

in assuming a target service level of 80 percent of calls answered within 120 seconds. Below, I show that my results are robust to assuming higher service levels.

19. In my *NPRM Declaration*, I demonstrated that VRS providers can attain high VRS efficiency at relatively low call volumes and incremental VRS efficiency gains quickly fall as volume increases.³² This finding is consistent with previous analysis submitted to the Commission, including analysis by GoAmerica.³³ To demonstrate that this finding is also robust to both of Mr. Turner's parameter critiques, I replicate my previous analysis and conduct several sensitivity analyses.³⁴ Specifically, I conduct analyses for each of the following sets of parameter values:

1. I relax the assumption that the VRS efficiency level cannot be sustained significantly above 50 percent by assuming that maximal VRS efficiency level (VRS Eff in the figure below) is 60 percent;
2. I increase the target level of service (SvcLvl in the figure) by applying Sorenson's internal service level target described in paragraph 18 above (instead of assuming 80 percent of calls would be answered within 120 seconds as in previous comments);³⁵ and
3. I increase the maximal VRS efficiency level to 60 percent and increase the target service level to Sorenson's internal service level target.

³² *Katz NPRM Declaration*, ¶ 34.

³³ *GoAmerica Comment* at 5 and 6.

³⁴ *Katz NPRM Declaration*, ¶ 34.

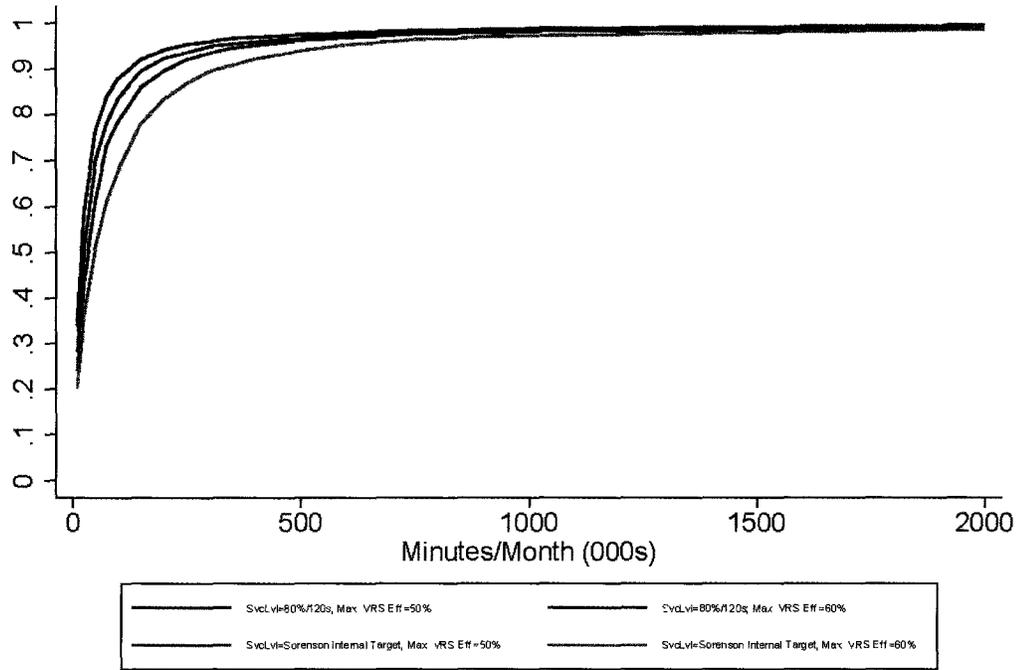
³⁵ *Katz NPRM Declaration*, note 57.

20. As Figure 1 clearly illustrates, regardless of the specification used, substantially all of the efficiencies attained from the provision of interpreters are exhausted by the time a VRS provider reaches 500,000 minutes per month, and 90 percent of the attainable efficiencies are achieved at lower thresholds of 100,000 to 350,000 minutes per month, depending on the specification. *****BEGIN HIGHLY CONFIDENTIAL*****

*****END HIGHLY CONFIDENTIAL***** minutes per month, and CSDVRS providing approximately *****BEGIN HIGHLY CONFIDENTIAL***** *****END HIGHLY CONFIDENTIAL***** minutes per month.³⁶ Even under the most conservative set of assumptions, a VRS provider operating at Purple's volume should be able to achieve approximately *****BEGIN HIGHLY CONFIDENTIAL***** *****END HIGHLY CONFIDENTIAL***** percent of the maximal attainable efficiency.

³⁶ *Structure and Practices of the Video Relay Service Program and Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Further Notice of Proposed Rulemaking*, CG Docket Nos. 10-51 and 03-123, Notice of Ex Parte Conference, Purple Communications, Inc., Highly Confidential Attachment at 7; CSDVRS Rolka Submission HIGHLY CONFIDENTIAL.xlsx[RLSA Reconciliation].

Figure 1: Queuing Efficiency Sensitivity Analysis



Based on the Erlang C model
 Minute distribution and average talk time based on data from Sorenson Communications, Inc. (Week of Feb 5-11, 2012)

21. It is notable that comments submitted by CSDVRS are consistent with my conclusions and inconsistent with Mr. Turner’s analysis. In particular, CSDVRS presents an analysis that shows that “CA Related & Non-CA Relay Center Costs” decline by just three percent on a per-minute basis as a VRS provider expands from 500,000 minutes per month to 5,000,000 minutes per month, which indicates that economies of scale in communications assistant and relay center costs are not significant.³⁷ As I discuss below, CSDVRS’s estimates of reductions in SG&A costs as volume increases are also consistent with my previous analysis.

³⁷ CSDVRS Comments, Table 1.

2. Mr. Turner draws illogical conclusions from changes in costs over time.

22. Mr. Turner observes that “total industry per-minute indirect costs dropped 11.3% between 2010 and 2012, as volumes increased by 8.7%.”³⁸ He then implicitly *assumes* that the change in average indirect costs must be due to the increase in volume and asserts that these trends prove economies of scale are significant.³⁹ Straightforward arithmetic demonstrates that Mr. Turner’s assumption cannot possibly be correct; it is inconsistent with the numbers that he cites.

23. To see this point, first observe that the strongest possible form of economies of scale with respect to indirect costs arises when all indirect costs are fixed, so that a firm with a larger volume incurs no more costs than does a firm with a smaller volume. Let F denote these fixed costs, and let M denote the number of minutes of VRS provided by the firm. Then the indirect costs per minute are F/M . If volume increased by $\lambda \times 100$ percent, then indirect costs per minute would fall to $\frac{F}{M(1+\lambda)}$. In percentage terms, the change in per-minute costs would be $\left(\frac{F}{M} - \frac{F}{M(1+\lambda)}\right) / \frac{F}{M} = \frac{\lambda}{1+\lambda}$. Observe that $\frac{\lambda}{1+\lambda} < \lambda$. In other words, even if, *counterfactually*, all indirect costs were fixed, a given percentage increase in VRS volume would lead to a smaller percentage decrease in per-minute costs. The only way to have per-

³⁸ *Turner Report*, ¶ 22.

³⁹ *Turner Report*, ¶ 23.

minute costs fall by a larger percentage than the increase in the number of minutes is for *total* costs to fall as volume rises.

24. There is no even-remotely-plausible cost function for the VRS industry that has this property. To see why, suppose, counterfactually, that a firm's indirect costs fell as its traffic volume rose. Then an economically rational, low-volume firm should operate the associated company functions *as if* it had high volume. Although it would have excess capacity of these functions, by hypothesis the firm would enjoy lower costs than otherwise. Indeed, by operating in this fashion, the smaller firm would have the same costs as would the larger firm, thus contradicting the counterfactual claim that total—as opposed to average—indirect costs could actually fall with volume.

25. Hence, when Mr. Turner argues that total industry per-minute indirect costs dropped by a larger percentage than the service volume increased and asserts that this is due solely to economies of scale, he is making a claim that is inconsistent with economic rationality and common sense. That is, he is implying total indirect costs (*i.e.*, the aggregate amount, not just the per-minute amount) fell due to an increase in output.⁴⁰ For the reasons just described, a decline in total costs cannot possibly be due solely to the realization of economies of scale.

⁴⁰ For example, suppose a VRS provider served 100,000 minutes per month and had a total indirect cost of \$500,000, yielding an average per minute cost of \$5. An increase in minutes of 8.7 percent coupled with a decrease in per minute costs of 11.3 percent would imply that total indirect costs fell to \$482,085 (a four-percent decline).

See *Katz NPRM Declaration*, ¶ 49 for a discussion of other management improvements that Sorenson has made over time.

26. The likely source of Mr. Turner's error is clear. As I discussed in my initial declaration:⁴¹

... the Commission should be careful not to infer economies of scale from the observation that a provider's average costs have fallen over time as the firm's volume has grown. Instead of economies of scale, the fall in costs may be the result of learning and ongoing innovation.

It also should be recognized that observed costs also could fall due to changes in service quality. Learning, innovation, and changes in service quality very likely all played important roles in explaining the decline in costs. For example, in response to the Commission's 2010 reductions in VRS compensation rates, Sorenson closed VRS centers, increased its interpreter efficiency, reduced headcount associated with training and development, outreach and marketing, field sales activities, technical support, and network infrastructure, and reduced management compensation and overhead.^{42, 43} Of course, these facts do not imply that economies of scale played no role. As discussed in my earlier declaration, the provision of VRS is subject to economies of scale though they are limited.⁴⁴ The critical point is that Mr.

⁴¹ *Katz NPRM Declaration*, ¶ 47.

⁴² *Structure and Practices of the Video Relay Service Program; Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket Nos. 10-51 and 03-123, Sorenson Ex Parte, July 11, 2012, Attachment at at 7.

⁴³ This type of response was not unique to Sorenson. For example, in explaining reductions in SG&A from 2010 to 2011, CSDVRS noted "Due to all the uncertainties going on within the FCC during 2011 (elimination of VARS, Contractors, rate change & potential "pay by customer"), CSDVRS put a freeze on spending the second half of the year. Many stratgic [sic] growth plans were postponed." (CSDVRS Rolka Submission HIGHLY CONFIDENTIAL.xlsx[Economies of Scale].)

⁴⁴ *Katz NPRM Declaration*, § III.B.

Turner's methodology for estimating the size of the economies of scale is fundamentally unsound and contradicted by the facts.⁴⁵

3. Mr. Turner's claims regarding cross-firm comparisons are unfounded.

27. As I discussed in my *NPRM Declaration*, the Commission also must be careful not to confuse the effects of superior management with the effects of economies of scale.⁴⁶ Mr. Turner argues that the fact that Sorenson's costs are significantly lower than those of its smaller rivals cannot be due solely to management decisions and therefore must be due to economies of scale.⁴⁷ Mr. Turner provides no evidence to support this assertion. Rather, as I explained in my *NPRM Declaration*, "there is reason to believe that the causality runs in the reverse direction."⁴⁸ That is, the most efficient firms have the greatest incentives to attract new customers and grow in size.

28. Despite his use of cross-company comparisons to argue that economies of scale are significant, Mr. Turner appears to agree with my critique of such comparisons (*i.e.*, that difference across firms may be driven by factors other than scale). In particular, he states that "the Commission must recognize that there are other, perfectly valid reasons that two different providers may have very different cost structures."⁴⁹ He goes on to note that

⁴⁵ This critique of Mr. Turner's methodology also applies to his discussion of per-minute CA-related costs. (*Turner Report*, ¶ 37.)

⁴⁶ *Katz NPRM Declaration*, § III.B.5.

⁴⁷ *Turner Report*, ¶ 42.

⁴⁸ *Katz NPRM Declaration*, ¶ 46.

⁴⁹ *Turner Report*, ¶ 39.

providers such as Purple and CSDVRS compete on quality and customer service. Although potentially different competitive strategies might result in different cost structures for Purple and CSDVRS, Mr. Turner agrees that “[t]his result is not indicative of an ineffective or uncompetitive industry – rather, it is reflective of a competitive industry in its growth and development where the service has not been commoditized.”⁵⁰

B. CSDVRS’S CLAIMS REGARDING ECONOMIES OF SCALE IN SG&A DO NOT CHANGE THE FACT THAT A SINGLE RATE TIER WOULD PROMOTE COMPETITION AND BENEFIT CONSUMERS.

29. CSDVRS provides numerical estimates of per-minute “SG&A (Indirect) Costs” for a range of VRS output levels and asserts that these costs are subject to significant economies of scale.^{51, 52}

30. In my *NPRM Declaration*, I noted that, although some SG&A costs are fixed with respect to volume, many are not.⁵³ CSDVRS agreed with this observation in earlier comments.⁵⁴ The fact that SG&A costs vary with service volume reduces the degree of economies of scale compared to a situation in which these costs all are fixed.

⁵⁰ *Turner Report*, ¶ 39.

⁵¹ *CSDVRS Comments*, Table 1 and § I.B.

⁵² As discussed above, CSDVRS’s analysis indicates that it does not believe that “CA Related & Non-CA Relay Center Costs” are subject to significant scale economies once a provider reaches a relatively small share of total industry output.

⁵³ *Katz NPRM Declaration*, § III.B.4.

⁵⁴ *Structure and Practices of the Video Relay Service Program and Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Further Notice of Proposed Rulemaking*, CG Docket No.s 10-51 and 03-123, Comments of CSDVRS, LLC, March 9, 2012, at 7 (“But for all providers, big or small, as usage increases, ... more human resources personnel and management must be hired.

31. In my *NPRM Declaration*, I also presented a straightforward mathematical model that demonstrated “any economies of scale in the VRS industry are sufficiently small that multiple providers can operate efficiently.”⁵⁵ To calibrate that model, I used Sorenson estimates of CSDVRS’s and Purple’s traffic volumes as well as data on the growth in Sorenson’s SG&A costs over time.⁵⁶ I reach the same conclusion as I did in my *NPRM Declaration* if I instead calibrate the model using traffic-volume data recently submitted by CSDVRS and Purple as well as the relationship between SG&A costs and provider volume submitted by CSDVRS in response to the *Public Notice*.⁵⁷ In other words, even using CSDVRS’s figures, any economies of scale in the VRS industry are sufficiently small that multiple providers can operate efficiently.

Additional effort must be put into ensuring regulatory compliance, more customer service personnel must be hired, more finance and accounting personnel must be retained, and more engineering personnel are required to maintain the provider’s network up and operational.”)

⁵⁵ *Katz NPRM Declaration*, ¶ 44.

⁵⁶ Specifically, I assumed that fixed administrative expenses account for 41 percent of all administrative expenses. This led to the conclusion that “six equally sized firms could attain per-minute costs just four percent higher than those of a single firm that accounted for 100 percent of VRS volume.” I also presented a robustness check in which I assumed that fixed administrative expenses account for 30 percent of all administrative expenses and showed that “six equally sized firms could attain per-minute costs just three percent higher than those of a single firm that accounted for 100 percent of VRS volume.” (*Katz NPRM Declaration*, ¶ 44 and Technical Appendix.)

⁵⁷ I use data presented by CSDVRS and Purple to infer the number of minutes that they served in 2009. I then apply CSDVRS’s reported SG&A costs to these minutes to estimate the percentage of these indirect costs that are fixed. This exercise implies that fixed administrative expenses account for *****BEGIN HIGHLY CONFIDENTIAL***** percent of all administrative expenses, which is within the range of estimates that I presented previously.

32. Moreover, if other VRS providers believe that economies of scale are particularly important, they are free to expand their operations to take advantage of the higher margins that they predict they would achieve.⁵⁸ As I explained in my *NPRM Declaration*:⁵⁹

It is also important to recognize that scale and cost efficiency are not permanent firm characteristics. Setting a single compensation rate will allow all firms to compete to achieve scale and cost efficiency... by paying a lower marginal price to the most successful firms, the tiered compensation structure reduces the incentives of inefficient, low volume providers to become more efficient and attain higher service volumes.

III. A COMPETITIVE COMPENSATION RATE

33. As I discussed in my *NPRM Declaration*, use of a competitive-bidding process could benefit deaf and hard-of-hearing consumers and improve the efficiency of the VRS program but, because designing an appropriate bidding process is complicated, it would be premature for the Commission to adopt such a process immediately.⁶⁰ However, even if the Commission instead uses an administrative process to set compensation rates, the Commission should set rates that correspond to those that would emerge from the use of a competitive-bidding process.⁶¹ As I explained earlier, such rates would have the following properties: (a) there would be a single rate, which is an approximation to the competitive price; (b) the rate would be set so that it allows the most efficient firms to earn an adequate return on investment; and (c) the rate would allow firms to benefit if they are able to operate more efficiently than are

⁵⁸ Some VRS firms may argue that alleged anti-competitive acts by Sorenson prevent them from expanding. I previously addressed these claims and showed them to be without merit. (*Katz Reply NPRM Declaration*, § III.A.)

⁵⁹ *Katz NPRM Declaration*, ¶ 52.

⁶⁰ *Id.*, § V.A.2.

⁶¹ *Id.*

their rivals.⁶² Specifically, in a process that seeks to fund N service providers in order to facilitate quality competition, the rate would be equal to the cost level of the $N+1^{\text{st}}$ lowest-cost potential service provider.⁶³ If the goal, therefore, were to maintain at least the current number of competitors, the rate would be equal to the cost level of the next firm that would enter, *i.e.*, above the cost levels for all current firms. By mimicking the competitive process, rates adhering to these principles would promote efficiency of the VRS program and benefit consumers by promoting the availability of VRS and encouraging functional equivalence.

34. There is another important implication of the competitive benchmark. A potential bidder would take into account all of the costs of providing service when choosing whether to bid. In the long run, the potential bidder would consider *all* of the costs associated with being in business. These costs would include call center and interpreter costs, marketing and outreach costs, administrative costs (including product management, engineering, customer support, general and administrative, human resources, information technology, and technical support), taxes, and investment costs including principle and interest. If it would be unable to submit a winning bid greater than the average of all of its costs of doing business, then the firm would find it economically rational to shut down rather than to offer VRS to deaf and hard-of-hearing consumers.⁶⁴ Hence, by the principle that administratively set prices should

⁶² *Id.*

⁶³ Because quality is a strategic choice of each service provider, a firm's cost level in this discussion should be understood to refer to the function that relates the firm's cost to its quality level evaluated at the quality level at which the firm will find it optimal to compete.

⁶⁴ Although the Commission seems to have concluded some or all carriers providing voice telephone services could be required to supply VRS, it is clear that Sorenson and other current

mimic competitively determined prices, the calculation of the costs of the $N+1^{\text{st}}$ lowest-cost potential service provider should include all of the costs of being in the business of providing VRS service.

IV. CONCLUSION

35. The *Public Notice* contemplates the adoption of two seriously flawed proposals: (a) the use of government fiat to dictate industry structure, and (b) the use of principles and amounts drawn from rate-of-return regulation to set compensation rates. There is broad agreement among Consumer Groups and VRS service providers that these proposals threaten to distort and eliminate competition, reduce consumer choice, and stifle innovation. If these proposals are adopted, deaf and hard-of-hearing consumers can expect lower quality service and fewer options. The comments submitted in response to the *Public Notice* reinforce my earlier conclusion that the statutory goals of ensuring that VRS is available to all eligible users and offers functional equivalence would be much better served by promoting undistorted competition within a framework of industry-wide interoperability standards and by setting compensation based on incentive-regulation principles.

VRS providers are not required to do so. Moreover, even any carriers that could be forced to provide VRS would have no incentives to provide anything beyond the absolute minimums with respect to availability and quality.

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

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

Michael L. Katz

November 29, 2012