
An Empirical Analysis of Overages on Wireless Consumer Bills

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EXECUTIVE SUMMARY

In its Notice of Proposed Rulemaking (CG Docket 10-207, 25 FCC Rcd 14625 (2010)) released late last year, the Federal Communications Commission recommends the adoption of broad and costly regulations to alleviate a perceived “bill shock” problem. The Commission supports its proposals with its own survey that purports to show that 30 million American consumers “had experienced a sudden increase in their bill that occurred even when they had not changed their calling or texting plan.” As discussed in the following paper, the Commission’s anecdote-based analysis overstates the scope of overages and fails to take into account carrier responsiveness to those customers who do incur unexpected overages.

By contrast, the Nielsen Customer Value Metric panel analyzed more than 65,000 customer bills and determined that very few American consumers are actually “shocked” when they incur overages. Although approximately 13.5% of consumer accounts go into overage at least once a year, nineteen out of twenty of these customers are economically better off than they would have been had they chosen to upgrade to a higher tier price plan. They made the right decision by incurring overages. Indeed, American consumers save between \$882 million and \$2.4 billion per year by creating personalized price plans that combine set monthly fees with “planned” overages. In addition, wireless operators provide credits to customers who incur overages far more often than they do for customers that stay within their monthly limits, further reducing the impact of overages and increasing the incentive to use overages to reduce overall annual cost. Nor does domestic and international roaming or international calling contribute to overages on more than a negligible basis.

In other words, this analysis demonstrates that current rate plan structures result in consumers saving hundreds of millions of dollars each year by custom-tailoring plans to their usage. If the FCC prescribes a one-size fits all approach to customer notifications, it is likely to have the unintended consequence of reducing choice, flexibility, and consumer savings.

INTRODUCTION

This Report offers further analysis of the only objective and empirical data on overages in consumer wireless bills that has been submitted in the FCC's Bill Shock proceeding. On December 20, 2010, the Nielsen Company filed data from its Consumer Value Metrics service, which analyzed bills collected from 78,633 post-paid accounts covering the year beginning in the third quarter 2009 to the end of the second quarter 2010. As such, the Nielsen Study is the only analysis of impartial billing data of post-paid wireless consumers, and shows actual consumer experiences and reactions. The Nielsen Study's examination of *actual* bills distinguishes its research from other surveys cited in this proceeding (including that of the FCC itself) that provided solely consumers' *opinions*.

Contrary to the FCC's portrayal of consumers needing protection from overages, this Report demonstrates that wireless consumers are sophisticated economic participants who optimize their spending and consumption patterns based on the tools available to them. In fact, this Report details how much consumers actually benefit from diversity in price plans, and as a result are able to best control costs through this increasingly flexible marketplace.

Further, the Nielsen Study indicates that many consumers incurring overages do so willfully and repeatedly. Their behavior suggests it is unlikely that usage notifications or usage controls would change their behavior because they are either indifferent to the overage charges or have determined that the occasional overage charge is more economical for them than choosing a more expensive plan. Notwithstanding that these overage-incurring consumers may not want or need additional notifications or controls, the adoption of the FCC's regulatory proposals would impose on all consumers the financial burden of "protecting" this one small group.

THE NIELSEN CUSTOMER VALUE PANEL

The panel in the Nielsen Study of more than 65,000 accounts provides a representative overview of the actual behavior and actions of a broad cross-section of American postpaid wireless consumers.

Consistent panel: The data used in the Nielsen Study are all from the same cohort. Nielsen was able to provide the data by observing the same accounts every month. The total sample figure of 78,633, when compared with the stated goal of more than 65,000, indicated an annual churn in the panel of about 20%, which is entirely consistent with the average annual churn in the wireless industry. By having the same cohort as its basis of observation, the Nielsen Study analysis allows for the kind of longitudinal analysis that is required to adequately observe events and their effects, properly analyze the data, and draw viable inferences.

Ethnicity and gender: In terms of ethnicity, the panel provides a demographic distribution comparable to the U.S. Census data. Since consumers have to pass a credit check to be eligible for a post-paid account, we would expect that some parts of the population would be underrepresented in the sample. Gender distribution matches very closely U.S. Census data, which is again consistent with what we would expect of a representative panel.

Age: The age distribution of account holders is consistent with what we would expect to see in a post-paid panel. Younger age groups are significantly underrepresented because of family plans. In family plans, younger family members are covered on the same plan as their parents, thereby effectively removing them from the pool of account holders. This creates a bias toward older account holders.

Smartphone ownership: The distribution of smartphones versus feature phones is also consistent with the increase in smartphone ownership among Americans and represents a figure that is quite close to the average smartphone ownership during the time period from the third quarter 2009 to the second quarter 2010.

Low income Americans: There is no bias against low-income Americans in the Nielsen study. Low-income Americans are significantly more likely to have prepaid than post-paid plans, however, due to the required credit check before being accepted as a post-paid customer. Therefore, the normal bias in online surveys does not exist here in a meaningful way. Furthermore, it means that low income Americans are less likely to incur bill shock due to their disproportionately low representation among the post-paid customer base.

EMPIRICAL DATA IN THE NIELSEN PANEL DATA

People are shocked by an event that combines three factors: the event is rare, it is unexpected, and it has a significant impact. Most post-paid wireless consumers never experience this combination of factors in their wireless bills. Indeed, the Nielsen Study data reveal that the vast majority of Americans never go into overage. In the course of a year, according to the data, 86.5% of accounts never have a voice overage and 82% never have a data overage.

Below, I discuss how rarely all three factors occur to produce a “shock.”

Voice overages: The Nielsen Study data show that 6.5% of voice accounts went into overage once and 3.3% of such accounts went into overage twice in the year-long period observed. The typical overage for each segment was \$17.89 and \$20.93 respectively. This generally represents about one third of their normal monthly bill. The event might be surprising or inconvenient; but it is unlikely to be shocking.

“[L]ess than *half a percent* of all post-paid customers encounters a charge so high it could be called ‘shocking.’”

Only the 75th percentile - or 1.6% and 0.8% respectively - of accounts that went into overage once or twice during the period observed had overages that were in the magnitude of their wireless bill. These voice overages were \$42.40 and \$43.43 respectively, compared to the average phone bill of about \$59.25 including taxes, fees, *etc.*

One of the most interesting data points from the Nielsen Study concerns the 95th percentile of the 13.5% of accounts that go into overage. The average overage of the 95th percentile of people who exceed their limits once (0.32% of accounts) or twice (0.16%) is \$101.62 and \$92.48 respectively. In other words, less than *half a percent* of all post-paid customers encounters a charge so high it could be called “shocking.” What makes the magnitude of the overage even more remarkable is that these amounts are from domestic overages only. According to the Nielsen Study data, domestic and international overages are quite small, less than one dollar per month regardless of the number of occurrences. Typically, the average and the median are close together in a normally distributed event. Here, the impact of the 95th percentile is so significant that it moves the mean overage amount to \$30.15 and \$30.55 from the median of \$17.89 and \$20.93, which is more than 50% higher than what the typical person (median) pays.

About 3.6% of the accounts that exceed their voice plan limits incur overages three times or more and up to twelve times in a year. For accounts that repeatedly go into overage, it is reasonable to infer that it is a matter of consumer choice. These customers are either indifferent to overages or are making the deliberate decision to incur overages because it is the most cost-efficient solution for their usage patterns. By the same token, it is unreasonable to infer that these customers have no idea the overages are coming considering the event occurs so often.

Clearly, some consumers are engaging in an express trade-off between paying the occasional overage charge and upgrading to a plan that would eliminate the overage but cost them more over the long run. For example, the 25th percentile of accounts that exceed their limits once or twice a year are incurring overage charges of \$6.30 and \$8.10 respectively. If they would upgrade to a higher price plan, they would incur higher charges of at least \$10, but more

typically \$20 per month for the entire year, for a total of \$120 or \$240 respectively to avoid a single or dual occurrence of less than \$10. Consumers are definitely not shocked, but are following a rational path to minimize their wireless expenditures. Only when accounts in the 25th percentile go into overage eight times or more in a year is it rational to spend an additional \$20 a month, which is \$240 per year for a larger bucket of minutes than to incur the overages. In fact, these subscribers would still save money by spending only \$10 a month for a total of \$120 per year to upgrade their bucket of minutes instead of continuing to incur overages.

We will look in more detail at the rational consumer who employs overages to minimize wireless expenditures later in this Report.

Every year wireless carriers send out approximately 1.38 billion bills and, of these, at most 736,000 bills – or 0.053% of all bills issued – contain overages that are significantly higher than the usual monthly charges. Approximately 552,000 accounts have received such a bill. We have to discount these numbers further, since in many cases, customers have knowingly gone into overage and therefore are aware of the consequences of their actions. This leads to the conclusion that voice overages that truly “shock” a consumer are very rare indeed.

Data Overages

The Nielsen Study also provides insights concerning the frequency and severity of data overages. Although more Americans exceed their data plan limits than their voice plan limits, the amounts of the data overage charges are typically less significant than those for voice overages. In total, about 18% of accounts incurred data overages during the year-long period studied. Because of the preponderance of unlimited data plans during this period, however, most of overages were associated with text messaging as opposed to Internet connectivity. The first major carrier to introduce tiered data pricing for smart phones was AT&T, on June 7, 2010, at the very end of the period observed in the Nielsen Study. Consequently, this change had no impact on the data analyzed.

Again, data overages for a typical customer are modest. The median charge for accounts going into data overage once or twice in a year was \$2.00 and \$3.85 respectively. The median overage charge increased to \$7.73 for customers with nine overage incidents in a year, but then dropped to \$6.14 for consumers that incurred overages every month. Even at the 75th percentile of data overage, only accounts that went into overage ten out of twelve months experienced a negative economic impact. It is quite likely that data overages for accounts of the 75th percentile were planned events rather than random, “shocking” occurrences. Only for accounts in the 95th percentile were overages generally in the 50% range of the overall bill. Even more than with voice overages, there are a sizeable number of customer accounts that are repeatedly, almost habitually, going into overage, indicating willful behavior.

“Clearly, some consumers are engaging in an express trade-off between paying the occasional overage charge and upgrading to a plan that would eliminate the overage but cost them more over the long run.”

Billing Credits

The Nielsen Study data on billing credits are indicative of the lenient behavior of wireless carriers toward customers who incur overages. The average customer who never goes into overage receives a monthly credit of about \$6.50 on his wireless bill. The source of these credits range from erroneous purchase of products and services, applications downloaded onto a second device after an upgrade, mistakes made by the carrier, and corporate discounts.

Generally, customers who incur overages receive a larger credit than those who do not. This is valid for both voice overages and data overages, with the exception of accounts that went into voice overage eight times and data overage ten times in the period observed. Because it is safe to assume that customers that incur overages are not more likely to purchase items and services erroneously, re-download applications on different phones, be subject to more carrier errors, or receive greater corporate discounts, we can conclude that carriers provide credits to customers specifically for overage reimbursement. These incremental credits are at least 12% higher than for accounts with no overages. Accounts going into voice overage six times per year receive almost 2 ½ times what consumers receive who never go into overages, or roughly \$16.00, as credit every month, and accounts going into overage twelve times per year receive credits of about \$22. Accounts incurring data overages are seeing consistently higher credits than customers with voice overages—generally 50% to 100% higher than accounts that have never gone into overage.

The Nielsen Study does not subtract the credits discussed above from the documented overage charges. Therefore, these credits represent a significant source of overage reduction not taken into account by Nielsen. The Commission does not take into account carrier credits either.

Domestic and International Roaming and International Calling

The Nielsen filing also reveals interesting data regarding roaming and international calling charges. Several years ago, national wireless operators, responding to customer confusion and dissatisfaction, phased out local and regional calling plans in favor of national plans. As a result, the Nielsen Study data show that consumers today experience virtually no domestic roaming charges. The highest voice roaming charges on a monthly bill are 44 cents for accounts going into overage six times per year. For other accounts, the charge is consistently below 22 cents in the month the overage occurred.

Wireless phones in the U.S. are by default disabled from being used outside the country. Customers have to request international usage ability from their carriers, at which point they are given the option to sign up for an international roaming plan (with heavily discounted rates for voice, messaging, and data connectivity) for a monthly pro-rated subscription fee, or to pay full price without the monthly subscription. Voice calling is then charged by the minute, and some operators offer international messaging and data connectivity bundles while others charge by the message or kilobyte of data. Only activity above the established package is considered overage by Nielsen. Customers are generally able to sign up and cancel these international plans at any given point without penalties.

International calling overage charges are also low, with the highest average charge observed for customers going into overage eight times per year of 47 cents in the relevant month. Here again, consumers are making the most beneficial economic decision for themselves. We can only conclude from the data that customers who regularly call internationally are using cost efficient ways not to incur overage charges with their mobile operator.

Consumer Benefits of Overages

In past years, one of the most frequent consumer complaints about shopping for wireless service was the excessive number of rate plans and the difficulty of picking the right one. Wireless carriers responded to customers' concerns and simplified their rate plans, reducing both the number of plans available and the pricing increments within those plans.

At the time of this Report, operators employ a good, better, best approach for wireless voice with three options as provided in Table 1. The increment between the good and better levels is \$20, and \$10 from better to best, for AT&T, Sprint and Verizon Wireless. For T-Mobile, the level increment is \$10. The associated amount of minutes varies among the carriers, but the best level usually offers unlimited voice calling.

Table 1: Voice Price Plans

	\$39.99	\$49.99	\$59.99	\$69.99
AT&T	450		900	Unlimited
Sprint	450		900	Unlimited*
T-Mobile	500	1,000	Unlimited	
Verizon Wireless	450		900	Unlimited

* Unlimited mobile to mobile, 450 landline minutes, unlimited voice, data, messaging at \$99.99

There is more variation among the carriers with regard to data plans. The desire to differentiate themselves sharply from each other is a sign of healthy competition. For example, T-Mobile offers only unlimited text messaging and the difference between 200 MB of data and unlimited data usage is \$20, with the basic 200 MB plan starting at \$10. Sprint offers unlimited text messaging for \$10 and, for an additional \$20, consumers can add unlimited data and unlimited mobile-to-mobile calling to their plans. AT&T provides 1,000 text messages for \$10 and unlimited text messaging for \$20. For data connectivity, AT&T offers two options, 200 MB for \$15 and 2 GB for \$25. Verizon Wireless offers three texting options: \$5 for 250 text messages, \$10 for 500 text messages, and \$20 for 5,000 messages. As a reference, 5,000 messages is 10 messages per hour every day per month, assuming one is awake for 16 hours per day. Verizon's data pricing depends on the type of device used, with feature phone customers charged \$1.99 per MB or \$10 per 75 MB and unlimited usage for \$29.99.

The drawback of simplicity, which is something that consumers were clamoring for, is the increased likelihood of consumers having mismatches between their actual usage and the available bundles. For the vast majority of customers, the bundles work well, as they incur no overages while enjoying financial predictability. Other customers choose prepaid service as a viable option, with prices often on par with post-paid plans. A third category of consumers is making the deliberate choice to incur overages a few months per year because the annual cost of overages is below the cost of moving to a higher price plan. For most operators, the break-even point for making the change from the good to better product is \$240 per year; for T-Mobile \$120; the change from the better to best package for all national carriers has a breakeven point of \$120 per year.

Table 2

Overages per month

Occurrences	Distribution	n	95 th %ile	75 th %ile	Median	25 th %ile	Mean
0	86.50%	68056					
1	6.50%	5085	\$101.62	\$42.40	\$17.89	\$6.30	\$30.16
2	3.30%	2627	\$92.48	\$43.43	\$20.93	\$8.10	\$30.55
3	1.60%	1238	\$91.89	\$45.30	\$25.20	\$10.35	\$32.00
4	1.00%	811	\$91.80	\$44.10	\$22.05	\$8.89	\$30.59
5	0.40%	327	\$76.83	\$46.80	\$28.18	\$16.63	\$33.32
6	0.20%	162	\$92.43	\$52.20	\$29.25	\$16.20	\$37.43
7	0.10%	92	\$69.27	\$42.43	\$25.97	\$11.46	\$29.92
8	0.10%	115	\$100.13	\$53.10	\$29.25	\$10.40	\$37.64
9	0.00%	38	\$62.24	\$35.85	\$28.20	\$15.90	\$28.14
10	0.00%	20	\$63.14	\$49.76	\$27.62	\$17.01	\$31.63
11	0.00%	1	\$1.42	\$1.42	\$1.42	\$1.42	\$1.42
12	0.10%	61	\$77.07	\$47.23	\$24.80	\$11.33	\$31.51

Source: The Nielsen Company, FCC Filing from December 20, 2010

Total overage per year

Occurrences	Distribution	n	95 th %ile	75 th %ile	Median	25 th %ile	Mean
0	86.50%	68056					
1	6.50%	5085	\$101.62	\$42.40	\$17.89	\$6.30	\$30.16
2	3.30%	2627	\$184.96	\$86.86	\$41.86	\$16.20	\$61.10
3	1.60%	1238	\$275.67	\$135.90	\$75.60	\$31.05	\$96.00
4	1.00%	811	\$367.20	\$176.40	\$88.20	\$35.56	\$122.36
5	0.40%	327	\$384.15	\$234.00	\$140.90	\$83.15	\$166.60
6	0.20%	162	\$554.58	\$313.20	\$175.50	\$97.20	\$224.58
7	0.10%	92	\$484.89	\$297.01	\$181.79	\$80.22	\$209.44
8	0.10%	115	\$801.04	\$424.80	\$234.00	\$83.20	\$301.12
9	0.00%	38	\$560.16	\$322.65	\$253.80	\$143.10	\$253.26
10	0.00%	20					
11	0.00%	1					
12	0.10%	61	\$924.84	\$566.76	\$297.60	\$135.96	\$378.12

Total overage per year

Overage exceeds \$240

Overage exceeds \$120

Overage below \$120

In Table 2 above, both the source data from the Nielsen Study and a table showing the annualized overages for each occurrence, distribution, and mean is provided. I have color-coded the annual average amount, with green indicating overages below \$120, blue indicating overages between \$121 and \$240, and yellow indicating overages of \$241 and above. The blue and green cells show that customers who are with carriers that have a \$20 step between price plans have made the right economic decision to have incurred overages rather than to have subscribed to a higher price plan. The green cells indicated that it was the right decision not to take a \$10 step up. Based on this analysis, only 0.3% to 0.5% of accounts (the sum of accounts in yellow cells in Table 1) are actually worse off by going into overage than they would have been with a higher price plan. This represents only 345,000 to 575,000 accounts that are economically worse off by going into overage. We have to estimate this number because of the lack of granularity in the 95th to 100th percentile of the data given. In any case, we are talking about an extremely small percentage of wireless post-paid users.

Indicated in Table 3, the mismatches between actual usage and price plans are usually quite small. The overage translated in minutes is less than the amount of minutes provided by choosing a plan with more minutes attached to it. Accounts that incur heavy overages would generally be better served by a higher price plan, which carriers as a rule offer to such customers (even retroactively in most circumstances).

Table 3:

Voice Overage translated into Minutes at \$0.45 per minute							
Occurrences	Distribution	n	95 th %ile	75 th %ile	Median	25 th %ile	Mean
0	86.50%	68056					
1	6.50%	5085	226	94	40	14	67
2	3.30%	2627	206	97	47	18	68
3	1.60%	1238	204	101	56	23	71
4	1.00%	811	204	98	49	20	68
5	0.40%	327	171	104	63	37	74
6	0.20%	162	205	116	65	36	83
7	0.10%	92	154	94	58	25	66
8	0.10%	115	223	118	65	23	84
9	0.00%	38	138	80	63	35	63
10	0.00%	20					
11	0.00%	1					
12	0.10%	61	171	105	55	25	70

It is important to trust consumers to make rational economic decisions. There is substantial evidence that consumers make deliberate choices to incur overages rather than upgrading to a more expensive monthly rate plan, and that they overwhelmingly benefit from such choices.

As demonstrated in Table 3, a simple upgrade from one voice level to the next would have easily eliminated the overage and the wireless operator would have generally made the change retroactively. Such an upgrade costs either \$10 or \$20 and would have avoided what the FCC calls “bill shock.” Nevertheless, 7% of accounts persisted in engaging in overages more than once. For these customers, it is in their economic self-interest to continue to incur overages. 13.5% of wireless customers incurred voice overage charges during the course of the year studied, but 13.0% of wireless customers (about 19 out of 20 accounts who went into

voice overage) made the most economically beneficial choice by incurring the excess charges instead of paying an extra \$10 per month for a higher rate plan, and 11.8% made the correct economic decision to incur overages instead of upgrading at \$20 per month. Through a strategic combination of rate plans and occasional overages, consumers saved between \$882 million and \$2.4 billion in just one year. The \$882 million figure is based on a \$10 upgrade and the \$2.4 billion is based on a \$20 upgrade, by subtracting the annual cost of the upgrade from the annual amount of the overages multiplied by the number of incidents.

Most other analyses of overages have simply focused on the overage charges that consumers incurred, but have forgotten that the consumers also received services for which the carrier is entitled to compensation. This Report is the first analysis that takes into account both overage costs to the consumer and the actual benefits the consumer derives through choosing to incur those charges instead of upgrading his or her rate plan.

CONCLUSION

The Nielsen Study contains the most comprehensive data available regarding the causes and effects of overages on wireless bills.

The analysis shows that American consumers make sophisticated economic decisions that benefit them fiscally. As counterintuitive it may be for an outside observer, there are many cases in which it makes financial sense for a customer to go into overage once, twice, five, and even ten or twelve times in a year. Some customers value predictability over the lowest possible cost, others strategically match a low rate plan with calculated overages to achieve additional savings. They are not shocked – they planned it that way.

In fact, only 0.3% of wireless accounts go into overage during a year by such an amount that the customer would have been better off having upgraded their plan for that year. The other 99.7% of post-paid consumers are better off with their current price plans than they would have been had they chosen plans that would have eliminated their overages. Furthermore, most, if not all, carriers usually offer to implement a retroactive upgrade, eliminating the overage charges without costly regulatory mandates.

This Report provides strong evidence that consumers, especially those who repeatedly go into overages, are effectively creating their own price plans. In many or most cases, significant overages are addressed promptly by carriers responding to customer inquiries. It would be an unfortunate unintended consequence if FCC policy actually reduced the amount of consumer choice and flexibility in rate plans and overage notifications by prescribing a one-size fits all approach.

“99.7% of post-paid consumers are better off with their current price plans than they would have been had they chosen plans that would have eliminated their overages.”

COMPANY OVERVIEW

Recon Analytics LLC is a research and consulting firm located in Dedham, Massachusetts. The company was founded in January 2011 by Roger Entner, who is its principal analyst. Immediately prior to founding Recon Analytics LLC, Roger was Senior Vice President, Research and Insights, for the Telecom Practice of The Nielsen Company. In the two years he held that position, Roger was responsible for thought leadership and advancing the research agenda and positioning for telecom at the company. For the two years prior to that, Roger was Senior Vice President, Communications Sector, for IAG Research, and after IAG Research's acquisition by The Nielsen Company, for Nielsen IAG. At Nielsen IAG, he was responsible for providing telecommunications companies with insights around advertising effectiveness. From 2004 to 2007, Roger was Vice President, Telecoms, for Ovum, where he was responsible for all research provided for the telecom industry in North America. From 2001 to 2004, Roger was Director, Wireless/Mobile Services for the Yankee Group, where he oversaw research regarding U.S. mobile operators.

Roger Entner has an MBA from George Washington University in Washington DC and a BA from Heriot-Watt University in Edinburgh, Scotland.