transaction outright in order to attain the benefits of the merger without harming competition.

35. Given the likelihood that *ex post* review of spectrum transactions will lead to different conclusions than would be reached by a rigid cap, Professor Baker's proposal that a rigid cap apply only to auctions, with case-by-case review of secondary-market transactions, is particularly misguided.⁵⁹ As we have explained, applying one set of rules to auctions and another to secondary markets creates arbitrage opportunities.⁶⁰ Economic forces generally lead to assets being held by the users who value them most. If the highest-value user of a particular spectrum license were prevented from acquiring the license in an initial spectrum license auction, it should be expected to eventually acquire the license (or at least the ability to make use of the associated spectrum rights) from the auction winner through a later, secondary-market transaction. Thus, attempts to regulate primary auctions in isolation will very likely be undone by secondary-market transactions.⁶¹ Indeed, experience proves the point.⁶² Hence, in the end, if

⁵⁸ See U.S. Department of Justice & Federal Trade Commission, Horizontal Merger Guidelines (2010), available at <http://www.justice.gov/atr/public/guidelines/hmg-2010.pdf>, site visited May 22, 2013, at 7 and 16-19.

⁵⁹ *Baker Declaration* at 7.

⁶⁰ *Katz-Israel-Haile-Lerner Reply Declaration*, ¶ 22.

⁶¹ Professor Baker mischaracterizes our argument by implying that the argument depends on acquisition of spectrum by “speculative bidders, interested in spectrum only for the purpose of resale.” (*Baker Declaration* at 10.) To the contrary, our argument does not rest on any particular strategy—speculative or otherwise—being used by the firm that acquires the spectrum at auction. A buyer may go into the auction intending to acquire spectrum for use in the provision of mobile wireless services, but if the spectrum is worth more to another firm then that other firm will be able to pay the buyer enough to convince it to sell the spectrum. To assert otherwise is to deny the core economic tenet that firms maximize profits.

auction rules and secondary-market rules differ, the secondary-market rules will control and the distinct auction rules will serve largely to delay the transfer of the spectrum to the highest-value users and thus the deployment of the spectrum in the marketplace.

36. **Second**, Professor Baker argues that rigid spectrum caps are preferable to case-by-case review for auctions because they provide “clear guidance to firms bidding in auctions” which is important to “achieving efficient spectrum allocation.”⁶³ However, the objective of providing regulatory certainty can be achieved while also reaching regulatory decisions that appropriately account for the full range of circumstances by: (a) defining a safe harbor for acceptable spectrum purchases, and (b) providing a clear indication of the standards that will be used to evaluate acquisitions outside of the safe harbor. With that information, firms can choose when to bid for spectrum above the safe harbor, knowing that the acquisition may be reviewed, but assessing the regulatory risk based on the specific circumstances. We note that the firms most likely to face uncertainty about whether their spectrum acquisitions will be approved—AT&T and Verizon Wireless—are not the ones asking for additional certainty.

37. **Third**, Professor Baker argues that *ex ante* auction rules and caps can avoid delay associated with regulatory review.⁶⁴ However, in the period following the 600 MHz auction, we

⁶² An analysis conducted by Verizon conservatively found that, measured on a MHz-per-POP basis, approximately two-thirds of the C- and F-block PCS licenses are held today by entities that would have been ineligible to participate in the original auctions. (Verizon analysis of data from Regular and Active, Radio Service Code: CW – PCS Broadband, Market Based License Search, available at <http://wireless2.fcc.gov/UlsApp/UlsSearch/searchMarket.jsp>, site visited May 22, 2013. The study is conservative in that it assumes that only AT&T, Sprint, T-Mobile, U.S. Cellular, and Verizon Wireless would have been ineligible to bid.)

⁶³ *Baker Declaration* at 8.

⁶⁴ *Baker Declaration* at 8-9 (“Auction rules also avoid the cost and time involved with regulatory reviews after the auction has taken place, as well as any additional distortions associated with prolonging the uncertainty about how spectrum would be allocated.”)

understand that there will be years before deployment of new spectrum can occur, as the spectrum is cleared of broadcast operations and mobile wireless standards and equipment for the spectrum are developed. This lag permits any necessary regulatory review without delaying ultimate market deployment. Moreover, for the reasons described above, Professor Baker's proposal to have different rules for auctions and secondary-market transactions effectively guarantees lags as spectrum finds its way to the highest-value user. The use of a spectrum screen with a safe harbor also can avoid regulatory delays for spectrum purchases below the safe harbor. And, for purchases above the safe harbor, the question is whether case-by-case review of those transactions would be more costly and time-consuming than secondary-market transactions following an auction with rigid caps, which, under Professor Baker's proposal, also would have to go through regulatory review. There is no basis on which to conclude that the secondary-market process and regulatory approval of secondary-market transactions would be more efficient than regulatory review of auction outcomes that exceed safe-harbor guidelines. In fact, the opposite is very likely to be true.

38. **Fourth**, Professor Baker argues that case-by-case review would lead to a "time-inconsistency" problem if the Commission "might consider [distortions created by an unrestricted auction] as 'sunk' and approve an acquisition that it would have earlier considered to be anti-competitive."⁶⁵ According to Professor Baker, "[f]irms that foresee this possibility could take advantage of the Commission's time-inconsistency by bidding for spectrum that they would be prohibited from acquiring by a spectrum cap, knowing that their anticompetitive purchases

⁶⁵ *Baker Declaration* at 13.

will be too costly to reverse.”⁶⁶ This argument is contradicted by experience. Both the Commission and the Antitrust Division have demonstrated the ability and willingness to require firms to divest acquired assets, including spectrum. Moreover, the costs of such divestitures are borne primarily by the divesting parties. Of course, this last point does not mean that such costs are irrelevant. Instead, the costs associated with undoing auction acquisitions are another reason why the Commission should be judicious about which acquisitions it reviews and overturns.

39. **Fifth**, Professor Baker argues that divestitures will be inefficient because, if firms are allowed to choose what spectrum to divest, they will choose the spectrum that minimizes the competitive threat they face.⁶⁷ *BMS* make a similar point and also claim that “absent strong intervention by the regulator, a firm that is required to divest assets is likely to price them above their market value or engage in negotiating tactics that delay access to the spectrum by its competitors.”⁶⁸ The obvious response is that regulators can, in fact, engage in strong intervention if and when it is necessary. The Commission and the Antitrust Division have extensive experience ensuring timely and appropriate divestitures.

40. **Sixth**, *BMS* argue that divestitures will be inefficient because it will be too difficult to account for the effects on valuations driven by interdependencies among a firm’s spectrum holdings.⁶⁹ However, this same difficulty would arise under Professor Baker’s proposed

⁶⁶ *Baker Declaration* at 13.

⁶⁷ *Baker Declaration* at 8 (“if the firm required to divest spectrum is permitted to choose which bands to divest or select the new owner, it would be able to make those choices in ways that reduce potential competition to itself, further enhancing the inefficiency of the resulting spectrum allocation.”).

⁶⁸ *BMS Report* at 9.

⁶⁹ *BMS* recognize these challenges, but reach an incorrect conclusion from these facts. See *BMS Report* at 9-10 (asserting that because “the value of any spectrum license to its holder depends importantly on its other spectrum holdings ... remedying the anticompetitive effects of excessive

approach consisting of rigid caps at auction and regulatory review of secondary transactions. A rigid cap may restrict spectrum acquisitions that would increase consumer welfare and present no credible threat of foreclosure, and the highest-value user of a particular spectrum license would be expected eventually to acquire the license from the auction winner through secondary-market transactions. But those secondary-market transactions also would have to account for the “interdependencies” in spectrum values discussed by *BMS*, and the secondary market may perform more poorly than auctions, especially given the significant effort that the Commission has put into designing auctions to take into account these interdependencies.⁷⁰ Moreover, there is no reason that the spectrum that most efficiently solves the competitive concern need be the same spectrum acquired in the auction. Hence, by allowing *ex-post* divestitures of any spectrum that addresses the Commission’s concern, attention can be paid to meeting the dual goals of preventing any credible risk of foreclosure while allowing firms to optimize spectrum holdings to account for the “interdependencies” in spectrum values discussed by *BMS*.

41. **Finally**, Professor Baker claims that divestitures would lead to “a different outcome than would have been obtained had the disqualified firm been prevented from bidding in the first place by a spectrum cap,” apparently implying that the outcome based on a divestiture will be less efficient than what would have been obtained with a rigid cap.⁷¹ Professor Baker contends that post-auction transactions in a secondary market cannot undo entirely the outcomes of the

spectrum holdings *after* an auction is unlikely to be a good substitute for taking them into account *during* the auction.”).

⁷⁰ *BMS Report* at 9 (“Commission has organized its spectrum auctions in a way that takes into account these interdependencies. If it were easy for these interdependencies to be taken into account after an auction, there would be no need to design the auction in a way that allows bidders to take these synergies into account during the auction.”).

⁷¹ *Baker Declaration* at 8.

auction because firms will “make commitments to business plans” that alter their post-auction decisions. Yet, Professor Baker directly contradicts this point later in his declaration when he claims that, if the Commission imposes restrictions on aggregation of low-frequency spectrum that are unnecessary, then these restrictions can always be undone via purchases of high-frequency spectrum (in secondary-markets) “to compensate.”⁷² More generally, to the extent that Professor Baker is correct that secondary-market transactions cannot perfectly replicate the outcome that would have occurred under auctions with different rules, this fact also provides a reason why auction caps can be *harmful*, as, by this logic, inappropriate auction restrictions cannot fully be undone in secondary-markets. Given that any auction rules—whether caps or post-auction divestitures—will have long-term effects that may not be fully reversible (even if the rule is later determined to be improper), Professor Baker’s argument really supports two recommendations: (i) the need for finely-tuned rulings that are carefully crafted to the specifics of a given competitive situation, such as can be accomplished with ex-post review, and (ii) the need for *ex ante* transparency on the standards for review of all spectrum transactions, including the use a spectrum screen and a clear safe harbor.⁷³

IV. THERE IS NO VALID JUSTIFICATION FOR SPECIAL TREATMENT OF LOW-FREQUENCY SPECTRUM IN SPECTRUM AGGREGATION POLICY

42. Our previous declarations have explained in detail why proposals to treat low-frequency spectrum (specifically, spectrum below 1 GHz) differently in evaluating spectrum aggregation—

⁷² *Baker Declaration* at 18-19.

⁷³ Moreover, Professor Baker’s assertion is largely based on a concern that the firms that did not win the spectrum in the first place would, by the time of divestitures, have found “work-arounds” and thus would not bid for the divested spectrum in the secondary market. (*Baker Declaration* at 12.) But if such work-arounds are possible, then the spectrum acquisition did not lead to foreclosure in the first place, as the “victim” firms found other ways to compete that obviated the need even to bid for the spectrum. No divestiture would be appropriate in such a case.

either by putting more weight on such spectrum in forming a screen or cap, or forming separate screens or caps for such spectrum—are ill advised. In particular, we have explained why the technological observation that, in order to provide equivalent coverage, high-frequency spectrum may require buildout of more cell sites than low-frequency spectrum does not demonstrate that low-frequency spectrum should receive differential treatment in spectrum aggregation policy.⁷⁴ Rather, spectrum aggregation policy should aim to prevent foreclosure and thus should focus on the full cost of entry or expansion for an entrant or smaller rival (including the combined cost of spectrum and associated buildout), not the value of spectrum held by an incumbent. A spectrum cap based on value-weighting firms' spectrum holdings—or defined based on a firm's holdings of low-frequency spectrum alone—is inherently misguided because it fails to capture the full cost of entry or expansion for an entrant or smaller firm. Even if a firm holds extensive low-frequency spectrum, high-frequency spectrum sold at a lower price (to reflect the greater buildout costs) can facilitate entry, and a screen targeted at low-frequency spectrum in particular cannot capture this fact.

43. Unfortunately, recent submissions continue to misunderstand these basic economic principles. We seek to clarify the key points in this section.

A. LACK OF FORECLOSURE RISK IN RURAL AREAS IMPLIES THAT LOW-FREQUENCY SPECTRUM SHOULD NOT BE TREATED DIFFERENTLY

44. We start with an issue about which there seems to be agreement—that any relevant differences in the functionality of low- and high-frequency spectrum apply primarily in rural

⁷⁴ See *Israel and Katz Reply Declaration*, ¶¶ 8-34, 44-54; *Katz-Israel-Haile-Lerner Reply Declaration*, ¶¶ 10-12.

areas.⁷⁵ As we understand it, the number and size of cells in urban areas are generally driven by capacity needs—with many more (and smaller) cells than would be required solely to provide coverage—so that either low- or high-frequency spectrum can serve a geographic area with roughly the same number of cells. In contrast, in rural areas, because of differences in propagation characteristics, a high-frequency network may require more cell sites to provide the same coverage as a low-frequency network and, thus, a high-frequency network can have higher facilities buildout costs.

45. As noted above, there is also agreement that the focus of spectrum aggregation policy should be on preventing foreclosure. Yet we are unaware of any credible claims that spectrum scarcity limits competition in rural areas, let alone credible claims of spectrum-based foreclosure in rural areas. To the contrary, most of the discussion regarding mobile wireless service in rural areas is not about firms that wish to compete being kept out, but rather pertains to the need to encourage more firms to enter given the difficulties in achieving sufficient scale to serve such areas in a cost-effective way. In other words, there are no areas in which foreclosure is a relevant concern and differences in low- and high-frequency spectrum propagation are relevant.

B. THE ABILITY TO OFFSET PROPAGATION LIMITS OF HIGH-FREQUENCY SPECTRUM THROUGH THE USE OF ADDITIONAL CELL SITES IMPLIES THAT LOW-FREQUENCY SPECTRUM SHOULD NOT BE TREATED DIFFERENTLY

46. Given the proper focus on foreclosure, a spectrum aggregation policy focused on aggregation of low-frequency spectrum in particular would be justifiable only if high-frequency

⁷⁵ See *Peña Reply Comments* at 4-5. Professor Baker also argues that low-frequency spectrum has “superior in-building penetration,” which is important in urban areas. (*Baker Declaration* at 14.) However, to the extent that this is an advantage of low-frequency spectrum in urban areas, the arguments developed in this paper regarding equilibrium license prices also apply, because it is our understanding that poor building penetration can be (and is in practice) offset with other technologies such as in-building distributed antenna systems, femtocells, and Wi-Fi offload

spectrum were ineffective for entry/expansion, so that an incumbent could disadvantage rivals by holding most or all of the available low-frequency spectrum and forcing other firms to rely on high-frequency spectrum. A careful review of the relevant facts and theory, however, indicates that high-frequency spectrum is likely no worse for entry than low-frequency spectrum, once the full costs of spectrum and buildout are accounted for.

47. Low-frequency spectrum and high-frequency spectrum can accomplish the same coverage, with more cells required for high-frequency spectrum (in areas where network design is driven by coverage, rather than capacity, considerations). This fact pushes the total cost of entry/expansion using either high- or low-frequency spectrum to equalize—if not, demand would shift to the type of spectrum that permitted less costly entry/expansion, pushing its price up. Notably, this conclusion does not depend on an assumption of perfectly competitive markets or any particular market structure; it applies whatever the nature of competitive interaction in the marketplace and depends only on the fundamental economic tenet that the arbitrage possibilities cannot persist.

48. When low- and high-frequency spectrum can be used as part of entry or expansion strategies that are substantially equivalent when viewed in total, Professor Peha's claim that equal weighting across frequency bands is arbitrary is incorrect.⁷⁶ Indeed, the appropriateness of equal weighting follows directly from the logic Professor Peha attempts to apply to support the use of value- or cost-based weights in spectrum caps. His mistake is to focus on the cost of one input, rather than the entire package. The latter, not the former, is what is meaningful in assessing the risk of foreclosure and harm to competition. When total costs are used, the equal-

⁷⁶ *Peha Reply Comments* at 8.

cost logic (properly applied) implies that a system with equal weights (or what many people call an “unweighted” system) is appropriate.

49. Professor Peha argues that “[t]o treat 20 MHz of spectrum in the 700 MHz band the same as 20 MHz of spectrum in the AWS band because they have a number in common is as arbitrary as treating 100 U.S. dollars the same as 100 Hong Kong dollars.”⁷⁷ Professor Peha fails to develop his analogy fully enough. Suppose one person started with 100 Euros and converted it to a bundle in which 75 percent of the value was in U.S. dollars and 25 percent in Hong Kong dollars. Suppose another person took 100 Euros and converted it to a mix in which 25 percent of the value was in U.S. dollars and 75 in percent Hong Kong dollars. It would make no sense to claim that, because a U.S. dollar is worth more than a Hong Kong dollar, the first person is better off because she holds more U.S. dollars than does the second person.⁷⁸ Both consumers have spent 100 Euros and still have 100 Euros worth of buying power. Similarly, if two firms are able to purchase networks of equal capacity at the same price, but one spends more on spectrum and less on network facilities than the other, then the different input mixes are competitively irrelevant.

50. Professor Peha also attempts to refute this economic logic using two straw-man arguments. In one of these, Professor Peha discusses a hypothetical scenario regarding farms in Kansas and Nevada that grow wheat that is a substitute for oil. This example can be used to illustrate the fact that there are limits to arbitrage, but it refutes neither the fundamental economic logic we have presented nor its applicability to mobile wireless markets. If the differences in the

⁷⁷ *Peha Reply Comments* at 8-9.

⁷⁸ At recent exchange rates, one Hong Kong dollar was worth 0.13 U.S. dollar.

need for water in Kansas and Nevada were so great that a Nevada farm would be unprofitable even if it received the land for free, then Kansas and Nevada farmland would not be meaningful substitutes. Similarly, if alternative uses of Nevada farmland resulted in land prices that made wheat farming unprofitable, then Kansas and Nevada farmland would not be substitutes.

However, proponents of separate spectrum caps have provided no evidence that either corresponding condition applies to licenses for high- and low-frequency spectrum. And, if the price of farmland in Nevada were driven by its value in wheat farming, so that the arbitrage condition did hold, then it would be appropriate to treat an acre in Nevada the same as an acre in Kansas for purposes of conducting a foreclosure analysis.

51. A similar flaw invalidates Professor Peha's claim that our reasoning based on the logic of arbitrage could be used to show that a 10 MHz and a 25 MHz license should be treated equally because a 10 MHz license could, in principle, be combined with a denser cell network to match the 25 MHz license.⁷⁹ As in the farmland example, the relevant question is not merely the technological feasibility of substitution (*i.e.*, not simply whether Kansas and Nevada land *could* be used to the same end or whether 10 MHz and 25 MHz licenses *could* be used to support the same service), but whether prices of the inputs are set by firms who will use the inputs to provide substantially equivalent service. Substitution of a 10MHz license for a 25 MHz license may be technologically feasible but is not an economically viable option given the associated buildout cost and the alternative uses available for the 10 MHz license (*e.g.*, combining it with other license to form a larger block of spectrum).

⁷⁹ *Peha Reply Comments* at 7.

52. Professor Peha also claims that the arbitrage condition, which implies that the price of high-frequency and low-frequency spectrum will reflect the buildout costs associated with each type of spectrum, may fail due to the market power of a single firm that “may greatly affect the market price.”⁸⁰ This claim is incorrect as a matter of economics. The arbitrage condition does not depend on the absence of market power; it depends only on the fact that, if the price of high-frequency spectrum does not equal the price of low-frequency spectrum plus an additional amount to account for extra buildout costs, then firms will divert to the type of spectrum imposing lower total buildout costs, thus driving the price of that type of spectrum up until the arbitrage condition is satisfied. Indeed, if a firm with market power wanted to foreclose entry, it would need to ensure that the prices of both types of spectrum were sufficiently high—otherwise, an entrant could simply divert to the type of spectrum with lower total buildout costs, circumventing the foreclosure strategy. The inherent problem with a claim that incumbents with market power in low-frequency spectrum can foreclose entry is that, even if such incumbents drive up the price of the low-frequency spectrum over which they allegedly have market power, they would leave the high-frequency option available for entrants.⁸¹

⁸⁰ *Peha Reply Comments* at 7.

⁸¹ Professor Peha also argues that “it is risky to assume that a firm in such a market can obtain spectrum whenever it wishes at a reasonable equilibrium price.” (*Peha Reply Comments* at 7.) It is inconsistent with the economic concept of “equilibrium price” to argue that a firm cannot obtain spectrum at the equilibrium price. Hence, Professor Peha must have some specific notion of a “reasonable” equilibrium price in mind. Because he does not define this concept, we cannot respond, except to note that that he must have some definition in mind *other than* the price that assigns different bands of spectrum to their most efficient uses.

C. PROFESSOR BAKER’S ARGUMENTS ABOUT “TARGETED ENTRY” STRATEGIES DO NOT ALTER THE CONCLUSION THAT LOW-FREQUENCY SPECTRUM SHOULD NOT BE GIVEN SPECIAL TREATMENT

53. Professor Baker attempts to refute the economic logic presented above by arguing that high-frequency and low-frequency spectrum may be used in different ways, with owners of high-frequency spectrum potentially not building enough cell sites to match the full coverage of owners of low-frequency spectrum and, thus, engaging in more “targeted” entry.⁸² In particular, Professor Baker argues that, even if an entrant buys high-frequency spectrum at a price sufficiently below what an incumbent firm pays for low-frequency spectrum that it *could* provide equivalent service to an incumbent firm at the same total cost (summing both the cost of spectrum and the cost of buildout), the entrant may *choose* to “spend less on buildout and offer service with less coverage, more limited building penetration, or lower capacity”—thus providing so-called “targeted service.”⁸³

54. Professor Baker’s arguments provide no basis for an auction restriction based on low-frequency spectrum. Whether entrants would (or would not) *choose* to use high-frequency spectrum to pursue a competitive strategy different from that pursued by an incumbent—a theoretical possibility for which Professor Baker provides no evidence—is not the appropriate question in assessing the risk of foreclosure. The choice by an entrant to use assets that are capable of replicating an incumbent’s competitive strategy at the same cost instead to pursue an alternative competitive strategy is clearly *not* an example of foreclosure of access to inputs

⁸² *Baker Declaration* at 16-18.

⁸³ *Baker Declaration* at 17.

needed to provide competitive service. Rather, this is an example in which entrants choose the best competitive strategy available to them given the marketplace characteristics.^{84, 85}

55. In any event, there is no economic or empirical basis to conclude that rivals employing targeted strategies impose insufficient competitive pressure on incumbent firms. Rather, targeted entry is likely to be an effective entry strategy of the sort that ensures that foreclosure is *not* a concern in mobile wireless service markets. This conclusion holds for several reasons:

- As noted above, in urban areas, cell sizes are likely determined by capacity considerations and high- and low-frequency spectrum are thus equivalent.⁸⁶ Hence, any distinctions between high-frequency and low-frequency spectrum apply primarily to rural areas, where the marketplace can likely support only a smaller number of firms.

⁸⁴ Professor Baker argues that one reason for the choice not to pursue full buildout with high frequency spectrum might be longer buildout time when using high-frequency spectrum. (*Baker Declaration*, footnote 28.) Of course, such buildout time is not an issue where firms (such as T-Mobile or Sprint) already have extensive networks and should not be an issue for the upcoming 600 MHz spectrum auction in any case, as we understand substantial time is required before the spectrum will be ready for use. Professor Baker also argues in this footnote that it may become more difficult over time for firms to build or acquire new cells, but provides no support for such difficulties in rural areas where the difference between low- and high-frequency spectrum is relevant and provides no reason to believe any such difficulties would not be factored into the upfront price of the spectrum, pushing the cost of high-frequency spectrum down further.

⁸⁵ If, for some reason, the Commission wanted to restrict this competitive process in order to force new entrants to pursue strategies identical to those pursued by incumbents, it would not need to further restrict competition by placing regulatory caps on the acquisition of certain types of spectrum. Instead, the Commission could impose buildout requirements on the purchase of high-frequency spectrum that would prevent strategies based on “targeted service.” We *do not* recommend such requirements, as they restrict the competitive process. Rather, we simply note that, if the concern is about “targeted service” rather than full buildout, then this concern can be addressed via buildout requirements. A targeted buildout policy would have fewer adverse, unintended consequences for competition and consumer welfare than would restrictions on acquisition of particular types of spectrum.

⁸⁶ One might argue that for new entrants, traffic in urban areas may be relatively sparse at least initially. But it seems unlikely that credible entry strategies that put real competitive pressure on incumbent providers in urban areas can be predicated on a view that traffic will remain sparse over time.

- To the extent that additional entry is possible in portions of rural areas, targeted entry is likely precisely what is required, as it provides competition in those portions of rural areas with enough demand to support competition from additional mobile wireless service providers. If it is true that the use of high-frequency spectrum facilitates targeted entry, then it likely spurs competition.
- In those areas that entrants serve with high-frequency spectrum, the use of many cell sites to provide coverage also results in a firm's having substantial capacity because a denser network can engage in greater frequency reuse. Consequently, the marginal cost of adding additional usage/subscribers is likely to be lower for a service provider utilizing high-frequency spectrum: Given the cell towers needed for coverage, incremental traffic within a covered area more likely can be carried without requiring capacity expansion. This fact directly contradicts Professor Baker's claim that high-frequency spectrum is likely to have higher marginal cost associated with adding capacity.⁸⁷
- In sum, entrants utilizing high-frequency spectrum are likely to target areas that support additional firms and to make good use of their spectrum holdings in terms of capacity to expand, exactly as one would want for an effective entry strategy.

V. CONCLUSION

56. We affirm our conclusion that imposing spectrum caps—either overall caps or caps that apply to low-frequency spectrum and/or auctions in particular—would harm competition and consumer welfare. From the perspective of protecting competition and promoting consumer welfare, a far better policy is to apply a clear safe harbor, based on overall spectrum holdings,

⁸⁷ *Baker Declaration*, footnote 28.

combined with case-by-case review of acquisitions beyond the safe harbor using clear principles transparently applied.

I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink that reads "Michael L. Katz". The signature is written in a cursive style and is positioned above a horizontal line.

Michael L. Katz

June 13, 2013

I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink that reads "Philip A. Haile / EB". The signature is written in a cursive style.

Phil Haile

June 13, 2013

I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink that reads "Mark A. Israel". The signature is written in a cursive style.

Mark Israel

June 13, 2013

I declare, under penalty of perjury, that the foregoing is true and correct.

A handwritten signature in black ink that reads "Andres Lerner". The signature is written in a cursive style.

Andres Lerner

June 13, 2013