PUBLIC VERSION

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

In the Matter of the Joint Application of TracFone Wireless, Inc. (U4321C), América Móvil, S.A.B. de C.V. and Verizon Communications, Inc. for Approval of Transfer of Control over Tracfone Wireless, Inc.	Application 20-11-001

OPENING TESTIMONY OF MARK A. ISRAEL

March 12, 2021

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I. INTRODUCTION

A. QUALIFICATIONS

1. My name is Mark A. Israel. I am a Senior Managing Director at Compass Lexecon, an economic consulting firm where I have worked since 2006. I run the firm's North American antitrust and competition business.

2. From 2000 to 2006, I served as a full-time member of the faculty at Kellogg School of Management, Northwestern University. I received my Ph.D. in economics from Stanford University in 2001.

3. I specialize in the economics of industrial organization—which is the study of competition in imperfectly competitive markets, including the study of antitrust and regulatory issues—as well as applied econometrics. At Kellogg and Stanford, I taught graduate-level courses covering topics including business strategy, industrial organization economics, and econometrics. My research on these topics has been published in leading peer reviewed economics journals including the *American Economic Review*, *The Rand Journal of Economics*, *Review of Industrial Organization*, *Information Economics and Policy*, and *Journal of Competition Law and Economics*.

4. My work at Compass Lexecon has focused on the application of economic theory and econometric methods to competitive analysis, issues including a wide variety of single-firm and multi-firm conduct, class certification, and damages estimation. I have analyzed these issues on behalf of a wide range of clients, including private companies and government entities. I have testified in federal courts, multiple state courts, and in many regulatory and arbitration

proceedings in the United States and around the world. I have presented my findings to the Department of Justice and the Federal Trade Commission on dozens of occasions. I have also submitted expert reports, declarations, and affidavits to government agencies and federal and state courts.

5. Further details of my qualifications are provided in my *curriculum vitae*, including a list of matters in which I have testified as an expert at trial or by deposition since 2015, which is attached as Exhibit 1 to this testimony.

6. My current billing rate is $1,375 per hour. My compensation does not depend on the outcome of this matter.

B. Assignment

7. On November 5, 2020, TracFone Wireless, Inc. (TracFone), América Móvil, S.A.B. de C.V. (América Móvil), and Verizon Communications, Inc. (Verizon), filed a joint application seeking approval to transfer control of TracFone from América Móvil to Verizon. TracFone will become a direct subsidiary of Verizon.

8. I have been asked by counsel for TracFone to assess, from an economic perspective, the likely effects of the transaction on competition for services provided by either company.

C. Summary of conclusions

9. Based on my review of materials, and my training and experience as an economist, my main conclusions are summarized as follows:

- *The transaction will result in substantial efficiencies that will benefit consumers in the United States overall and in California specifically.* Absent the transaction, TracFone must purchase wholesale network access at prices that include a substantial markup over true marginal network costs. With the merger, TracFone, as a subsidiary of Verizon, will realize these (lower) on-network marginal costs. The reduction in marginal costs will incentivize Verizon to compete more aggressively with TracFone's brand than TracFone would on its own. In addition, the transaction will reduce transaction costs associated with the current arm's-length relationship between Verizon and TracFone. This reduction in transaction costs will allow Verizon to introduce new TracFone products much more quickly and seamlessly and also allow it to provide better customer service, thus improving the overall product quality and further reducing the quality-adjusted price of TracFone's offerings.

- *The transaction will not materially reduce retail wireless competition in the United States or in California.* Verizon and TracFone are not close competitors to each another. Verizon sells wireless service primarily to premium, postpaid customers and competes with other postpaid brands from AT&T and T-Mobile. TracFone sells wireless service to value-conscious, prepaid customers and competes primarily with flanker brands from AT&T (Leap), T-Mobile (Metro), and DISH (Boost), as well as with other MVNOs. Thus, the transaction will not materially reduce competition in the sale of wireless plans to consumers, but rather will strengthen competition, particularly among the prepaid brands, due to TracFone's improved offerings, as described above.

- *The transaction will not materially reduce wholesale wireless competition in the United States or in California.* Verizon, like other mobile network operators (MNOs), sells wholesale network access to mobile virtual network operators (MVNOs) because doing so allows it to share in the surplus created by selling wireless service to customer segments that the MNOs would not otherwise target. Verizon will retain this incentive to sell wholesale network access post-merger. Indeed, both AT&T and T-Mobile continue to sell wholesale network access even though each owns a prepaid "flanker" brand that competes with TracFone. Given this lack of vertical harms, the main vertical effect of the merger will be the efficiencies captured by TracFone due to vertical integration, which will increase competition in the mobile wireless marketplace in California.

10. The remainder of this report explains these conclusions in greater depth and provides details of the facts and analyses that led me to reach them.

II. THE TRANSACTION WOULD LOWER COSTS AND BENEFIT CONSUMERS.

11. Verizon provides wireless service throughout the United States and in California. It operates an advanced wireless network, which frequently ranks highly in third-party network tests both nationwide and in California.[1] Because it operates its own network, I refer to it as a

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1 RootMetrics, US State of the Mobile Union 2H 2020, *available at* https://assets.ctfassets.net/ob7bbcsqy5m2/3DZuJBNdedml8IFxLmVsA3/06e23b03ec39f1b26cd36a242f34eb19/RootMetrics_US_2H2020_SOMU_report-final.pdf, *site accessed* March 11, 2021, p. 10 ("By far the highest award total: Verizon earned an exceptional 790 RootScore Awards out of 875 total award chances at the metro level. In fact, Verizon brought home over twice as many awards as AT&T (382) and nearly five times more than T-Mobile (146)."); 2H 2020 California State

mobile network operator (MNO). Verizon's retail wireless business focuses primarily on premium, postpaid customers—nationally, 90 million of its 94 million retail wireless subscribers (approximately 96 percent) purchase its postpaid service.[2] In California, less than [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] subscribers on Verizon's network purchase its branded prepaid service.[3] To reach prepaid subscribers, Verizon relies primarily on third-party distributors. In total, approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] MVNO customers use Verizon's network in California.[4] Of this total, [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**].[5]

12. TracFone sells wireless plans throughout the United States, but it does not operate its own network. Instead, it purchases wholesale network access from AT&T, T-Mobile, and

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RootScore Report, *available at* https://www.rootmetrics.com/en-US/rootscore/map/state/california/2020/2H, *site accessed* March 11, 2021 (Verizon ranked #1 across all metrics including Overall Performance, Network Reliability, Network Accessibility, Network Speed (tied with AT&T), Data Performance (tied with AT&T), Call Performance, and Text Performance (tied with AT&T).)

2 Verizon Communications Inc., Form 10-K for the fiscal year ended December 31, 2020, p. 30.

3 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 43.

4 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 47. Verizon computes customer counts based on lines with usage in California in December 2020.

5 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 47.

Verizon. For this reason, I refer to it as a mobile virtual network operator (MVNO). TracFone is the largest MVNO in the country, with, as of the timing of the filing of the Joint Application in this proceeding, approximately 21 million customers nationally and approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] customers in California.[6] Nationwide, approximately 64 percent of TracFone customers use Verizon's network, while T-Mobile accounts for approximately 19 percent and AT&T accounts for approximately 16 percent.[7] In California, [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] percent of TracFone customers use Verizon's network.[8]

13. Verizon and TracFone possess assets that are complementary to one another: Verizon has a large network and enjoys low marginal costs of network usage and TracFone possesses extensive skill and knowledge about marketing to prepaid and value-conscious customers. As a

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6 América Móvil, América Móvil's fourth quarter of 2020 financial and operating report, February 9, 2021, *available at* https://s22.q4cdn.com/604986553/files/doc_financials/2020/q4/4Q20.pdf, *site accessed* March 11, 2021, p. 21; Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 3.

7 *In the Matter of the Joint Application of TracFone Wireless, Inc. (U4321C), América Móvil, S.A.B. de C.V., and Verizon Communications Inc. for Approval of Transfer of Control Over TracFone Wireless, Inc.,* CPUC Application No. 20-11-001, Joint Applicants' Consolidated Reply to Protests to Joint Application for Approval Pursuant to Section 854(1) of Transfer of Control Over TracFone Wireless, Inc., December 21, 2020, pp. 11-12; *In the Matter of América Móvil, S.A.B. de C.V., Transferor, and Verizon Communications Inc., Transferee, Application for Consent to Transfer Control of TracFone Wireless, Inc. Pursuant to Section 214 of the Communications Act of 1934, as Amended*, FCC IB File No. ITC-T/C-20200930-00173, Joint Reply to Comments, December 28, 2020, note 34.

[redacted]

general matter, mergers that combine complementary assets have the potential to create substantial efficiencies that benefit consumers. As recognized in the Vertical Merger Guidelines:[9]

> Vertical mergers combine complementary economic functions and eliminate contracting frictions, and therefore have the capacity to create a range of potentially cognizable efficiencies that benefit competition and consumers.

As independent companies, Verizon and TracFone operate at arm's length and have imperfectly aligned incentives in the sense that each makes strategic decisions in consideration of its own profits and not the profits of the other party. This misalignment of incentives leads to inefficient contracts with prices that are higher than they would be if incentives were fully aligned, with any changes to those contracts requiring substantial time and transaction cost to negotiate. The transaction will bring those complementary assets under common ownership with aligned incentives, creating increased incentives to lower quality-adjusted prices and to fully utilize the assets—as the combined company (Verizon and TracFone) will fully internalize the benefit of using its assets to sell the product—which will ultimately benefit consumers through more robust competition.

14. Below, I explain how, from an economic perspective, the transaction can be expected substantially to lower TracFone's costs and benefit consumers, indicating that vertical integration between Verizon and TracFone is more efficient and consumer-welfare enhancing.

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9 U.S. Department of Justice and The Federal Trade Commission, Vertical Merger Guidelines, June 30, 2020, § 6.

A. THE TRANSACTION WOULD SUBSTANTIALLY REDUCE THE MERGED FIRM'S MARGINAL NETWORK COSTS.

15. TracFone currently purchases wholesale network access, and the transaction would allow it to instead realize costs associated with "owner's economics." In particular, today the incremental costs to TracFone from adding a customer with associated usage reflect the substantially marked-up charges from an MNO, whereas post-merger TracFone will internalize Verizon's much lower actual incremental cost of serving that additional load. Because, as a matter of economics and based on my experience in the industry, the costs associated with the latter can be expected to be markedly lower than those associated with the former,[10] the transaction will reduce TracFone's marginal costs and give it a strong incentive to compete more vigorously for consumers. For that reason, the transaction will lower TracFone's costs, an effect that makes it a more potent competitor.

16. Below, I separately consider the reduction in marginal costs associated with TracFone customers who would otherwise be on the AT&T and T-Mobile networks and TracFone customers who would otherwise be on the Verizon network.

1. Network cost efficiencies associated with TracFone customers who would otherwise be on AT&T's and T-Mobile's networks are large.

17. Nationally, TracFone has approximately 7.6 million customers on networks other than Verizon, primarily the AT&T and T-Mobile networks.[11] TracFone pays approximately [**BEGIN**

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10 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 9 ("Verizon's incremental network costs are a fraction of the price TracFone pays for wholesale service.").

11 *In the Matter of the Joint Application of TracFone Wireless, Inc. (U4321C), América Móvil, S.A.B. de C.V., and Verizon Communications Inc. for Approval of Transfer of Control Over*

CONFIDENTIAL LAWYERS ONLY] [redacted] **[END CONFIDENTIAL LAWYERS ONLY]** per GB to T-Mobile.[12] Average usage per subscriber per month is [**BEGIN CONFIDENTIAL LAWYERS ONLY]** [redacted] **[END CONFIDENTIAL LAWYERS ONLY]** GB, meaning that TracFone's marginal network costs per subscriber per month are approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY]** [redacted] **[END CONFIDENTIAL LAWYERS ONLY]**.[13] Similarly, TracFone pays approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY]** [redacted] **[END CONFIDENTIAL LAWYERS ONLY]** per GB to AT&T.[14] Average usage per subscriber per month is [**BEGIN CONFIDENTIAL LAWYERS ONLY]** [redacted] **[END CONFIDENTIAL LAWYERS ONLY]** GB, meaning that TracFone's marginal network costs per subscriber per month are approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY]** [redacted] **[END CONFIDENTIAL LAWYERS ONLY]**.[15] TracFone's ARPU is $28, meaning

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TracFone Wireless, Inc., CPUC Application No. 20-11-001, Joint Applicants' Consolidated Reply to Protests to Joint Application for Approval Pursuant to Section 854(1) of Transfer of Control Over TracFone Wireless, Inc., December 21, 2020, pp. 11-12; *In the Matter of América Móvil, S.A.B. de C.V., Transferor, and Verizon Communications Inc., Transferee, Application for Consent to Transfer Control of TracFone Wireless, Inc. Pursuant to Section 214 of the Communications Act of 1934, as Amended*, FCC IB File No. ITC-T/C-20200930-00173, Joint Reply to Comments, December 28, 2020, pp. 10-11.

12 Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 12.

13 Data provided by TracFone.

14 Data provided by TracFone.

15 Data provided by TracFone.

that network costs alone consume [**BEGIN CONFIDENTIAL LAWYERS ONLY**] a [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] of TracFone's revenues.[16]

18. In contrast, based on economics and my experience in the industry, Verizon's own marginal costs to serve additional traffic can be expected to be substantially lower: In each of the multiple cases I have studied, the marginal costs associated with operating a network have been substantially lower than the wholesale costs that MNOs charge to MVNOs. Post-merger, Verizon will internalize those lower on-network costs when setting TracFone's prices. The associated decline in TracFone's marginal costs, from the wholesale costs that it would incur but for the merger to the on-network costs that it would realize post-merger, give it a strong incentive to compete more aggressively as an integrated company than it otherwise would as a separate company. Such efficiencies make the vertically integrated firm a stronger competitor than separate firms and thus increase competition and benefit consumers.

2. Network cost efficiencies associated with TracFone customers who would otherwise be on Verizon's network are large.

19. Similar logic applies to TracFone customers currently on Verizon's network. Although TracFone's wholesale payments to Verizon represent costs from TracFone's perspective and revenues from Verizon's perspective, what matters for pricing incentives are TracFone's marginal costs. Absent the transaction, those marginal costs reflect the extra mark-up that Verizon (like AT&T and T-Mobile) puts on wholesale services sold to TracFone; post-merger,

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16 América Móvil, América Móvil's fourth quarter of 2020 financial and operating report, February 9, 2021, *available at* https://s22.q4cdn.com/604986553/files/doc_financials/2020/q4/4Q20.pdf, *site accessed* March 11, 2021, p. 21.

this extra markup is eliminated and TracFone will take into account Verizon's true incremental network costs when setting prices.

20. By "eliminating double marginalization" in this way, reducing TracFone's marginal network costs from those based on wholesale rates to Verizon's on-network marginal costs, the transaction will substantially reduce TracFone's marginal costs for those customers who would otherwise be on Verizon's network in the stand-alone case.[17] Whereas on a standalone basis, Verizon has an incentive to set wholesale prices accounting only for its own profits, post-merger, Verizon internalizes the full benefit—the difference between revenues and true marginal costs—on each incremental TracFone sale. Such elimination of double marginalization is recognized as an efficiency from vertical integration, with its significance growing with the size of the pre-merger markups.[18]

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[17] Said differently, the wholesale costs are marginal to TracFone, but not to Verizon. Below, I address the case in which TracFone diverts customers from other MVNOs using Verizon's network, which would be a marginal cost in the post-merger scenario, and I demonstrate that such costs are likely to be low.

[18] U.S. Department of Justice and The Federal Trade Commission, Vertical Merger Guidelines, June 30, 2020, p. 5 ("The elimination of double marginalization, for example, can confer on the merged firm an incentive to set lower downstream prices. The price that a downstream firm pays for an input supplied by an independent upstream firm may include a markup over the upstream firm's marginal cost. If a downstream and an upstream firm merge, and the merged firm supplies itself with its own related product, it will have access to the input at cost.").

See also U.S. Department of Justice and The Federal Trade Commission, Vertical Merger Guidelines, June 30, 2020, p. 12 ("Mergers of firms that make complementary products can lead to a pricing efficiency analogous to the elimination of double marginalization. Absent the merger, the merging parties would set the price for each complement without regard to the impact of lower prices for one on demand for the other. If the two merge, the merged firm has an incentive to set prices that maximize the profits of the firm as a whole, which may result in lower prices for each component. Any incentive to offer lower prices may be more pronounced if the merged firm can target lower prices at customers that buy both components from it."); David Reiffen and Michael Vita (1995), "Comment: Is There New Thinking on Vertical Mergers," *Antitrust Law*

21. Nationally, approximately 13.4 million TracFone customers are on the Verizon network.[19] TracFone pays approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] per GB to Verizon.[20] Average usage per subscriber per month is [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] GB, meaning that TracFone's marginal network costs per subscriber per month are approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**].[21] Because [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**]. Again, these network costs alone represent [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] of TracFone's revenue. And again, based on economics and my experience in the industry, Verizon's actual incremental costs of serving TracFone customers can be

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Journal, 63: 917-941; Phillip E. Areeda and Herbert Hovenkamp, *Antitrust Law: An Analysis of Antitrust Principles and Their Application*, 4th and 5th Editions 2013-2020, ¶ 1000a and Subchapter 10A-1 (discussing "the likelihood that a vertical merger will promote efficiencies or other procompetitive benefits, which must be regarded as even more substantial than the efficiencies flowing from horizontal mergers" and the belief that "most vertical mergers are procompetitive.").

19 *In the Matter of the Joint Application of TracFone Wireless, Inc. (U4321C), América Móvil, S.A.B. de C.V., and Verizon Communications Inc. for Approval of Transfer of Control Over TracFone Wireless, Inc.,* CPUC Application No. 20-11-001, Joint Applicants' Consolidated Reply to Protests to Joint Application for Approval Pursuant to Section 854(1) of Transfer of Control Over TracFone Wireless, Inc., December 21, 2020, pp. 11-12.

20 Data provided by TracFone.

21 Data provided by TracFone.

expected to be far below this, in which case the effect of double marginalization, which the merger removes, is substantial.

22. The marginal cost reductions resulting from the elimination of double marginalization can be expected to make TracFone a much more potent competitor post-merger. Given the minimal degree of retail competition between Verizon and TracFone, which I describe in Section III below, vertical integration is efficient and highly likely to be consumer-welfare enhancing.

3. Any potential countervailing marginal network cost disefficiencies are small, meaning overall double marginalization efficiencies are large.

23. When evaluating the change in pricing incentives, one additional effect must be evaluated (and, in the present case, largely ruled out). To the extent lower TracFone prices attract customers who would otherwise be getting network services from Verizon—meaning the customer would come from another, non-TracFone MVNO operating on Verizon's network—then the lost Verizon wholesale access revenue associated with that MVNO customer would offset the incremental profit associated with attracting that customer to TracFone. In the language of economics, in that case, the pre-merger wholesale price paid by TracFone would be replaced by the opportunity cost of reduced wholesale revenue for Verizon, thus undoing the elimination of double marginalization, and leaving effective marginal costs largely unchanged. Critically, this opportunity-cost effect arises *only* in cases where the customer attracted by TracFone comes from another MVNO using the Verizon network.

24. However, this countervailing effect is quite small, especially given the very small share held by Verizon's other prepaid MVNOs. The vast majority of diversion to TracFone is likely to come from products that do not rely on Verizon's network. In particular, Leap (AT&T), Metro

(T-Mobile), and Boost (DISH) account for approximately 75 percent of all prepaid subscribers.[22] Indeed, a desire to compete more effectively with these "flanker" brands owned by other MNOs is a main motivation for the transaction.[23] And when TracFone attracts such customers post-merger, there is no opportunity-cost effect.

25. Moreover, excluding cable operators, among MVNOs using Verizon's network in California, TracFone accounts for approximately [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] of customers.[24] Hence, given Verizon's prepaid strategy of relying on MVNOs for distribution, there simply are [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] and thus not much scope for any opportunity-cost effect.

26. [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] are cable customers such as those of Charter and Comcast, which sell postpaid wireless service primarily as part of bundled offerings along with video, wireline broadband, and voice. As a matter of economic logic and based on my experience in the industry, the fact that these cable operators appeal to customers who want to add wireless service

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22 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 43.

23 Opening Testimony of Angie Klein, Vice President, Consumer Segment Marketing, for Verizon Wireless, p. 3.

24 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 47.

to a bundle of services they already obtain from their cable company makes them quite differentiated from dedicated wireless MVNOs like TracFone. Hence, [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] are also relatively unlikely to be attracted by a more competitive TracFone offering, making it even more clear that the bulk of the substitution will come from prepaid brands carried on other MNOs, for which there is no opportunity-cost effect but rather pure double-marginalization savings.

B. THE TRANSACTION WOULD RESULT IN FASTER PRODUCT ROLL-OUTS.

27. As a matter of economics, arm's-length negotiations are difficult and slow due to imperfectly aligned incentives and thus the need to account for all uncertainties and risks with contractual terms.[25] That is, while economists often theorize that contracts can enable third-party deals to accomplish the benefits of integration, doing so requires separate negotiations for each new initiative, with complex contracts dealing with all contingencies. Such negotiations require extensive time and cost, can ultimately leave the entities unable to adapt as the market changes, and thus often prevent the parties from even trying to implement new innovations. By reducing the transaction costs associated with new product introductions, the merger can be expected to increase the speed and frequency with which TracFone can offer new products to consumers.

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[25] David Besanko, David Dranove, Mark Shanley, and Scott Schaefer, *Economics of Strategy,* 7th Ed., Wiley, Chapter 3.

28. Because TracFone purchases wholesale network access from MNOs, any significant changes to its offerings, such as the introduction of a new plan or additional services, require TracFone to negotiate modifications to its wholesale agreement with the host MNO.[26] This renegotiation process can take many months, during which TracFone cannot offer the new product or service to consumers. For example, contract negotiations [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**].[27]

29. Fully integrated rivals such as Metro and Cricket introduce new products and services much more quickly than does TracFone because they do not need to engage in such lengthy negotiations with their parent companies. For example, in response to the COVID-19 pandemic, Metro launched a new $15 per month plan on March 25, 2020—just days after schools and workplaces shut down as a result of the pandemic.[28] By contrast, [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] **[END CONFIDENTIAL LAWYERS ONLY]**

[26] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., pp. 14-15.

[27] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 15.

[28] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 15.

[29] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 16.

30. Similarly, before TracFone can offer new services and features such as WiFi calling, hotspot availability, or international roaming to its users, it must first negotiate with its MNO hosts to offer those capabilities, and then must rely on those hosts to develop the necessary technology platforms to actually implement these capabilities for TracFone users. This process can take months, which leaves TracFone at a competitive disadvantage to MNO-owned brands Cricket and Metro, which can more rapidly roll out new services and features to their users.

31. Even where contracts can be reached, arm's-length implementation often leaves the parties with limited information, which can reduce product quality. Integration with Verizon will enable TracFone to have visibility into the network that allows it to provide better customer care.[30] Specifically, direct access to carrier systems, tools, and features would allow TracFone to diagnose and remedy customer problems in near real time, thus mitigating the risk of service disruptions and customer-service issues more efficiently and effectively. In contrast, TracFone today has only indirect access to its MNO partners' networks, and necessarily cannot be as effective in addressing many customer-care issues.

32. In sum, both very well-established economic theory and many specific examples indicate that the transaction would align incentives and eliminate the need for arm's-length negotiations, thus reducing the associated transaction costs, meaning TracFone consumers will get more and better offerings faster and Tracfone will become a stronger competitor.

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[30] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 18.

C. THE TRANSACTION WOULD RESULT IN ECONOMIES OF SCALE AND SCOPE.

33. Although the marginal network cost savings described in Section II.A account for the bulk of the efficiencies and are, by themselves, sufficient to offset any potential concern about upward pricing pressure arising from the transaction, the transaction is also likely to generate non-network cost savings as a result of economies of scale and scope.

34. For example, as a leading wireless service provider, Verizon has early access to many new, innovative, and competitively priced device offerings. Verizon customers have access to a broad array of devices (many with class-leading 4G and 5G), hotspots, Jetpacks, wearables for children, 4G fixed wireless devices, and low-cost flip phones with app store capabilities. By contrast, standalone TracFone lacks the volume to negotiate with the original equipment manufacturers (OEMs) for these devices and does not have the scale necessary to do so.[31] TracFone is therefore likely to benefit from lower handset acquisition costs as a result of economies of scale in purchasing.[32] Once again, the effect is to make TracFone a more effective (lower cost and higher quality) prepaid competitor, a procompetitive change.

35. TracFone would also benefit from economies of density in distribution, which would benefit consumers through more convenient access to TracFone retail locations and lower distribution costs for Tracfone. Although TracFone has several distribution outlets, it lacks a

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[31] **[BEGIN CONFIDENTIAL LAWYERS ONLY]** [redacted] **[END CONFIDENTIAL LAWYERS ONLY]**

[32] Opening Testimony of Angie Klein, Vice President, Consumer Segment Marketing, for Verizon Wireless, p. 14.

broad network of nationwide retail stores and relies primarily on [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] to reach customers.[33] The transaction will give Verizon the incentive and flexibility to expand TracFone's distribution network.[34] Specifically, the efficiencies discussed above mean that each incremental TracFone customer will be worth more to Verizon post-merger than she is to TracFone without the transaction. This increased per-customer profitability increases the net present value of investing in TracFone distribution, thus creating enhanced incentives to make such investments. And more extensive distribution will make TracFone a stronger competitor to the extent that distribution is an important competitive tool. Overall, the lower TracFone marginal costs post-merger will incentivize TracFone to compete more aggressively for each consumer, through lower quality-adjusted prices (as described above) and through greater investments in distribution.

D. VERIZON WOULD HAVE AN INCENTIVE TO PASS THROUGH COST SAVINGS TO CONSUMERS.

36. TracFone incurs wholesale network access costs for each incremental GB of data its customers consume.[35] As it adds incremental customers, its wholesale network access costs

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[33] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 6.

[34] Opening Testimony of Angie Klein, Vice President, Consumer Segment Marketing, for Verizon Wireless, pp. 25-26.

[35] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., pp. 11-12.

increase. The network cost efficiencies described in Section II.A above will therefore reduce TracFone's marginal costs.

37. Profit-maximizing firms have an incentive to pass through marginal cost savings because doing so is profitable. This follows because, starting from pre-merger prices, a reduction in marginal costs makes every new customer attracted more profitable (the price-cost margin on the customer is higher), creating an incentive to compete harder to attract customers. Such increased incentives to sell to more customers are the essence of a procompetitive change.

III. THE TRANSACTION WOULD NOT MATERIALLY REDUCE RETAIL COMPETITION.

38. Both Verizon and TracFone sell mobile wireless services to retail consumers, with Verizon providing these services through its own facilities and TracFone doing so by purchasing wholesale network access from MNOs. In this section, I discuss the correct treatment of retail competition between MNOs and MVNOs and conclude that the transaction is unlikely materially to reduce retail wireless competition (meaning it will not result in material "horizontal" harms to competition). In the next section, I explain why any significant adverse competitive effects are unlikely and thus why, when considering the totality of effects, including efficiencies, the transaction is likely to be procompetitive and to benefit consumers.

A. Appropriate Treatment of Competition between MVNOs and MNOs

39. Although MVNOs are retail competitors of MNOs, because they depend on wholesale access to MNO networks, they are not fully independent. MNOs control the price at which they offer wholesale network access to MVNOs and the extent to which they do so.

40. As a result, traditional tools of antitrust analysis offer an incomplete picture, and must be adjusted to account for these issues. For example, the calculation of concentration measures such as the Herfindahl-Hirschman Index (HHI) requires one either to treat MVNOs as wholly controlled subsidiaries of the MNOs on which they operate, or as fully independent competitors. Neither assumption reflects the complex competitive dynamic between MNOs and MVNOs. HHIs thus provide only a rough approximation of the competitive effects of a merger of an MVNO and an MNO. A better treatment directly captures the fact that, although MVNOs compete in the retail market, they do so with marginal costs that reflect wholesale prices that are above true incremental network costs, and thus that the dominant competitive effect of vertical integration is to reduce those costs.

41. For completeness, in this section, I examine the merger's effect on shares and on retail competition. I explain why the merger is unlikely substantially to reduce competition regardless of how one treats MVNO competition. I consider the issue both attributing MVNO share to the corresponding MNO and not attributing the share in order to show this conclusion.

B. If one attributes MVNOs to MNOs, the transaction would not materially increase concentration.

42. As shown in Table 1 below, if one attributes MVNOs to the MNOs on which they operate, and considers shares among prepaid plans and MVNOs, moving TracFone's customers from AT&T's and T-Mobile's networks to Verizon's network reduces concentration. For

example, among prepaid plans and MVNOs, the HHI *decreases* by 28 to 119 points as a result of the transaction depending on the assumption one makes about how to treat DISH.[36]

Table 1: Prepaid plus Wholesale Subscriber Shares and Concentration

Sensitivity	Pre-/Post-Merger	AT&T Share	T-Mobile Share	Verizon Share	DISH Share	HHI	Delta HHI
Retail Prepaid + Wholesale, DISH is an MNO	Pre-Merger	27.1%	37.7%	25.1%	10.2%	2,885	-28
	Post-Merger	23.4%	33.2%	33.2%	10.2%	2,857	
Retail Prepaid + Wholesale, DISH is a T-Mobile MVNO	Pre-Merger	27.1%	47.9%	25.1%		3,652	-119
	Post-Merger	23.4%	43.4%	33.2%		3,534	

Sources: T-Mobile Q2 2020 10-Q, p. 68; AT&T Q2 2020 10-Q, p. 41; Verizon Q2 2020 10-Q, p. 44; T-Mobile Press Release, "T-Mobile Closes Deal with DISH to Divest Sprint Prepaid Business," July 1, 2020, *available at* https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2020/T-Mobile-Closes-Deal-with-DISH-to-Divest-Sprint-Prepaid-Business/, *site accessed* March 10, 2021; S&P Global, "U.S. Carrier Financial Metrics, 1Q 2020" ('Wholesale Subs' tab); Data provided by TracFone and Verizon.

Notes:

[1] Data as of June 2020, with the following exceptions: DISH subscribers as of July 1, 2020 press release, AT&T wholesale subscribers as of Q1 2020, and T-Mobile wholesale subscribers as of Q4 2019.

[2] Analysis assumes that all TracFone subscribers move to Verizon post-merger.

[3] MVNO shares are attributed to the MNOs from which they purchase network access.

[4] Connected devices and IoT/M2M are excluded.

[5] Analysis uses estimates of total consumer wholesale subscribers on each MNO network as a proxy for wholesale prepaid subscribers. Thus, postpaid MVNOs (e.g., Xfinity Mobile) may be included.

43. As shown in Table 2 below, if one applies the same exercise to overall shares, combining postpaid, prepaid, and MVNO subscribers, HHI increases by just 20 to 27 points, far below the "safe harbor" levels established in the Horizontal Merger Guidelines.[37]

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36 DISH currently has a wholesale agreement with T-Mobile, but is in the process of building its own network. (DISH Network Corporation, Form 10-K for the fiscal year ended December 31, 2020, p. 1 ("We are currently operating our retail wireless business unit as a mobile virtual network operator ("MVNO") while we build our 5G broadband network.").)

37 U.S. Department of Justice and The Federal Trade Commission, Horizontal Merger Guidelines, August 19, 2010, § 5.3 ("Mergers involving an increase in the HHI of less than 100 points are unlikely to have adverse competitive effects and ordinarily require no further analysis.").

Table 2: Postpaid, Prepaid, and Wholesale Subscriber Shares and Concentration

Sensitivity	Pre-/Post-Merger	AT&T Share	T-Mobile Share	Verizon Share	DISH Share	HHI	Delta HHI
Postpaid + Prepaid + Wholesale, DISH is an MNO	Pre-Merger	31.0%	31.0%	35.1%	2.9%	3,163	27
	Post-Merger	30.0%	29.7%	37.4%	2.9%	3,190	
Postpaid + Prepaid + Wholesale, DISH is a T-Mobile MVNO	Pre-Merger	31.0%	33.9%	35.1%		3,342	20
	Post-Merger	30.0%	32.6%	37.4%		3,362	

Sources: T-Mobile Q2 2020 10-Q, p. 68; AT&T Q2 2020 10-Q, p. 41; Verizon Q2 2020 10-Q, p. 44; T-Mobile Press Release, "T-Mobile Closes Deal with DISH to Divest Sprint Prepaid Business," July 1, 2020, *available at* https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2020/T-Mobile-Closes-Deal-with-DISH-to-Divest-Sprint-Prepaid-Business/, *site accessed* March 10, 2021; S&P Global, "U.S. Carrier Financial Metrics, 1Q 2020" ('Wholesale Subs' tab); Data provided by TracFone and Verizon.

Notes:

[1] Data as of June 2020, with the following exceptions: DISH subscribers as of July 1, 2020 press release, AT&T wholesale subscribers as of Q1 2020, and T-Mobile wholesale subscribers as of Q4 2019.

[2] Analysis assumes that all TracFone subscribers move to Verizon post-merger.

[3] MVNO shares are attributed to the MNOs from which they purchase network access.

[4] Connected devices and IoT/M2M are excluded.

C. IF ONE DOES NOT ATTRIBUTE MVNOS TO MNOS, VERIZON AND TRACFONE ARE SUBSTANTIALLY DIFFERENTIATED.

44. Alternatively, if one were to treat MVNOs as wholly independent competitors, by definition, the merger must increase concentration. However, to do so inappropriately ignores the relationship between MNOs and MVNOs, in which MNOs have substantial control over the ability of MVNOs to compete, as seen in part through wholesale prices that are above the incremental network costs faced by MNOs.

45. Moreover, even if one were to make this incorrect assumption, it still would not lead to the conclusion that the merger is likely to harm competition.[38] Most fundamentally, one would have to consider the enormous procompetitive efficiencies described above. Further, any potential counterbalancing harms to retail competition would be small, even treating MVNOs as independent. In particular, any theorized harm to competition would depend on strong

[38] Horizontal Merger Guidelines, § 5.3 ("Market shares may not fully reflect the competitive significance of firms in the market or the impact of a merger. They are used in conjunction with other evidence of competitive effects.").

substitution between Verizon's other offerings and TracFone. In fact, however, Verizon's and TracFone's plans and market focus are substantially differentiated from one another and each faces closer competition from other competitors than from each other, meaning that, as a matter of standard antitrust analysis, any risk of harm to retail competition is very small, even treating MVNOs as independent.

46. Verizon offers primarily high-end postpaid plans and competes primarily with similar plans offered by AT&T and T-Mobile.[39] To the limited extent it offers prepaid plans, those plans are small players (as seen in the numbers above) and tend to be "premium" or niche market plans.[40] In contrast, TracFone only offers prepaid plans and competes mostly for value-conscious customers primarily with other MVNOs and prepaid plans offered by AT&T (Leap), T-Mobile (Metro), and DISH (Boost).[41]

47. Testimony reflects the fact that Verizon and TracFone are not close competitors. For example, Eduardo Diaz Corona testifies that "TracFone has long appealed to value-conscious consumers …. In contrast, Verizon has primarily focused on the postpaid segment, and has not targeted the value-conscious prepaid consumers that are TracFone's primary focus."[42] Similarly,

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[39] Opening Testimony of Angie Klein, Vice President, Consumer Segment Marketing, for Verizon Wireless, p. 2.

[40] Opening Testimony of Angie Klein, Vice President, Consumer Segment Marketing, for Verizon Wireless, p. 2.

[41] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., pp. 10-11.

[42] Opening Testimony of Eduardo Diaz Corona, Chief Executive Officer at TracFone Wireless, Inc., p. 9.

Paul Vasington, Director of Public Policy for Verizon, testifies that "Verizon does not generally directly target those customers, so Verizon and TracFone are not remotely close competitors."[43]

48. Although Verizon does have a small number of branded prepaid customers (approximately four million nationwide and [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] in California), its branded prepaid products are not close substitutes for TracFone.[44]

49. As a result of the substantial differentiation between their products, substitution between Verizon and Tracfone in response to a small price increase—the relevant metric for possible competitive effects—would surely be tiny, as each would have many closer options to turn to, with Verizon customers surely seeing AT&T and T-Mobile brands as closer substitutes, and with TracFone customers seeing the set of larger and closer prepaid alternatives as closer substitutes than Verizon's small and differentiated prepaid offerings (or certainly than Verizon postpaid offerings).

IV. THE TRANSACTION WOULD NOT MATERIALLY REDUCE WHOLESALE COMPETITION.

50. MVNOs can purchase wholesale network access from several MNOs, including AT&T, Verizon, and T-Mobile. In this section, I consider whether the merger would create incentives to raise wholesale network access rates and conclude that it is unlikely to do so. That is, I conclude

43 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 44.

44 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, pp. 44-45.

that, like horizontal harms, material vertical harms are unlikely. As a general matter, in cases where the merging parties' downstream brands are not close competitors, vertical mergers are likely to be procompetitive.[45]

A. THE CORRECT STANDARD FOR ASSESSING EFFECTS IN THE WHOLESALE MARKET IS THE EFFECT ON CONSUMERS.

51. From an economic perspective, the correct standard for assessing the effects of the transaction is the effect on consumers, not the effect on, for example, a specific competitor or set of competitors. This standard focuses on consumers and naturally incorporates the effects of efficiencies, including the reduction in marginal costs from the elimination of double marginalization, as well as all other competitive effects to reach a bottom-line conclusion about the transaction's competitive effects. Conversely, a focus on harm to MVNOs in the wholesale market, for example, distinct from the effects on consumers in the downstream market, would not constitute an appropriate standard for evaluating the effects of the merger because any such "harm" to MVNOs can reflect stronger competition from the merged firm. In particular, a TracFone that realizes substantially lower marginal costs would be a much more formidable competitor to other MVNOs, which would benefit consumers even if it reduces the margins of rival MVNOs, meaning the effects on MVNOs of the transaction is the wrong standard, as procompetitive, pro-consumer changes can harm rival MVNOs by increasing the competition they face.

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45 See note 18 above.

B. POST-MERGER, VERIZON RETAINS THE INCENTIVE TO SELL WHOLESALE NETWORK ACCESS TO COMPETITIVELY RELEVANT, DIFFERENTIATED MVNOS.

52. Although mergers of complementary assets in general and this merger in particular create tremendous benefits for consumers, they also, under certain, specific circumstances, have the potential to foreclose rivals or raise their costs, to the detriment of competition and consumers. However, for the reasons described above, such circumstances do not characterize the present case.

53. **First,** aside from TracFone, [**BEGIN CONFIDENTIAL LAWYERS ONLY CONFIDENTIAL**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**]. As discussed in Section II above, TracFone accounts for [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] percent of Verizon's wholesale prepaid customers.

54. The remaining MVNOs that purchase wholesale access to Verizon's network are differentiated, and Verizon has an incentive to continue to sell wholesale network access to them and other existing and new MVNOs in order to share in the value that they create.

- Cable companies are the primary remaining MVNO competitors. Cable providers' primary competitive value is that they can bundle postpaid wireless and wireline services together and thereby serve their own wireline subscribers effectively. Verizon will continue to have an incentive to sell wholesale network access to cable companies and share in that value. In particular, Verizon and, for example, Comcast and Charter are all sophisticated players who can be expected to continue to find ways to benefit mutually by serving that set of customers who would prefer to get wireless service bundled with their cable offering.

- Non-cable MVNOs other than TracFone account for [**BEGIN CONFIDENTIAL LAWYERS ONLY**] [redacted] [**END CONFIDENTIAL LAWYERS ONLY**] is an efficient way for Verizon to reach these customers who otherwise would migrate to another MNO.

55. Indeed, it is instructive that both AT&T and T-Mobile own substantial prepaid brands and continue to sell wholesale network access to MVNOs, including TracFone. They do so

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46 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, p. 47.

47 As explained on its website, GreatCall is "the leader in connected health for active aging" and "[w[ith health and safety solutions for older adults and their family caregivers, GreatCall's innovative suite of easy-to-use mobile products and award-winning approach to customer care helps aging consumers live more independent lives." (About Us, greatcall, *available at* https://www.greatcall.com/about-us, *site accessed* March 11, 2021.)

48 Opening Testimony of Paul Vasington, Director of Public Policy for Verizon, pp. 46-48.

because MVNOs are differentiated enough that they can create incremental value that the MNOs can share in by selling wholesale network access and MNOs have an incentive to make profitable sales.[49]

56. **Second**, MVNOs will continue to have three (and soon four once DISH finishes building out its network) MNOs from which to purchase wholesale network access. Thus, no one MNO can prevent an MVNO providing incremental value to consumers from being served. Rather, in any bilateral negotiation between an MNO and MVNO, the outside alternative for the MVNO is likely to be that another MNO provides wholesale network access, and the MVNOs can use confidential negotiations with each to play the MNOs off each other. Hence, even if an MNO wanted to harm a particular MNVO (which is unlikely for the reasons given above), the outside option in a bilateral negotiation is not that that MVNO simply goes without service, but rather that it turns to another MNO. Moreover, the transaction in no way inhibits the ability of other MNOs to sell wholesale network access to MVNOs.

V. THE TRANSACTION WOULD INCREASE COMPETITION FOR LIFELINE CUSTOMERS.

57. The merger will increase competition for LifeLine customers. As an initial matter, Verizon does not currently offer a wireless LifeLine product in California. Thus, the parties do not currently compete in the sale of LifeLine products and therefore the transaction will not reduce such competition. In contrast, TracFone does offer LifeLine products in California and I

[49] If there were another MVNO that was very similar to TracFone, then its potential subscribers would be better served by the option of a much lower-cost TracFone than by two very similar MVNOs both with much higher costs.

understand that Verizon intends to continue to offer those products. The same efficiencies described in Section II above apply to LifeLine products. Indeed, those efficiencies provide an incentive to continue to offer such products on competitive terms. The result will be a second facilities-based wireless LifeLine competitor (along with T-Mobile) in California.

EXHIBIT 1

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PROFESSIONAL EXPERIENCE HIGHLIGHTS

- Served as an expert for the Federal Government and private parties in cases involving: fixed and mobile telecommunications, cable television, broadband internet service, airlines, social media, other high technology industries, food distribution, coal and other energy markets, railroads, shipping, health insurance, financial markets, credit cards, retail, and many others.
- Testified in Federal Court, in multiple state courts, in front of the United States Copyright Royalty Judges, in front of international competition authorities, and in arbitration proceedings. Appeared in front of government agencies including DOJ, FTC, and FCC, and state agencies on behalf of numerous clients.
- Submitted expert reports in Federal Court, and affidavits, declarations, and papers to U.S. competition agencies, FCC, DOT, international competition authorities, and state regulators.
- Written numerous academic articles on topics including competition economics, merger policy, telecommunications, airlines, insurance markets, and labor markets. Research published in leading scholarly and applied journals including *The American Economic Review*, *The Rand Journal of Economics*, *International Journal of Industrial Organization*, *The Journal of Competition Law and Economics,* and many others, and presented to business, government, and academic audiences worldwide.
- Co-author of the chapter on Econometrics and Regression Analysis in the ABA Treatise, *Proving Economic Damages: Legal and Economic Issues,* 2017.

AREAS OF EXPERTISE

- Antitrust and competition economics; industrial organization economics
- Applied econometrics
- Economic and econometric analysis of horizontal and vertical mergers
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EDUCATION

- Ph.D., Economics, STANFORD UNIVERSITY, June 2001.
- M.S., Economics, UNIVERSITY OF WISCONSIN-MADISON, August 1992.
- B.A., Economics, ILLINOIS WESLEYAN UNIVERSITY, Summa Cum Laude, May 1991.

EMPLOYMENT HISTORY

Compass Lexecon: *Senior Managing Director*, Head of Compass Lexecon North American Antitrust Practice, January 2016 – Present.

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Kellogg School of Management, Northwestern University: *Assistant Professor of Management and Strategy*, 2000 – 2006; *Associate Professor of Management and Strategy*, 2007 – 2008.

State Farm Insurance: *Research Administrator*, 1992 – 1995.

RECENT PROFESSIONAL RECOGNITIONS

Global Competition Review Who's Who Legal, Thought Leader in Competition: 2019, 2020.

Global Competition Review Who's Who Legal, Global Leader in Competition – Economists 2020; Experts – Economics – Competition Economists 2020; Experts – Financial Advisory and Valuation – Quantum of Damages 2020.

Global Arbitration Review's International Who's Who of Commercial Arbitration, Leading Expert Witness, 2018.

LIVE TESTIMONIAL EXPERIENCE

Testimony as Economic Expert on behalf of Peabody Energy Corporation and Arch Coal, Inc., In the Matter of *Federal Trade Commission v. Peabody Energy Corporation and Arch Coal, Inc.*, In the United States District Court for the Eastern District of Missouri, Civil Action No. 4-20-cv-000317-SEP, Deposition: June 29, 2020; Live Trial Testimony: July 24, 2020.

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Testimony as Economic Expert on behalf of Trinity, In the Matter of *Jackson County, Missouri, Individually and on behalf of a class of others similarly situated, v. Trinity Industries, Inc., and Trinity Highway Products, LLC*, In the Circuit Court of Jackson County, Missouri at Independence, Case No. 1516-CV23684, Stage 1 Testimony: May 24, 2017; Stage 2 Deposition: November 14, 2019.

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Testimony as Economic Expert on behalf of Oscar Insurance Company of Florida, In the Matter of *Oscar Insurance Company of Florida v. Blue Cross and Blue Shield of Florida, Inc., d/b/a/ Florida Blue; Health Options Inc., d/b/a/ Florida Blue HMO; and Florida Health Care Plan Inc., d/b/a/ Florida Health Care Plans*, In the United States District Court Middle District of Florida Orlando Division, Case No. 6:18-cv-01944, Live Preliminary Injunction Hearing Testimony: January 23, 2019.

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Testimony as Economic Expert on behalf of Comcast Corporation, In the Matter of *Viamedia, Inc. v. Comcast Corporation and Comcast Spotlight, LP*, In the United States District Court Northern District of Illinois Eastern Division, Case No. 16-cv-5486, Deposition: January 5, 2018.

Testimony as Economic Expert on behalf of Energy Solutions, Inc., In the Matter of the *United States of America v. Energy Solutions, Inc., Rockwell Holdco, Inc., Andrews County Holdings, Inc., and Waste Control Specialists, LLC*, In the United States District Court for the District of Delaware, Civil Action No. 16-cv-01056-SLR, Deposition: April 17, 2017; Live Trial Testimony: May 2, May 3, 2017.

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- Comcast/Time Warner, January 2015
- AT&T/T-Mobile, July 2011
- Comcast/NBCUniversal, August 2010

Appearance before California Public Utility Commission, Public Hearings on Comcast/Time Warner Merger, Los Angeles, April 2015.

Appearance as Economic Expert in front of Department of Justice, Federal Trade Commission, Federal Communications Commission, and State Regulatory Agencies in many additional transactions, including: Danaher/NetScout, AT&T/Leap Wireless, T-Mobile/MetroPCS, American Airlines/US Airways, SpectrumCo/Cox/Verizon Wireless, oneworld antitrust immunity application, PepsiCo/bottlers, Houghton Mifflin/Harcourt, Chicago Mercantile Exchange/Chicago Board of Trade.

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Expert Report of Dr. Mark A. Israel, Between *Road Haulage Association and (1) – (10) MAN SE and Others and (1) Daimler AG, (2) Volvo Lastvagnar Aktiebolag*, In the Competition Appeal Tribunal, Case No. 1289/7/7/18, March 22, 2019.

Submission of Robert J. Calzaretta, Jr., Mark A. Israel, and Maya Meidan, "Assessing the Effects of ATI and JV Overlaps on Nonstop Fares: An Event Study Approach," submitted as part of a Supplement to Joint Motion to Amend Order 2010-7-8 for Approval of and Antitrust Immunity for Amended Joint Business Agreement, In the Application of American Airlines, Inc., British Airways PLC, OpenSkies SAS, Iberia Líneas Aéreas de España, S.A., Finnair OYJ, Aer Lingus Group DAC, Before the U.S. Department of Transportation, Washington, DC, Docket DOT-OST-2008-0252-, January 11, 2019.

Declarations of Mark A. Israel, In the Matter of *Oscar Insurance Company of Florida v. Blue Cross and Blue Shield of Florida, Inc., d/b/a Florida Blue; Health Options Inc., d/b/a Florida Blue HMO; and Florida Health Care Plan Inc., d/b/a Florida Health Care Plans,* In the United States District Court Middle District of Florida Orlando Division, Case No. 6:18-cv-01944, Declaration: November 19, 2018; Supplemental Declaration: December 21, 2018.

Reply Declaration of Mark Israel, Michael Katz, and Bryan Keating, In the Matter of Applications of T-Mobile US, Inc. and Sprint Corporation, Consolidated Applications for Consent to Transfer Control of Licenses and Authorizations, Federal Communications Commission, WT Docket No. 18-197, September 17, 2018.

Expert Report of Gustavo Bamberger, Robert Calzaretta, and Mark Israel, In the Joint Application of Hawaiian Airlines, Inc. and Japan Airlines, Co., Ltd., Appendix 6 to "Joint Application for Approval of and Antitrust Immunity for Alliance Agreements," Department of Transportation, Case No. DOT-OST-2018-0084, June 13, 2018.

Expert Reports of Mark A. Israel, In the Matter between *Cygnus Electronics Corporation and Sean Allott and Panasonic Corporation et al.,* In the Ontario Superior Court of Justice, Court File No. 3795/14CP, Initial Report: November 17, 2017; Reply Report: February 23, 2018; Supplemental Report: May 22, 2018.

Expert Report of Mark A. Israel, In the Matter of the *Federal Trade Commission v. Wilh. Wilhelmsen Holding ASA Wilhelmsen Maritime Services As Resolute Fund II, L.P. Drew Marine Intermediate II B.V. and Drew Marine Group, Inc.*, In the United States District Court for the District of Columbia, No. 1:18-cv-00414-TSC, May 11, 2018.

Reports of Dr. Mark A. Israel, In the Matter of *Viamedia, Inc. v. Comcast Corporation and Comcast Spotlight, LP*, In the United States District Court for the Northern District of Illinois Eastern Division, Case No. 16-cv-5486, Rebuttal Report: November 30, 2017; Errata Sheet for Rebuttal Report: January 4, 2018.

Declaration of Mark A. Israel, In the Matter between *Robert Foster and Murray Davenport and Sears Canada Inc. et al.*, In the Ontario Superior Court of Justice, Court File No. 766-2010 CP, November 1, 2017.

Expert Report of Mark Israel and Bryan Keating, "Economic Analysis of Dr. Evans' Claims as They Relate to *Restoring Internet Freedom*," Federal Communications Commission, WC Docket No. 17-108, October 31, 2017.

Written Rebuttal Testimony of Dr. Mark A. Israel, In the Matter of Distribution of Cable Royalty Funds, Before the Copyright Royalty Judges, Washington, D.C., No. 14-CRB-0010-CD, September 15, 2017.

Declaration of Mark A. Israel, Allan L. Shampine, and Thomas A. Stemwedel, In the Matter of Restoring Internet Freedom, Federal Communications Commission, WC Docket No. 17-108, July 17, 2017.

Expert Report of Dr. Mark A. Israel, In the Matter of *St. Clair County, Illinois, and Macon County, Illinois, Individually and on behalf of all other counties in the State of Illinois, v. Trinity Industries, Inc. and Trinity Highway Products, LLC*, In the United States District Court for the Southern District of Illinois, Civil Action No.: 3:14-cv-1320, April 25, 2017.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America v. Energy Solutions, Inc., Rockwell Holdco, Inc., Andrews County Holdings, Inc., and Waste Control Specialists, LLC*, In the United States District Court for the District of Delaware, Civil Action No. 16-cv-01056-SLR, Initial Report: March 27, 2017; Rebuttal Report: April 10, 2017.

Expert Report of Mark A. Israel, In the Matter of *Jackson County, Missouri, Individually and on behalf of a class of others similarly situated, v. Trinity Industries, Inc., and Trinity Highway Products, LLC*, In the Circuit Court of Jackson County, Missouri at Independence, Case No. 1516-CV23684, March 24, 2017.

Expert Report of Mark A. Israel, In the Matter of *Honeywell International Inc. v. iControl Networks, Inc. and Alarm.com Holdings, Inc.*, In the United States District Court for the District of New Jersey, No. 2:17-cv-01227, February 26, 2017.

Written Direct Testimony of Dr. Mark A. Israel, In the Matter of Distribution of Cable Royalty Funds, Before the Copyright Royalty Judges, Washington, D.C., No. 14-CRB-0010-CD (2010-13), December 22, 2016.

Expert Report of Mark Israel, In the Matter of *Social Ranger, LLC v. Facebook, Inc.*, In the United States District Court for the District of Delaware, C.A. No. 14-1525-LPS, November 23, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and DENSO Corporation et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-135610, November 15, 2016.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America et al. v. Anthem Inc. and Cigna Corp.*, In the United States District Court, District of Columbia, No. 16-cv-01493 (ABJ), Initial Report: October 7, 2016; Supplemental and Rebuttal Report: October 28,2016.

Verified Statements of Mark Israel and Jonathan Orszag, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), Initial Verified Statement: July 26, 2016; Reply Verified Statement: August 26, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Analysis of the Regressions and Other Data Relied Upon in the Business Data Services FNPRM And a Proposed Competitive Market Test," Federal Communications Commission, WC Docket Nos. 16-143, 15-247, 05-25, RM-10593, Second Declaration: June 28, 2016; Third Declaration: August 9, 2016.

Expert Declaration of Mark A. Israel, In the Matter of *Liberman Broadcasting, Inc. and LBI Media, Inc. v. Comcast Corporation and Comcast Cable Communications, LLC*, Federal Communications Commission, MB Docket No. 16-121, June 7, 2016.

Expert Report of Mark A. Israel, In the Matter of *La Crosse County, Individually, and on behalf of all others similarly situated v. Trinity Industries, INC. and Trinity Highway Products, LLC*, In the United States District Court, Western District of Wisconsin, Case No. 3:15-cv-00117-scl, May 27, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and Nippon Yusen Kabushiki Kaisha et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-134895, May 20, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, In the Matter of Special Access Rates for Price Cap Local Exchange Carriers, Federal Communications Commission, WC Docket No. 05-25, Declaration: February 19, 2016; Supplemental Declaration: March 24, 2016; Second Supplemental Declaration: April 20, 2016.

Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Competitive Analysis of the FCC's Special Access Data Collection," Federal Communications Commission, WC Docket No. 05-25, January 26, 2016.

Declaration of Dr. Mark Israel, In the Matter of *iPic – Gold Class Entertainment, LLC et al., v. Regal Entertainment Group, AMC Entertainment Holdings, Inc., et al.*, In the District Court of Harris County, Texas, 234th Judicial District, No. 2015-68745, January 18, 2016.

Declaration of Dennis Carlton, Mark Israel, Allan Shampine & Hal Sider, "Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans," Federal Communications Commission, WC Docket No. 15-247, January 7, 2016.

Declaration of Mark A. Israel, Attached to "Response of AT&T Mobility LLC to Notice of Apparent Liability for Forfeiture," Federal Communications Commission, File No. EB-IHD-14-00017504, July 17, 2015.

Reports in the Matter of *Federal Trade Commission et al. v. Sysco Corporation and USF Holding Corp.*, In the United States District Court for the District of Columbia, Civil Action No. 1:15-cv-00256 (APM), Declaration: February 18, 2015; Report: April 14, 2015; Rebuttal Report: April 21, 2015.

Declaration of Mark A. Israel, Bryan G. M. Keating, and David Weiskopf, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Voice and Broadband Services in California," December 3, 2014.

Expert Report of Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," Federal Communications Commission, MB Docket No. 14-57, September 22, 2014.

Supplemental Declaration of Mark Israel and Allan Shampine, In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent, Appendix A to "Reply Comments of the National Association of Broadcasters," Federal Communications Commission, MB Docket No. 10-71, July 24, 2014.

Declaration of Mark Israel and Allan Shampine, In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent, Appendix B to "Comments of the National Association of Broadcasters," Federal Communications Commission, MB Docket No. 10-71, June 26, 2014.

Expert Report of Mark A. Israel, "Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition," Federal Communications Commission, MB Docket No. 14-57, April 8, 2014.

Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Sprint's Proposed Weighted Spectrum Screen Defies Economic Logic and Is Inconsistent with Established Facts," Federal Communications Commission, WT Docket No. 12-269, March 14, 2014.

Reply Declaration of Mark A. Israel, "Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T: A Reply Declaration," Federal Communications Commission, WT Docket No. 13-193, October 23, 2013.

Declaration of Mark A. Israel, "An Economic Analysis of Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T," Federal Communications Commission, WT Docket No. 13-193, August 1, 2013.

Supplemental Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comments on Appropriate Spectrum Aggregation Policy with Application to the Upcoming 600 MHz Auction," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comment on the Submission of the U.S. Department of Justice Regarding Auction Participation Restrictions," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Spectrum Aggregation Policy, Spectrum-Holdings-Based Bidding Credits, and Unlicensed Spectrum," Federal Communications Commission, GN Docket No. 12-268, March 12, 2013.

Declaration of Igal Hendel and Mark A. Israel, "Econometric Principles That Should Guide the Commission's Analysis of Competition for Special Access Service," Federal Communications Commission, WC Docket No. 05-25, February 11, 2013.

Declarations of Mark A. Israel and Michael L. Katz, "Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings," Federal Communications Commission, WT Docket No. 12-269, Declaration: November 28, 2012; Reply Declaration: January 7, 2013.

Declaration of Mark Israel, "An Economic Assessment of the Prohibition on Exclusive Contracts for Satellite-Delivered, Cable-Affiliated Networks," Federal Communications Commission, MB Docket Nos. 12-68, 07-18, & 05-192, September 6, 2012.

Expert Report of Mark Israel, "Implications of the Verizon Wireless & SpectrumCo/Cox Commercial Agreements for Backhaul and Wi-Fi Services Competition," Federal Communications Commission, WT Docket No. 12-4, August 1, 2012.

Expert Report of Mark A. Israel, Michael L. Katz, and Allan L. Shampine, "Promoting Interoperability in the 700 MHz Commercial Spectrum," Federal Communications Commission, WT Docket No. 12-69, July 16, 2012.

Affidavits of Dr. Mark A. Israel in the Matter of *Bloomberg L.P. v. Comcast Cable Communications, LLC*, Federal Communications Commission, MB Docket No. 11-104, Declaration: June 21, 2012; Declaration: June 8, 2012; Supplemental Declaration: September 27, 2011; Declaration: July 27, 2011.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Response to Supplementary Comments of Hubert Horan," Docket DOT-OST-2009-1055, October 22, 2010.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Measuring Consumer Benefits from Antitrust Immunity for Delta Air Lines and Virgin Blue Carriers," Docket DOT-OST-2009-1055, October 13, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Economic Analysis of the Proposed Comcast-NBCU-GE Transaction," Federal Communications Commission, MB Docket No. 10-56, July 20, 2010.

Expert Report of Mark Israel and Michael L. Katz, "The Comcast/NBCU Transaction and Online Video Distribution," Federal Communications Commission, MB Docket No. 10-56, May 4, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Application of the Commission Staff Model of Vertical Foreclosure to the Proposed Comcast-NBCU Transaction," Federal Communications Commission, MB Docket No. 10-56, February 26, 2010.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity: Response of Robert Willig, Mark Israel, and Bryan Keating" in Docket DOT-OST-2008-0252, January 11, 2010.

Affidavit of Dr. Mark A. Israel on Class Certification in the Matter of Puerto Rican Cabotage Antitrust Litigation, in the United States District Court for the District of Puerto Rico, MDL Docket No. 3:08-md-1960 (DRD), December 10, 2009.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity," Docket DOT-OST-2008-0252, September 8, 2009.

Expert Report and Supplemental Expert Report of Dennis W. Carlton and Mark Israel in the Matter of *Toys "R" Us-Delaware, Inc., and Geoffrey Inc. v. Chase Bank USA N.A.*, in American Arbitration Association New York, New York, Commercial Arbitrations No. 13-148-02432-08, Expert Report: February 27, 2009; Supplemental Expert Report: March 20, 2009.

Expert Reports of James Levinsohn and Mark Israel, In the Matter of 2006 NPM Adjustment Proceeding pursuant to Master Settlement Agreement, October 6, 2008, January 16, 2009, March 10, 2009.

SELECTED OTHER EXPERT WORK IN REVIEW OF MERGERS/TRANSACTIONS

Successful acquisition of Innovative Industries, Inc. by Ex Libris. 2020. Served as lead economist in interactions with FTC. Demonstrated that the acquisition would not harm competition due to the *de minimis* extent of head-to-head competition between Ex Libris and Innovative and the recent decline of Innovative' s business. FTC closed investigation allowing acquisition to proceed with no conditions.

Successful acquisition of TD Ameritrade by Charles Schwab. 2020. Served as lead economist in interactions with DOJ. Presented analyses demonstrating broad market for investor dollars rather than narrow market for RIA Custodian Services. DOJ closed investigation allowing acquisition to proceed with no conditions.

Successful acquisition of Reinhart Foodservice by Performance Food Group Company. 2019. Served as lead economics expert on behalf of the parties in the FTC's investigation of the merger. Presented detailed data analyses showing ample competition and lack of harm to competition in any geographic market. FTC closed the investigation with no divestitures required in late 2019.

Successful acquisition of SGA's Food Group of companies by US Foods. 2019. Served as lead economic expert on behalf of the parties in the FTC's investigation of the merger. Presented detailed economics and econometric analyses showing ample competition and lack of harm to competition in any geographic market. FTC cleared the merger subject to divestitures in three geographic markets in the Fall of 2019.

Successful acquisition of Time Warner by AT&T Inc. 2017-2019. Lead economist throughout the DOJ investigation. Then director of all economic work during trial, serving as the central connection point between all experts and counsel and directing development of all aspects of the economic case. Defendants ultimately prevailed in trial and the merger closed in June 2018.

Successful acquisition of Keystone Foods by Tyson Foods, Inc. 2018. Served as lead economic expert for U.S. jurisdiction. Presented economic analyses demonstrating that competition would remain strong post-merger. Ultimately, antitrust agencies in the U.S., China, Japan, and Korea cleared the transaction.

Successful acquisition of NEX Group PLC by CME Group Inc. 2018. Co-lead economic expert with Thomas Stemwedel. Presented several econometric analyses demonstrating that Treasury futures contracts and cash Treasury securities were economic complements rather than substitutes. Based heavily on these Compass Lexecon submissions, the DOJ and CMA closed their investigations without requiring any divestitures.

Successful acquisition of VCA Inc. by Mars, Inc. 2017. Co-lead economic expert with Mary Coleman. Made multiple presentations to FTC demonstrating ample competition in general, emergency, and specialty veterinary services, including econometric analyses showing lack of direct competitive impact of Mars and VCA on one another. Transaction was ultimately cleared subject to a small number of divestitures.

Successful acquisition of Mobileye by Intel. 2017. Served as lead economic expert for Intel. Assisted counsel in preparing FTC presentations and materials demonstrating lack of significant head-to-head competition and lack of valid vertical foreclosure theories. Investigation was closed without Second Request.

FTC litigation against DraftKings, Inc. and FanDuel Inc. (Civil Action No. 17-cv-1195 (KBJ)). 2017. Served as lead economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to the parties' abandonment of the proposed merger. Developed economic and econometric evidence that the merging parties were closest substitutes and thus likely would have increased prices as a result of their proposed merger.

Successful merger of ASE Group and SPIL. 2017. Lead economic expert on behalf of ASE Group. Submitted reports and testified to the Taiwan Fair Trade Commission, which ultimately cleared the transaction, then made multiple presentations to U.S. FTC, which also cleared the transaction. Economic analyses focused on implications of profit margins for market definition and competitive effects, ultimately demonstrating that the transaction was unlikely to cause significant harm to competition.

Successful acquisition of Alarm.com of two business units (Connect and Piper) from iControl Networks. 2017. Led team that demonstrated substantial and growing competition in home security and connected home marketplace and thus lack of competitive harm from acquisition. Work focused on importance of downstream market definition as well as empirical evidence of impact of competition on Alarm.com pricing and profitability.

Successful acquisition of Samsung Electronics, Ltd.'s printer business by HP Inc. 2016. Led team in evaluating the competitive effects of the acquisition, including assessing shares and competitive effects in overlap areas. Notably, the transaction gained regulatory approval in the U.S. during the initial review period without issuing a Second Request.

Successful acquisition of Sun Products Corp. by Henkel AG. 2016. Led team demonstrating lack of competitive impact despite overlaps in laundry detergent and related products.

Successful acquisition of Starwood Hotels & Resorts by Marriott International. 2016. Led team that performed detailed analysis of competitive conditions, extensive econometric analysis of pricing, and full review of Marriott's internal pricing models to demonstrate that Starwood and Marriott were not close competitors, combined ownership of the brands would not lead to upward pricing pressure, and competition would remain robust post-merger.

Successful acquisition of PR Newswire by GTCR. 2016. Lead economic expert for GTCR. Made presentations to DOJ showing lack of competitive harm from the transaction, based on detailed analysis of win/loss data, including calculations showing no possible upward pricing pressure (UPP) concerns regardless of the level of margins.

Successful acquisition of Schurz Communications' Broadcast Stations by Gray Television. 2015. Lead economic expert for Gray. Made presentations to DOJ demonstrating output expanding effects of proposed transaction in light of the scale economies in television production and advertising and the small size of the DMAs affected by the transaction.

Successful acquisition of the Communications Business of Danaher Corporation by NetScout Systems. 2015. Lead economic expert for NetScout. Made presentations to DOJ describing proper economic framework for analysis of competition and potential merger harms, and demonstrated that the presence of multiple viable competitors and numerous other credible threats to be used by powerful buyers in a dynamic industry made theories of anti-competitive harm from the merger implausible.

Successful acquisition of Windmill Distribution Co. by Manhattan Beer Distributors. 2015. Lead economic expert for Manhattan Beer Distributors. Submitted White Paper to DOJ demonstrating, based on margin data, that the merger would be highly unlikely to lead to anti-competitive effects. Transaction was granted early termination from the Hart Scott Rodino process by the DOJ.

Proposed acquisition of Time Warner Cable by Comcast Corporation. 2014-2015. Served as lead economic expert on broadband issues on behalf of Comcast Corporation. Submitted multiple Declarations and made multiple presentations to DOJ and FCC, explaining lack of horizontal, bargaining, or vertical/foreclosure concerns with regard to broadband competition as a result of the transaction.

Successful acquisition of Leap Wireless by AT&T. 2014. Lead economic expert for AT&T. Submitted multiple Declarations to FCC and made presentation to DOJ, demonstrating the transaction would generate substantial consumer benefits, while generating at most minimal upward pricing pressure in a properly defined mobile wireless services market and no issues related to spectrum concentration or other competitive concerns.

Successful merger of American Airline and US Airways. 2013. Lead consulting expert, managing Compass Lexecon team of over 25 economists supporting multiple experts. Made multiple presentations to DOJ, worked on expert reports in litigation, and assisted counsel with the analysis leading to settlement of litigation, permitting transaction to close.

Successful merger of T-Mobile USA and MetroPCS. 2013. Lead economic expert for T-Mobile USA. Conducted economic analyses of competitive effects of the transaction, as well as consumer benefits from reduced costs and increased network quality. Presented analyses to both DOJ and FCC.

FTC investigation of acquisition of Dollar Thrifty Automotive Group by Hertz. 2012. Served as a lead economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to case settlement. Conducted empirical analyses based on previous rental car mergers demonstrating likely price increases from the transaction.

Decision by Federal Communications Commission not to extend the ban on exclusive contracts for satellite-delivered, cable-affiliated networks. 2012. Lead economic expert for National Cable and Telecommunications Association. Submitted economic analysis demonstrating that the ban on exclusive distribution of satellite-delivered, cable affiliated networks is no longer warranted given increased marketplace competition. FCC made decision to allow the ban to sunset.

Successful sale of wireless spectrum by SpectrumCo and Cox ("Cable Companies") to Verizon Wireless and successful completion of related commercial agreements. 2012. On behalf of the Cable Companies, performed economic analyses demonstrating lack of competitive harm from the transaction on markets for backhaul and Wi-Fi services. Presented analyses to FCC.

Successful acquisition by LIN Media of broadcast television stations from NVTV. 2012. Lead economic expert for LIN Media. Prepared economic analysis demonstrating lack of competitive concern over potential issues related to Shared Service and Joint Sale Arrangements.

Proposed acquisition of T-Mobile USA by AT&T. 2011. Served as one of the lead economists, initially for T-Mobile (along with Michael Katz) and ultimately for both parties (along with Michael Katz and Dennis Carlton). Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop, ex parte meeting.

S*uccessful application for antitrust immunity by Delta and Virgin Blue*. 2010. Together with Robert Willig, Bryan Keating, and Jon Orszag, prepared economic analyses demonstrating substantial net consumer benefits from antitrust immunity. Submitted results in expert reports to Department of Transportation.

Successful joint venture between Comcast and NBC Universal (and ultimate full acquisition of NBC Universal by Comcast). 2010. Served as one of the lead economists (along with Michael Katz) on behalf of the merging parties. Wrote multiple reports submitted to FCC (with Michael Katz) demonstrating lack of significant competitive concerns from the transaction. Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop of economists, ex parte meeting.

Successful application for antitrust immunity for oneworld alliance and associated joint venture of American Airlines, British Airways, and Iberia Airlines. 2009-2010. Together with Robert Willig and Bryan Keating, prepared economic analyses demonstrating substantial net consumer benefits associated with antitrust immunity for the joint venture. Submitted results in expert reports to Department of Transportation.

Successful acquisition by PepsiCo of bottlers, PBG and PAS. 2009. Performed econometric and simulation analyses demonstrating pro-competitive effect of merger on PepsiCo's own brands, other brands distributed by PBG and PAS, and overall marketplace. Presented results to FTC (together with Dennis Carlton).

Successful merger of Delta Airlines and Northwest Airlines. 2008. In support of Dennis Carlton, developed empirical and theoretical analyses to demonstrate merger's pro-competitive nature. Work focused on (ultimately settled) private litigation opposing the merger.

Successful acquisition of Harcourt Education by Houghton Mifflin. 2007. Along with Daniel Rubinfeld and Frederick Flyer, developed econometric analyses demonstrating lack of competitive harm from proposed merger. Presented results to DOJ.

Successful acquisition of Chicago Board of Trade by Chicago Mercantile Exchange. 2007. Along with Robert Willig and Hal Sider, developed and presented multiple empirical analyses demonstrating lack of competitive harm from merger. Submitted multiple white papers and made multiple presentations to DOJ.

SELECTED OTHER EXPERT/CONSULTING WORK

Led team supporting Dennis Carlton's testimony in Toshiba/Hannstar TFT-LCD Antitrust litigation vs. Plaintiff Best Buy, 2013.

Led team supporting Dennis Carlton's testimony in Toshiba's TFT-LCD Class Action Antitrust litigation. Named Litigation Matter of the Year for 2012 by *Global Competition Review*, 2012.

As economic expert for US Airways, developed econometric analysis of air traffic at major US airports, presented to Philadelphia Airport management team, 2011.

Prepared analysis of the competitive impact of low-cost-carrier competition in Washington, D.C. and New York airports. Filed with DOT, 2011.

On behalf of major pharmaceutical firm, developed econometric model to forecast pharmaceutical expenditures, 2009.

Developed econometric model to measure of the importance of network effects in credit cards in the context of measuring damages incurred by a major credit card issuer, 2007-2008.

OTHER CONFIDENTIAL CONSULTING WORK IN THE FOLLOWING INDUSTRIES

Automobiles and Components

Consumer Durables

Consumer Services

Financial Services

Energy

Food, Beverage, and Tobacco

Healthcare Equipment and Services

Media

Pharmaceuticals, Biotechnology, and Life Sciences

Retail

Semiconductors and Semiconductor Equipment

Software and Related Services

Technology: Hardware and Equipment

Telecommunication Services

Transportation

Utilities

PUBLICATIONS

"Effects of the 2010 Horizontal Merger Guidelines on Merger Review: Based on Ten Years of Practical Experience," (with Dennis W. Carlton), Volume 58, Issue 2, in the *Review of Industrial Organization*, March 2021.

"Lessons from *AT&T/Time Warner,*" (with Dennis W. Carlton and Allan L. Shampine), *Competition Policy International*, July 2019.

"Are You Pushing Too Hard? Lower Negotiated Input Prices as a Merger Efficiency," (with Thomas A. Stemwedel and Ka Hei Tse), Volume 82, Issue 2, Pages 623-642, in the *Antitrust Law Journal*, April 2019.

"Vertical Integration in Multichannel Television Markets: Revisiting Regional Sports Networks Using Updated Data," (with Georgi Giozov, Nauman Ilias, and Allan Shampine), Volume 4:1 in *The Criterion Journal on Innovation*, 2019.

"Are Legacy Airline Mergers Pro- or Anti-Competitive? Evidence from Recent U.S. Airline Mergers," (with Dennis Carlton, Ian MacSwain, and Eugene Orlov), Volume 62, Pages 58-95, in the *International Journal of Industrial Organization*, January 2019.

"Competitive Effects of International Airline Cooperation," (with Robert J. Calzaretta and Yair Eilat), Volume 13, Issue 3, Pages 501-548, in the *Journal of Competition Law & Economics*, September 2017.

"Econometrics and Regression Analysis," (with Chris Cavanagh, Paul Denis, and Bryan Keating), Chapter 6 in the *American Bar Association's Proving Antitrust Damages: Legal and Economic Issues, Third Edition*, 2017.

"Complementarity without Superadditivity," (with Steven Berry, Philip Haile, and Michael Katz), Volume 151, Pages 28-30, in *Economics Letters*, February 2017.

"Antitrust in a Mobile World," (with Yonatan Even, Jonathan M. Jacobson, Scott Martin, and Dr. Helen Weeds), Chapter 17 of *International Antitrust Law & Policy: Fordham Competition Law 2015*, Edited by James Keyte, Juris Publishing, Inc., 2016.

"Buyer Power in Merger Review," (with Dennis W. Carlton and Mary Coleman), Chapter 22 of *The Oxford Handbook of International Antitrust Economics*, Volume 1, Roger D. Blair and D. Daniel Sokol, eds, Oxford University Press, 2015.

"The Evolution of Internet Interconnection from Hierarchy to 'Mesh': Implications for Government Regulation," (with Stanley M. Besen), *Information Economics and Policy*, December 2013.

"Airline Network Effects and Consumer Welfare," (with Bryan Keating, Dan Rubinfeld, and Robert Willig), *Review of Network Economics*, November 2013.

"The Delta-Northwest Merger: Consumer Benefits from Airline Network Effects (2008)," (with Bryan Keating, Daniel L. Rubinfeld, and Robert D. Willig), *The Antitrust Revolution*, Sixth Edition, Edited by John E. Kwoka, Jr. and Lawrence J. White, Oxford University Press, New York, July 2013.

"Proper Treatment of Buyer Power in Merger Review," (with Dennis W. Carlton), *Review of Industrial Organization*, July 2011.

"Response to Gopal Das Varma's Market Definition, Upward Pricing Pressure, and the Role of the Courts: A Response to Carlton and Israel," (with Dennis W. Carlton), *The Antitrust Source*, December 2010.

"Will the New Guidelines Clarify or Obscure Antitrust Policy?" (with Dennis W. Carlton), *The Antitrust Source,* October 2010.

"Should Competition Policy Prohibit Price Discrimination?" (with Dennis W. Carlton), *Global Competition Review*, 2009.

"The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data," (with Jonathan Orszag), Paper commissioned by National Collegiate Athletic Association, available *at* http://www.epi.soe.vt.edu/perspectives/policy_news/pdf/NCAASpending.pdf, February 2009.

"Services as Experience Goods: An Empirical Examination of Consumer Learning in Automobile Insurance," *The American Economic Review*, December 2005.

"Tenure Dependence in Consumer-Firm Relationships: An Empirical Analysis of Consumer Departures from Automobile Insurance Firms," *The Rand Journal of Economics*, Spring 2005.

"The Impact of Youth Characteristics and Experiences on Transitions Out of Poverty," (with Michael Seeborg), *Journal of Socio-Economics*, 1998.

"Racial Differences in Adult Labor Force Transition Trends," (with Michael Seeborg), *Journal of Economics*, 1994.

SELECTED RECENT PRESENTATIONS

American Bar Association Section of Antitrust Law, "Nuts & Bolts of Presenting Economic Evidence to the Agencies: Common Pitfalls and Best Practices, Panelist, October 2019.

Dechert LLP, 2019 Annual Antitrust Spring Seminar, Keynote Speaker, March 2019.

Concurrences Review and The George Washington University Law School, 6th Bill Kovacic Antitrust Salon: Where is Antitrust Policy Going?, "A Judge's Eye View on Antitrust: Mergers, Cartels, Remedies…," Panelist, September 2018.

Fordham Competition Law Institute, 45th Annual Conference on International Antitrust Law and Policy, "Merger Remedies," Panelist, September 2018.

Georgetown Center for Business and Public Policy, "Airline Competition Conference," Panelist, July 2017.

J.P. Morgan Special Situations Investor Forum, “The Antitrust Merger Review Process,” Panelist, March 2017.

American Bar Association Section of Antitrust Law, “Economic Issues Raised In The Comcast – Time Warner Cable Merger,” Panelist, February 2016.

Fordham Competition Law Institute, 42nd Annual Conference on International Antitrust Law and Policy, “Antitrust in a Mobile World,” Panelist, October 2015.

American Bar Association Section of Antitrust Law, “Merger Practice Workshop,” Faculty Member, October 2015.

Searle Center Conference on Antitrust Economics and Competition Policy, Panel on Recent Transactions in the Telecom Industry, Panelist, September 2015.

National Bureau of Economic Research, Summer Institute 2015, Industrial Organization Meetings, “Panel Discussion of the Comcast-Time Warner Merger,” Panelist, July 2015.

Federal Communications Bar Association, “How the Antitrust Agencies and the FCC are Likely to Analyze Vertical Mergers,” Panelist, November 2014.

The Coca Cola Company Global Antitrust Forum, “Round Table Discussion on Use of Economics and Economists,” Panel Chair, November 2014.

Compass Lexecon Competition Policy Forum, Lake Como Italy, “Consolidation of the Telecoms Industry in the EU and the U.S.,” Panelist, October 2014.

The IATA Legal Symposium 2014, Aviation Law: Upfront and Center, “Merger Analysis – A sudden shift in approach by DOJ in the American Airlines and US Airways merger,” Panelist, February 2014.

Georgetown Law 7th Annual Global Antitrust Enforcement Symposium, “Merger Enforcement and Policy,” Panelist, September 2013.

American Bar Association Section of Antitrust Law, “Airline Mergers: First Class Results or Middle-Seat Misery?” Panelist, May 2013.

American Bar Association Section of Antitrust Law, “Go Low or Go Home! Monopsony a Problem?” Panelist, March 2012.

Federal Communications Bar Association Transactional Committee CLE Seminar, “The FCC’s Approach to Analyzing Vertical Mergers,” Panelist, October 2011.

The Technology Policy Institute Aspen Forum, “Watching the Future: The Economic Implications of Online Video,” Panelist, August 2011.

American Bar Association Forum on Air & Space Law, 2011 Update Conference, “Antitrust Issues: What’s on the Horizon for the Industry,” Panelist, February 2011.

American Bar Association Section of Antitrust Law, “Antitrust in the Airline Industry,” Panelist, September 2010.

GRANTS AND HONORS

Searle Fund for Policy Research Grant, 2004-2006, for "An Empirical Examination of Asymmetric Information in Insurance Markets."

Kellogg School of Management Chairs' Core Course Teaching Award, 2003 & 2005.

Bradley Dissertation Fellowship, Stanford University, 1999-2000.

Stanford University, Outstanding Second Year Paper Prize, 1997.

ADVISORY, EDITORIAL, AND TRUSTEE BOARDS

Global Competition Review, Editorial Board, Member

Holton-Arms School, Board of Trustees, Trustee

Illinois Wesleyan University, Board of Trustees, Trustee

REFEREE FOR ACADEMIC JOURNALS

American Economic Review

The Journal of Industrial Economics

The Rand Journal of Economics

Journal of the European Economic Association

The Review of Economic Studies

The Review of Economics and Statistics

Journal of Risk and Insurance