Loyola Consumer Law Review

Volume 19 | Issue 1 Article 3

2006

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Introduction

The Federal Communications Commission's (FCC) promulgation of wireless "truth-in-billing" rules in 2005 was intended to increase the price transparency of wireless phone plans. The rules require wireless phone companies to disclose up-front an estimate of taxes, regulatory fees, and other charges that have traditionally been added to the price of the calling plan after the subscriber signs up and starts receiving bills.[1] Although the rules may increase price transparency, add-on charges create other significant hidden costs to consumers and society that truth-in-billing fails to reveal. These costs consist of value that consumers and producers forego because taxes, universal service contributions, and regulatory charges increase the price of wireless service, prompting consumers to purchase less. Economists call such costs "deadweight losses."[2] Ironically, by making add-on charges more transparent, truth-in-billing tends to increase these hidden costs, because consumers are more likely to reduce their consumption of wireless services when add-on charges are more transparent. This is not, of course, an argument against transparency, but rather an indication that truth-in-billing by itself fails to make all of the social costs of add-on charges fully transparent.

For this reason, truth-in-billing should be viewed as merely a first step in making the full costs of add-on charges more transparent to wireless users. The next step would be for regulators to acknowl-

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[1] Truth-in-Billing and Billing Format; National Association of State Utility Consumer Advocates' Petition for Declaratory Ruling Regarding Truth-in-Billing, 20 F.C.C.R. 6448 (2005) [hereinafter *Second Report and Order*].

[2] DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 105 (2d ed. 1994).

edge publicly the size of the deadweight losses and pursue policy reforms to mitigate them. Reducing the hidden costs requires other policy changes in addition to truth-in-billing, and a variety of such proposals are under consideration by regulators and policymakers.

This Article assesses the effects of truth-in-billing and a number of proposed policy initiatives affecting both the explicit and hidden costs of add-on charges. Part I describes the impetus for the FCC's 2005 wireless truth-in-billing rules. Part II discusses the economic theory implicit in the FCC's decision. Part III outlines the explicit costs of add-on charges. Part IV calculates the hidden effects on consumer and producer welfare. Part V examines the effects of various proposals intended to reduce the hidden costs of add-on charges.

I. The Truth-in-Billing Initiative

The Telecommunications Act of 1996 (the Act) significantly opened telecommunications markets to competition and thereby facilitated the introduction of new telecommunications services.[3] However, some new problems emerged for consumers. Unscrupulous competitors engaged in unethical business practices such as "slamming"[4] and "cramming."[5]

A. The 1999 Truth-in-Billing First Report and Order

The first Truth-in-Billing Report and Order in 1999 implemented three principles, under the authority granted to the FCC under § 201(b) of the Act[6], in an attempt to curb the efforts of fraudulent service providers and clarify telephone bills. First, telephone bills must be clearly organized and must identify the service provider and any new service providers (usually providers of long distance). Second, bills must contain clear descriptions of charges. Lastly, bills must contain information about how consumers can inquire and con-

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[3] Truth-in-Billing and Billing Format, 14 F.C.C.R. 7492, ¶ 2 (1999) [hereinafter *First Report and Order*].

[4] *Id.* ¶ 3 n.4 (defining *slamming* as "when a company changes a subscriber's carrier selection without that subscriber's knowledge or explicit authorization").

[5] *Id.* (defining *cramming* as "the practice of causing unauthorized, misleading, or deceptive charges to be placed on consumer' telephone bills").

[6] 47 U.S.C. § 201(b) (2000 Suppl. 2) (providing that "[a]ll charges, practices, classifications, and regulations for and in connection with such communication service, shall be just and reasonable, and any such charge, practice, classification, or regulation that is unjust or unreasonable is declared to be unlawful...").

test charges.[7]

These three principles, as well as their accompanying guidelines,[8] were primarily intended for wireline carriers. The principles were broad and flexible so as to "afford carriers the freedom to respond to consumer and market forces individually" and to "consider whether to include these charges as part of their rates, or to list the charges in separate line items."[9]

The 1999 Truth-in-Billing Report and order only held wireless carriers (or Commercial Mobile Radio Service (CMRS) carriers) to two principles. These two principles were variations of the first and third principles enumerated for wireline carriers, and are as follows: (1) that the name of the service provider associated with each charge be clearly identified on the bill; and (2) that each bill should prominently display a telephone number that customers may call free-of-charge in order to inquire or dispute any charge contained on the bill.[10]

The commission also stated that it intended wireless carriers to adopt the "standardized labels for charges resulting from Federal regulatory action, if and when such requirements are adopted."[11]

Wireless carriers were held to a lesser standard because the record did not reflect the same volume of complaints.[12] Furthermore, some of the rules were simply inapplicable to wireless carriers, because they are not subject to equal access obligations and hence would not need to indicate a new long distance provider on consumers' phone bills.[13] After implementing these basic rules, the FCC sought further comment on what rules wireless carriers should actually be held to—presumably in an effort to allow the market for cellular telephone service to further develop.[14]

B. The NASUCA Petition

The Truth-in-Billing docket remained inactive for more than four years until the National Association of State Utility Consumer

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[7] *First Report and Order*, *supra* note 3, ¶ 5 (1999).

[8] *Id.* ¶¶ 28-67.

[9] *Id.* ¶ 55.

[10] *First Report and Order*, *supra* note 3, ¶ 17 (1999).

[11] *Id.* ¶ 18.

[12] *Id.* ¶¶ 16, 69.

[13] *Id.*

[14] *Id.* ¶¶ 68-70 (1999).

Advocates (NASUCA) petitioned the FCC for a declaratory ruling regarding the Truth-in-Billing rules on March 30, 2004.[15] NASUCA claimed that consumers "shop among carriers based on the lowest monthly and usage-based rates for the telecommunications service offered . . ." rather than on the total monthly bill, and hence, "do not consider the myriad fees and surcharges that also apply."[16] NASUCA also claimed that carriers do not make information regarding fees and surcharges readily available to consumers until after they receive their first bill and are already locked into a contract.[17] Based on these assumptions regarding consumer knowledge and behavior, NASUCA argues that "inefficient carriers can hide their inefficiencies . . . because they are not punished by the competitive market."[18]

In response to regulatory compliance surcharges that wireless carriers were including on the bill,[19] NASUCA asked the FCC to prohibit carriers from "imposing line items *unless those charges are expressly mandated by federal, state or local regulatory action.*"[20] Further, NASUCA asked the FCC to require such line items to closely match the regulatory assessment.[21]

C. The 2005 Truth-in-Billing Second Report and Order

The FCC responded to NASUCA's petition for a declaratory ruling with the *Second Report and Order* on March 10, 2005.[22] The *Second Report and Order* had two primary functions. First, the FCC required wireless carriers to adhere to the same truth-in-billing rules that originally applied to wireline carriers. Specifically, the FCC required billing descriptions to be brief, clear, non-misleading, and in

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[15] National Association of State Utility Consumer Advocates' Petition for Declaratory Ruling 1 n.1 (Mar. 30, 2004) (unpublished manuscript) [hereinafter *NASUCA Petition*] *available at* http://www.nasuca.org/TIB%20Petition%203-25%20Clean.doc. (NASUCA is a voluntary, national association of 44 consumer advocates in 42 states and the District of Columbia, organized in 1979. NASUCA's members are designated by the laws of their respective states to represent the interests of utility consumers before state and federal regulators and in the courts.").

[16] *Id.* at 11.

[17] *Id.* at 11 n.21.

[18] *Id.* at vii.

[19] *See id.* at 10-11, 17-22, 44-57.

[20] *NASUCA Petition*, *supra* note 15, at 11 n.21.

[21] *Id.*

[22] *Second Report and Order*, *supra* note 1.

plain language.[23] In applying the same rules, the FCC reiterated that non-misleading line item charges are permitted, but that discretionary charges are not to be labeled "in any manner that suggests such line items are taxes or charges required by the government."[24] Second, and more controversially, the FCC prohibited the states from regulating wireless line item charges.[25]

The Second Further Notice of Proposed Rulemaking (NPRM) portion of the declaratory ruling tentatively concluded that if wireless carriers were going to list line item charges on bills, they must list government mandated charges separately.[26] The FCC further tentatively concluded that carriers must disclose the full rate of service, including "non-mandated line items and a reasonable estimate of government mandated surcharges," prior to the consumer's signing of any contract for services.[27] The FCC sought further comment on these, and a variety of other issues, including what the distinction should be between regular and government mandated charges and whether it is reasonable to combine regulatory charges into a single line item.[28]

II. Truth-in-Billing: Evidence and Economic Theory

> *"Rulemaking requires evidence that can be projected to an entire industry. Clear theories on why a practice is illegal and why the proposed remedy is necessary and likely to be effective are also essential."*[29]
>
> –Timothy J. Muris, former Federal Trade Commission Chairman and former Director, FTC Bureau of Consumer Protection

To ensure that regulation genuinely promotes consumer welfare, it should be based on systematic evidence of a widespread problem and a coherent theory explaining why the problem occurred and how the regulation will solve it.

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[23] *Id.* ¶ 1 (citing 47 C.F.R. § 64.2401(b) (2006)).

[24] *Id.*

[25] *Id.* (citing 47 U.S.C. § 332(c)(3)(A) (2006)).

[26] *Id.* ¶¶ 39.

[27] *Second Report and Order*, *supra* note 1, ¶¶ 55-56.

[28] *Id.* ¶¶ 40-48.

[29] Timothy J. Muris, *Rules Without Reason: The Case of the FTC*, 6 REG. 20, 25 (1982).

A. The Evidence

The NASUCA petition does not cite any evidence to support a claim of consumer confusion. Rather, the NASUCA petition infers that there is a problem simply because carriers are increasing their line item charges.[30] Consumers seem to need protection because they either "know nothing," or have been "misled or confused" by wireless carrier billing practices.[31]

The FCC largely provides anecdotal evidence of consumer confusion. First, the FCC states that consumer wireless billing complaints grew from a few dozen in 1999, to 18,000 in 2004.[32] The FCC does not state, however, what those complaints were specifically about. Instead, the FCC simply notes that complaints in the categories of "billing and rates" and "marketing and advertising" constituted most of the complaints against wireless providers in 2003.[33] Secondly, the FCC cites several comments from various state utility commissions that supplied anecdotal evidence of "considerable consumer confusion regarding telephone bills and even possible abuse of line item charges."[34] Most notably, the Iowa Utilities Board commented on how difficult it is to know that charges are recovering what they purport to be recovering, and how this obscures consumer cost-based comparisons of competing carriers, while the Texas Office of the Attorney General commented that line items seem to recover regular operating costs instead of "regulatory" or "administrative" costs.[35]

B. The Economic Theories

Interestingly enough, neither NASUCA nor the FCC cite an economic theory of consumer behavior or rationality that might explain why consumers lack adequate information about the total cost of wireless service. It would seem, however, in attempting to prescribe rules that expand some notion of consumer sovereignty by limiting wireless carriers' suspect billing practices, NASUCA and the FCC assume bounded rationality. Bounded rationality, as its name

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[30] *See NASUCA Petition*, *supra* note 15, at 10-11.

[31] *Id.* at 12.

[32] *Second Report and Order*, *supra* note 1, ¶ 16.

[33] *Id.* ¶ 16 n.47.

[34] *Id.* ¶ 24.

[35] *Id.* ¶ 24 n.65.

implies, assumes that consumers are "procedurally" rational.[36] This is an extension of the major background rule in neoclassical economics that assumes consumers are "substantively" (or at least unboundedly) rational.[37]

1. Neoclassical Rationality

Neoclassical rationality ("substantive" or "objective" rationality) largely ignores the limitations of the human mind.[38] Instead, it considers human behavior to be optimally adapted to the constraints from the *external* situation only.[39] People are rational in that they make "optimal" choices—i.e., their choices always maximize their expected utility.[40] (This of course assumes a "utility function" that consists of "stable and coherent preferences."[41])

In our case, the implications of neoclassical rationality are straightforward: it would not matter if carriers have add-on charges, or even different add-on charges. If the information exists in the market, which it does, consumers will take it into consideration and make a choice that maximizes their utility.[42] In other words, neoclassical models assume that consumers will choose the best basket of services for the total price ("plan price" + taxes + regulatory charges), regardless of how the charges are presented on the bill.[43]

2. Bounded Rationality

Bounded rationality operates under the premise that the human mind's capacity for solving complex problems is quite small

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[36] *See* Herbert Simon, *Human Nature in Politics: The Dialogue of Psychology with Political Science* 79 THE AM. POL. SCI. REV. 293, 294 (1985).

[37] *See id. See also* John Conlisk, *Why Bounded Rationality?* 34 J. ECON. LITERATURE 669, 672 (1996) (providing an excellent review of the studies done by psychologists and experimental economists that demonstrate the limits of rationality).

[38] *See* Simon, *supra* note 36, at 294.

[39] *See id.*

[40] *See id.* at 296.

[41] Matthew Rabin, *Psychology and Economics*, 36 J. ECON. LITERATURE 11, 11 (1998) (providing an excellent review of the literature that critiques neo-classical rationality).

[42] *See NASUCA Petition*, *supra* note 15, at 11 n.21.

[43] *Id.*

compared to the size and complexity of the problems it faces.[44] People are rational in that they have rational procedural mechanisms for making decisions.[45] Proponents of bounded rationality argue that individuals make decisions "using adaptive rather than rational expectations;" they use heuristics or "rules of thumb."[46] "Rules of thumb" are cheap solutions to complex decisions that avoid deliberation costs.[47] A not unreasonable rule of thumb for a consumer purchasing wireless service might be to assume that the plan price publicized by the wireless company is in fact the true price.

The truth-in-billing initiative seems to be an attempt at correcting systematic errors that may be caused by bounded rationality. For instance, the NASUCA petition claims that consumers remain largely ignorant of the actual costs of taxation and regulatory charges associated with mobile telephone service at the time of purchase.[48] Instead, consumers primarily make their purchasing decisions based upon the plan price (including data service offerings, area coverage, customer service ratings, service quality, etc.) as opposed to the total cost of mobile telephone service ("plan price" + taxes + regulatory charges).[49] NASUCA further claims that wireless carriers inflate their add-on charges because of this information asymmetry. Simply put, there is no basis with which to compare the actual costs of regulatory compliance to the carrier's revenues from add-on charges.[50] By the time consumers become aware of the extra charges, it is too late because they face high switching costs, such as the cost of a new mobile phone for another network and a contract period of one to two years.[51]

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[44] *See* Herbert A. Simon, MODELS OF MAN: SOCIAL AND RATIONAL 198 (John Wiley and Sons 1957) (1957); *see generally* Herbert A. Simon, 1 MODELS OF BOUNDED RATIONALITY: ECONOMIC ANALYSIS AND PUBLIC POLICY (John Wiley and Sons 1982) (1982); Herbert A. Simon, 2 MODELS OF BOUNDED RATIONALITY: ECONOMICS AND BUSINESS ORGANIZATION (MIT Press 1982) (1982).

[45] *See* Simon, *supra* note 36, at 294.

[46] *See* Conlisk, *supra* note 37, at 670.

[47] *See id.*

[48] *See NASUCA Petition*, *supra* note 15, at 11.

[49] *Id.* This is not to say that consumers do not eventually discover what those charges are; consumers are almost certain to become aware of tax rates and regulatory charges, and likely resent them, once they receive their first bill. The high volume of complaints received by the FCC and State utility boards seems to bear this out.

[50] *Id.*

[51] *See A Conversation on Wireless Local Number Portability: Video Updated*,

Although the FCC did not strike all add-on charges as NASUCA wished, it did seem to buy the argument that consumers do not have enough up-front information.[52] The FCC required that carriers disclose the total cost of service prior to the consumer's signing of any contract for services.[53]

If rationality is bounded, this would only solve the problem insofar as consumers make cost-based comparisons of "full-disclosure" rates across carriers. A carrier seeking to hide the add-on charges would instruct its marketing personnel to wait as long as possible before disclosing them. The carrier would disclose the full cost of service before concluding negotiation, but often after the consumer had already decided to purchase a particular bundle of services. It is doubtful that consumers reach that critical phase of negotiation with multiple carriers, and therefore the FCC's new "full-disclosure" requirement may do little good. A consumer considering one company's service offering could remain largely ignorant of other carriers' add-on charges.

In summary, the FCC's order appears to be based largely on anecdotal evidence of consumer problems with add-on charges, and the FCC articulated no economic theory explaining why there is a problem or how the regulation will fix it. The economic theory of bounded rationality, though not mentioned by the FCC, could explain why consumers lack adequate information about the size of add-on charges. That same theory, however, suggests that the disclosure regulation may not solve the problem.

(Federal Communications Commission Nov. 11, 2003)(noting that individuals switching between wireless providers will also have to change phones, due to differences in technology used by the different providers) *available at* http://wireless.fcc.gov/wlnp/WLNP-video-transcript.pdf.; *see generally*, Paul Klemperer, *Competition When Consumers Have Switching Costs: An Overview With Applications to Industrial Organization, Macroeconomics, and International Trade*, 62 REV. ECON. STUD. 515, 517-518 (1995); Alan Beggs & Paul Klemperer, *Multi-Period Competition with Switching Costs*, 60 ECONOMETRICA 651 (1992); Paul Klemperer, *Price Wars Caused by Switching Costs*, 56 REV. ECON. STUD. 405 (1989); Paul Klemperer, *Welfare Effects of Entry Into Markets with Switching Costs*, 37 J. INDUS. ECON. 159 (1988); Paul Klemperer, *Markets with Consumer Switching Costs*, 102 Q. J. ECON. 357 (May 1987); Paul Klemperer, *The Competitiveness of Markets with Switching Costs*, 18 RAND J. ECON .138 (Spring 1987); Paul Klemperer, *Entry Deterrence in Markets with Consumer Switching Costs*, 97 THE ECON. J. 99 (Supplement: Conference Papers 1987); Barton L. Lipman & Ruqu Wang, *Switching Costs in Frequently Repeated Games*, 93 J. ECON. THEORY 149 (2000); Oz Shy, *A Quick-and-Easy Method for Estimating Switching Costs*, 20 INT'L J. INDUS. ORG. 71, (2002).

[52] *Second Report and Order*, *supra* note 1, at 6477.

[53] *Id.*

III. Adding Up the Add-on Charges

Much has been made of the differences between the original NASUCA proposal and the regulation the FCC actually adopted. When NASUCA petitioned the FCC for a truth-in-billing regulation, it asked the FCC to ban all add-on or line item charges that were not expressly mandated by government regulatory action.[54] Under this proposal, wireless firms could treat only taxes, and perhaps universal service contributions, as add-on charges. Carriers would have been forced to price their calling plans to cover the costs currently covered by add-on regulatory charges. Instead, the FCC decided to permit add-ons not mandated by government as long as they are disclosed before the consumer signs the contract.[55]

All FCC commissioners agreed that explicitly applying the truth-in-billing rules to wireless carriers was a good thing. However, two commissioners dissented in part to the decision because they claimed the rules did not go far enough to protect consumers. [56] Commissioner Adelstein stated that the newly applied rules would be largely ineffective because the "FCC's current truth-in-billing rules have not been the basis for a single Notice of Apparent Liability in the six plus years they have been in effect."[57] In other words, it does not seem to matter that the FCC has applied the rules from the 1999 Order to wireless carriers, because those rules have largely been unenforced. In addition, Adelstein argued that the FCC should have specified which kinds of line item charges are and are not permitted, noting that the Order "does not address which line items should be permitted and whether there are any practical limits to the amount of charges that can be added on above the advertised price."[58]

At first glance, the difference between the NASUCA proposal and the FCC's regulation might seem to have a significant effect on consumers. Add-on charges account for a noticeable portion of wireless phone bills. In 2004, wireless phone revenues averaged $600 per subscriber.[59] Add-ons averaged an additional $110 per subscriber per

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[54] *See NASUCA Petition*, *supra* note 15, at vii.

[55] *Second Report and Order*, *supra* note 1, ¶ 16.

[56] *Id.* at 54-57.

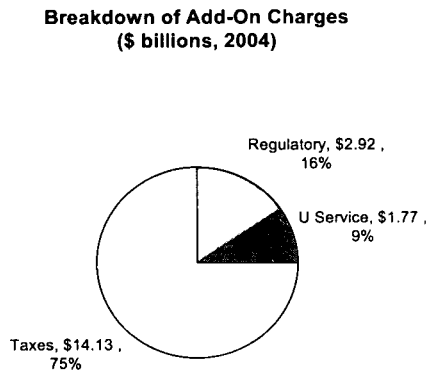
[57] *Id.* at 56.

[58] *Id.*

[59] *See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993;* Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, 20 F.C.C.R. 15908, 89 tbl.9 (2005) [hereinafter *Tenth Report*] (for data used to calculate the average yearly bill; aver-

year, or $9.20 per month, for a total of $18.8 billion.[60] Add-on charges thus accounted for about 15.5 percent of the average wireless bill. If wireless companies could "hide" these charges from the consumer until the consumer was locked into a service contract, many consumers might regret their decision to subscribe to wireless, because they would not have done so had they known the true cost. Similar reasoning would apply to consumers who purchased a more expensive wireless plan than they would have had they known the true cost.

A few simple calculations, however, show that the original NASUCA proposal would have reduced add-on charges by only a modest amount compared to the FCC's order. Three principal kinds of costs comprise add-on charges: federal and state taxes, universal service contributions, and regulatory charges. The pie chart shows each category as a percentage of total add-ons. Federal and state taxes comprise the lion's share of add-on charges anyway, and they could be treated as add-ons under either the NASUCA proposal or the order actually adopted by the FCC.



A. Taxes

Federal and state taxes averaged 13.74 percent in 2004 [61], accounting for by far the largest share of add-ons. These taxes took an

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age bill for 2004 is 12 x $50.28, the average monthly bill for 2004).

[60] *See infra* Part III.A-C, for calculation methods and data sources.

[61] *See* Scott Mackey, *The Excessive State and Local Tax Burden on Wireless Telecommunications Service*, 33 ST. TAX NOTES 181, 184 tbl. 2 (2004) (for weighted average figure).

estimated $14 billion from wireless subscribers in 2004.[62] Three percentage points comprise the federal excise tax on telecommunications services. The remaining 10.74 percentage points are the weighted average state and local taxes on wireless telecommunications. This figure includes both taxes and state regulatory surcharges, such as contributions to state universal service funds.[63]

B. Universal Service Contributions

FCC regulations require universal service "contributions" from providers of interstate and international telecommunications services to subsidize basic phone service for low-income customers, subsidize high-cost phone companies, provide reduced-price Internet service to schools and libraries, and offer reduced-price telecommunications services to rural health care facilities. Providers typically pass these charges through to consumers on their bills.

The federal government spent approximately $5.4 billion on these universal service programs in 2004.[64] About 64 percent of this money—$3.5 billion—went to subsidize high-cost carriers, and $759 million (14 percent) was spent on programs for low-income customers that help pay initial connection charges (Linkup) and subsidize monthly phone bills (Lifeline). Most of the rest ($1.2 billion, or 22 percent) subsidized internal wiring, telecommunications, and Internet service to schools and libraries.[65] The wireless industry's universal service contributions totaled approximately $1.8 billion in 2004.[66]

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[62] *See id.* (for the weighted average tax rate used in calculating 2004's wireless taxation burden (multiplying the weighted average tax rate of 13.74 percent x average wireless revenues per minute (9.22 cents) x 1.12 trillion minutes of wireless usage in 2004)). *See also Tenth Report*, *supra* note 59, at tbl. 9 (reporting revenues per minute and minutes of use used in calculation).

[63] *See id.* at 184 tbl.2.

[64] *See 2005 Trends in Telephone Service*, FED.COMM. COMMISSION REP., 19-5 tbl.19.1 (May 2005), [hereinafter *2005 Telephone Service Trends*], *available at* http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend605.pdf.

[65] *See id.*

[66] *See id.* at 19-22, tbl.19.17 (reporting that wireless carriers accounted for 32.6 percent of universal service funding in 2004; multiplying that percentage x $5.4 billion in universal service spending yields approximately $1.8 billion).

C. Regulatory Charges

Regulatory charges ostensibly reimburse wireless companies for a variety of costs they bear to comply with regulations that compel consumers to purchase certain types of features or compel companies to build certain functionalities into their networks. The principal forms of regulation for which cost estimates or add-on charges are available include Communications Assistance to Law Enforcement, enhanced 911, local number portability, and number pooling.

1. Communications Assistance to Law Enforcement

The Communications Assistance to Law Enforcement Act requires telecommunications firms to modify their networks to permit electronic surveillance by law enforcement officials. The estimated monetary cost is 24 cents per customer per month during the first five years.[67] Multiplying this figure by an estimated 170 million[68] subscribers in 2004, yields a total annual cost of $491 million.

2. Enhanced 911

Basic 911 service requires wireline and wireless carriers to route 911 calls to a "Public Safety Answering Point."[69] Enhanced 911 requires the carrier to identify the caller's location to emergency dispatchers.[70]

Wireless carriers can implement enhanced 911 by using either network-based or handset-based technology (such as global positioning systems in mobile phones). Wireless carriers had to be ready to offer some aspects of enhanced 911 service by 1998. Cost data can be unreliable, but a Progress and Freedom Foundation study estimated

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[67] *See* Thomas M. Lenard & Brent D. Mast, *Taxes and Regulation: The Effects of Mandates on Wireless Phone Users*, PROGRESS ON POINT 10.18, 29 (Oct. 18, 2003), *available at* http://www.pff.org/issues-pubs/pops/pop10.18_wirelessmandates.pdf (last visited Oct. 10, 2006).

[68] *See Tenth Report*, *supra* note 59, tbl. 1 (estimating 170 million subscribers for 2004 as the average of the number of subscribers at year-end 2003 and 2004).

[69] FCC Consumer Facts: Wireless 911 Services, Federal Communications Commission, http://www.fcc.gov/cgb/consumerfacts/wireless911srvc.html (last visited Oct. 9, 2006).

[70] Enhanced 911 – Wireless Services, Federal Communications Commission, http://www.fcc.gov/911/enhanced/ (last visited Oct. 9, 2006).

that implementing enhanced 911 would cost wireless carriers approximately 61 cents per subscriber per month during the first five years.[71] Multiplying this figure by an estimated 170 million subscribers in 2004, yields a total annual cost of $1.2 billion. This figure is in addition to the 911 fees or taxes that telephone companies pay to local governments; those fees fund call centers and other 911 infrastructure run by governments.

3. Local Number Portability

Local service providers (wireline and wireless) were required to implement local number portability with supervision from the Federal Communications Commission under the Telecommunications Act of 1996.[72] "Under the Act and the Commission's rules, local number portability is defined as 'the ability of users of telecommunications services to retain, at the same location, existing telecommunications numbers without impairment of quality, reliability, or convenience when switching from one telecommunications carrier to another.'"[73]

Local number portability regulation gives consumers the ability to keep their phone number when switching between local service providers, be it a landline or wireless provider. The caveat, as the word "local" implies, is that the provider is only required to "port" the number if the individual is changing providers within the same metropolitan area.[74] An individual may switch from a landline provider to a wireless provider, as well as between wireless and landline providers. Individuals switching between wireless providers will also have to change phones, due to differences in technology used by the different providers. A source at the FCC stated, "[e]ven if your phone could be reprogrammed to work on a new network, carriers usually don't allow this."[75]

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[71] Lenard & Mast, *supra* note 67, at 3.

[72] *See* 47 U.S.C. § 251(b)(2)(2000). *See also In the Matter of Telephone Number Portability;* CTIA Petitions for Declaratory Ruling on Wireline-Wireless Porting Issues, 18 F.C.C.R. 23,697, ¶ 3 (2003) (hereinafter *Telephone Number Portability*).

[73] *Telephone Number Portability*, *supra* note 72, ¶ 3; *See* 47 U.S.C. § 153(30); 47 C.F.R. § 52.21(l) (2003).

[74] A Conversation on Wireless Local Number Portability: Video Updated, Federal Communications Commission, http://wireless.fcc.gov/wlnp/WLNP-video-transcript.pdf (last visited Oct. 10, 2006).

[75] *Id.* at 3 (quoting David Furth).

The weighted average of carriers' local number portability charges during most of the fourth quarter of 2004 was approximately 41 cents per month per subscriber.[76] This is slightly lower than the 50 cents per month estimated by previous studies, based on figures announced by the carriers prior to the implementation of number portability.[77] At 41 cents per subscriber per month for 170 million subscribers, number portability charges cost consumers approximately $836 million in 2004.

4. Number Pooling

Number pooling means the assignment of wireless phone numbers to companies in blocks of 1000 instead of 10,000. The FCC did this because carriers were using fewer than half of their assigned numbers, and they were running out of area codes. When numbers were assigned in blocks of 10,000, all numbers under the same "central office code" (the first three local digits of the number) were assigned to the same company. Pooling allows multiple companies to use the same central office code within an area code.

Number pooling requires network upgrades to route calls to the right company sharing a central office code. The principal economic study estimating the costs of number pooling finds that they would average 17 cents per customer per month during the first five years.[78] Multiplying this figure by 170 million subscribers in 2004, yields a total annual cost of $348 million.

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[76] Weighted average calculated based on carriers' number portability charges and fourth quarter 2004 subscribership. Number portability charges are from Associated Press, *Fees to cover cell number switching may reap profits*, CNN.com (August 17, 2003) http://www.cnn.com/2003/TECH/biztech/08/17/keeping.cell.nos.ap/.; Yuki Noguchi, *Verizon and Sprint to Cut Fee For Transferring Cell Numbers*, WASH. POST (November 16, 2004), *available at* http://www.washingtonpost.com/wp-dyn/articles/A52986-2004Nov15.html. Subscriber numbers are from Cingular: www.cingular.com/investors (this simply goes to the current Cingular investors web site, and does not show the relevant data.); Nextel: http://library.corporate- ir.net/library/63/633/63347/items/153590/NXTL 2004_AR_Fnl.pdf; Sprint: www4.sprint.com/04ar/downloads/Sprint04ar_AllPages.pdf; T-Mobile: www.t-mobile.com/company/about/quickfacts.asp (does not show data for 2004, and only shows global customers); Verizon: http://investor.verizon.com/financial/ annual/ 2004/feature01.html. Regional: Merrill Lynch, *Global Wireless Matrix 4Q04*, tbl. 132 (2005) (on file with author).

[77] *See* Lenard & Mast, *supra* note 67, at 12-19; Jerry Ellig, *Costs and Consequences of Federal Telecommunications Regulations*, 58 FED. COMM. L. J. 37, 65-73 (2005).

[78] *See* Lenard and Mast, *supra* note 67, at 26.

5. Total Regulatory Charges

Based on the foregoing figures, regulatory costs totaled $1.43 per subscriber per month in 2004, costing consumers $2.9 billion. This is a "bottom up" figure calculated by adding up separate cost estimates of each regulation. This estimate of the cost of regulation may differ from the total amount added to phone bills as "regulatory charges." Carriers might attempt to use a regulatory add-on charge to collect substantially more than regulation actually costs them. Alternatively, they might keep the regulatory add-on charge below the actual cost of regulation, fearing that a charge exceeding some level might spark negative consumer reaction.

Regulatory charges are the most opaque of the add-on charges. Some companies, such as T-Mobile and Cingular (also AT&T Wireless and Nextel prior to their respective mergers), lump many of these charges together into a single line item for "regulatory charges." Others, such as Verizon Wireless, break out a separate charge for local number portability. Interestingly, Verizon discontinued charging for wireless local number portability altogether near year-end 2004. The removal of this add-on charge does not necessarily mean that the cost of number portability has disappeared; it simply means that Verizon eliminated a potentially annoying charge from the bill instead of cutting the price of its calling plans.

As best we can tell, for most of the fourth quarter of 2004, total regulatory charges for number portability, number pooling, Communications Assistance to Law Enforcement, and enhanced 911 ranged from 86 cents for T-Mobile to $1.55 for Nextel. AT&T Wireless, which merged with Cingular in October of 2004, had charged $1.75.[79] Our average cost estimate of $1.43 per month is consistent with this range.

D. A Quarter on the Dollar

Regulatory charges are the most likely add-on that would have been prohibited under the original NASUCA proposal. Even if universal service add-on charges had also been prohibited (since government mandates the charges but does not mandate the pass-through to consumers), total add-ons under the NASUCA proposal would have fallen by about $4.7 billion annually, or 25 percent, compared to the rule adopted by the FCC. By far the largest add-on—state and local taxes—would remain legal. Thus, the original NASUCA proposal would have reduced add-on charges only by one-quarter of the total.

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[79] *See* Noguchi, *supra* note 76.

By mandating upfront disclosure, however, the FCC virtually guaranteed another, perhaps unintentional, result.

IV. Hidden Costs of Add-On Charges

Fundamental economic theory teaches that when additional taxes and fees alter prices, people alter their behavior in response. When taxes and fees increase prices, consumers buy less of the service, and they are worse off as a result. In economic terminology, the value that consumers forego, minus the price they would have paid, is the "forgone consumer surplus." Similarly, when prices inflated by regulation prompt consumers to use less of a service, producers sell less of it. The operating profits they lose on the sales they do not make are called "forgone producer surplus."

The total cost to consumers of a tax or regulation is thus not just the money taken directly from consumers' pockets, but also the consumer surplus forgone because consumers purchase less in response to the price increase. Similarly, the cost to wireless firms is not just the money they might spend to comply with the regulation, but also the producer surplus they forego because taxes or regulation reduce the amount that consumers are willing to purchase. Finally, the total cost of the regulation to society includes both the forgone consumer surplus and the forgone producer surplus. The total forgone surplus is also called a "deadweight loss."

A key factor determining the size of the forgone consumer surplus is the elasticity of demand, which measures the responsiveness of quantity purchased to a change in price. A high elasticity of demand means that consumers curtail purchases a great deal when the price increases. A low elasticity of demand means that consumers are not very sensitive to price changes, and they will cut back purchases only a little when taxes or regulations increase costs and prices. Taxes and regulations sacrifice more consumer surplus when the elasticity of demand for the service is high.

In addition to the elasticity of demand, a major factor determining the size of the forgone producer surplus is the additional cost associated with providing additional units of service. Marginal cost is the additional cost of providing one more unit of service. Incremental cost is the additional cost of providing a specified number of additional units of service. When prices are high relative to marginal or incremental costs, the producer surplus forgone due to taxes or regulations is high. Each additional unit of service sold would have generated substantial revenue in excess of the additional cost.

It is possible to combine estimates of wireless taxes, universal service contributions, and regulatory costs with information about the elasticity of demand and marginal costs to calculate the consumer and producer surplus forgone as a result of wireless add-on charges. A simple calculation to estimate the forgone consumer surplus is

$$(1)\Delta CS = .5\Delta p\Delta q,$$

where Δp is the change in price caused by the add-on charges, and Δq is the change in the quantity of service consumers purchase as a result of the price change. The elasticity of demand affects Δq; the greater the elasticity, the larger is Δq.[80] The change in producer surplus is given by

$$(2)\Delta PS = \Delta q(p-m),$$

where p is the price consumers would have paid for wireless in the absence of the taxes, universal service charges, and regulatory costs, and m is the marginal cost of producing wireless service.

Add-on charges will affect the quantity sold differently, depending on whether they take the form of a per subscriber charge or a per minute charge. This is because the measured elasticity of demand for wireless subscription is lower than the measured elasticity of demand for wireless minutes. Most economic studies that estimate the demand for wireless using the number of subscribers per hundred or the probability of subscription as the dependent variable yield elasticities of between -.43 and -.71.[81] That is, a one percent increase in the monthly subscription price reduces the number of subscribers by between four-tenths and seven-tenths of one percent. Studies that estimate demand employing minutes of use as the dependent variable yield much higher elasticities, between -1.12 and -1.29 using domes-

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[80] *See* Jerry Hausman & Howard Shelanski, *Economic Welfare and Telecommunications Regulation: The E-Rate Policy for Universal-Service Subsidies*, 16 YALE J. ON REG. 19, 36-37 (1999).

[81] *See* Jerry Hausman, *Cellular Telephone, New Products, and the CPI*, 17 J. BUS. & ECON. STAT. 188, 191 (1999) (estimating an elasticity of approximately -0.5 with 1988-1993 data); Jerry Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, 53 NAT'L TAX J. 738 (2000) (estimating an elasticity of -0.71); Mark Rodini et al., *Going Mobile: Substitutability Between Fixed and Mobile Access*, Center For Research on Telecommunications Policy Working Paper Crtp-58 (Dec. 2002) (estimating an elasticity of -.43 with respect to the monthly access charge and an overall price elasticity of demand of -0.6 with 2000-2001 data), *available at* http://ssrn.com/abstract=379661; Christopher Garbacz & Herbert G. Thompson, Jr., *Universal Telecommunication Services: A World Perspective*, INFO. ECON. & POL'Y 495, tbl.5 (2005) (estimating an elasticity of -0.45).

tic U.S. data and between -1.71 and -3.62 using international data.[82] Thus, a one percent price increase is likely to lead to a greater than one percent reduction in wireless minutes. Some of this reduction may occur because fewer consumers decide to get wireless service, and some may occur because consumers who get wireless service decide to purchase a smaller bucket of minutes, use fewer minutes in excess of their monthly allowance, or use fewer prepaid minutes.

These findings are consistent with voluminous research on wireline telephone demand, which consistently finds that subscription is not very sensitive to the monthly price. In fact, for the United States the most recent studies suggest that the elasticity of demand for wireline access is virtually zero (though that may be changing as wireless has become a more viable substitute for wireline service).[83] Services priced by the minute, however, such as long distance, have much more elastic demand than does subscription.[84] Interestingly, the elasticities of demand for wireless subscription are in the same range as elasticities of demand for second wireline phone lines in the U.S., which range between -.35 and -.59.[85] Intuitively, this similarity makes sense, since a wireless phone can substitute for a second phone line.

Add-on charges that vary with the number of minutes used, therefore, will lead to larger deadweight losses than add-on charges that take the form of a fixed fee per subscriber. Unfortunately, the bulk of add-on charges—taxes and universal service contributions—are calculated as a percentage of wireless revenues. Since revenues from a customer depend on the size of the calling plan the customer purchases, taxes and universal service charges act roughly like per-

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[82] *See* J. Gregory Sidak, *Is State Taxation of the Wireless Industry Counterproductive?*, CRITERION ECON., (April 2, 2003) (using 1999-2001 U.S. data), http://www.criterioneconomics.com/docs/sidak_pacific_research.pdf; Thomas W. Hazlett & Roberto E. Muñoz, *A Welfare Analysis of Spectrum Allocation Policies*, AEI-Brookings Joint Center for Regulatory Studies Related Publication 04-18, 15 (Aug. 2004), http://www.aei-brookings.org/admin/authorpdfs/page.php?id=1024.

[83] *See* ROBERT W. CRANDALL & LEONARD WAVERMAN, WHO PAYS FOR UNIVERSAL SERVICE? 91 (Brookings Institution 2000); Garbacz & Thompson, *supra* note 81, at tbl.5.

[84] *See* M. H. Riordan, *Universal Residential Telephone Service,* in 1 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS 436 (M. Caves et al. eds., 2002).

[85] *See* James Eisner & Tracy Waldon, *The Demand for Bandwidth: Second Telephone Lines and On-line Services*, 13 INFO. ECON. & POL'Y 301, 308 (2001); Kevin T. Duffy-Deno, *Demand for Additional Telephone Lines: An Empirical Note*, 13 INFO. ECON. & POL'Y 283, 295 (2001).

minute charges. Only the regulatory fees are recovered as a fixed charge per subscriber.

Table 1: Annual Economic Effects of Add-on Charges (2004)

	Wealth Transfer	**Forgone Consumer Surplus**	**Forgone Producer Surplus**	**Total Deadweight Loss**
Regulatory charges	$2,922,087,464	$23,013,294	$740,924,021	$763,937,314
U Svc. + Taxes	$15,898,780,680	$1,277,483,624	$7,559,266,039	$8,836,749,662
Actual Total	$18,820,868,144	$1,300,496,917	$8,300,190,059	$9,600,686,977
Make all a per Subscriber charge	$18,820,868,144	$829,928,414	$4,148,480,841	$4,978,409,256
Make all a per Minute charge	$18,820,868,144	$1,747,217,715	$8,733,643,877	$10,480,861,591

Table 1 presents some calculations that illustrate this point. Each line shows the total revenue raised or regulatory cost ("wealth transfer"), along with the associated reduction in consumer surplus, producer surplus, and total deadweight loss. The first three lines show the losses associated with per-subscriber regulatory charges and percentage taxes and universal service contributions. This is the "baseline" case that represents the way these charges are assessed currently. Regulatory charges are assessed per subscriber, whereas universal service charges and taxes are essentially assessed per minute.[86]

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[86] *See supra* Part III.A-C (using estimates of regulatory charges per subscriber and the number of subscribers from said parts to estimate effects of regulatory charges); *Tenth Report*, *supra* note 59, at 89 tbl.9 (reporting the average monthly bill in 2004); For the producer surplus calculation, the annual incremental cost of a wireless subscriber is estimated at $327, which equals the annual number of minutes per subscriber x marginal cost of 5 cents/minute found in Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, *supra* note 81, at 737.

Estimates of effects of taxes and universal service contributions start with a total universal service contribution from wireless of $1.77 billion. This figure was calculated by multiplying total 2004 universal service expenditures of $5.4 billion x 32.6 percent, the share of universal service contributions from wireless. [Data sources in footnotes supra] Universal service charge of 0.16 cents/minute is the total universal service contribution from wireless divided by the estimated total wireless minutes in 2004. Estimated total minutes are equal to 170 million estimated

The hidden costs of regulatory charges, universal service contributions, and taxes are large. The $1.3 billion in forgone consumer surplus equals seven percent of the $18.8 billion that these charges transfer from consumers. The total deadweight loss of $9.6 billion is about half of the $18.8 billion in explicit costs.

The fourth line estimates the size of the losses if all of the funds were collected through per-subscriber charges. Although both policies would generate the same amount of explicit costs, the hidden costs of per-subscriber charges are much smaller than the hidden costs of the current system, in which most add-on charges are calculated as a percentage of revenues. Collecting all add-ons as per-subscriber charges would reduce forgone consumer surplus by $470 million and forgone producer surplus by $4.2 billion, for a net reduction in deadweight loss of $4.7 billion. In other words, making all add-on charges per-subscriber charges would cut the deadweight loss by almost half.

Line five underscores the difference by estimating the size of the inefficiencies if all add-ons were per-minute charges. Compared to the current mixed system, the forgone consumer surplus and producer surplus would rise by almost $1 billion.

The figures in this table assume that the elasticity of demand for wireless access is -0.57, approximately the midpoint of the range of estimates in empirical studies.[87] If the actual elasticity is lower, then the deadweight loss is smaller. An elasticity of -.43, for example, would reduce total deadweight loss by $5.8 billion, compared to the actual baseline, if all add-on charges were per subscriber charges.

The elasticity of demand for wireless minutes is assumed to be -1.2, the midpoint of estimates using U.S. data.[88] A higher elastic-

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subscriptions x 6546 estimated minutes/subscription. [Data sources in footnotes supra] Price per minute of 9.2 cents = (170 million subscriptions x $50.28 estimated monthly bill x 12)/1.12 trillion minutes. Monthly bill is from footnotes supra. Marginal cost is assumed to be 5 cents/minute, following Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, *supra* note 70, at 737.

[87] *See* Jerry Hausman, *Cellular Telephone, New Products, and the CPI*, 17 J. BUS. & ECON. STAT. 188, 191 (1999) (estimating an elasticity of approximately -0.5 with 1988-1993 data); Jerry Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, 53 NAT'L TAX J. 738 (2000) (estimating an elasticity of -0.71); Mark Rodini et al., *Going Mobile: Substitutability Between Fixed and Mobile Access*, Center For Research on Telecommunications Policy, Working Paper No. 58, Dec. 2002 (estimating an elasticity of -.43 with respect to the monthly access charge and an overall price elasticity of demand of -0.6 with 2000-2001 data), *available at* http://ssrn.com/abstract=379661; Christopher Garbacz & Herbert G. Thompson, Jr., *Universal Telecommunication Services: A World Perspective*, INFO. ECON. & POL'Y 495, tbl.5 (2005) (estimating an elasticity of -0.45).

[88] *See* Sidak, *supra* note 82, at 19 tbl.5.

ity would yield a higher deadweight loss, and a lower elasticity a lower deadweight loss. The key point to keep in mind, though, is that per minute charges will create more deadweight loss than per subscriber charges as long as the price elasticity for wireless minutes is greater than the price elasticity for wireless subscription.

All of these calculations assume that sufficient consumers on the margin correctly perceive the price change that add-on charges represent. Consumers who are not quite sure if a wireless phone is worth the cost, or who are teetering between two different size wireless plans, will purchase less wireless service if they know about the add-on charges than if they don't. If wireless firms succeed in hiding the true size of add-on charges from marginal consumers until they are already locked in to service contracts, then these consumers will not respond to this price signal. They will purchase more wireless service than they would purchase if they knew the true cost.

If truth-in-billing actually improves consumer information about costs, it helps ensure that consumers accurately perceive the full cost of add-on charges. As a result, it produces a somewhat perverse effect, because it helps guarantee that consumers will reduce their consumption of wireless service in response to the price-increasing effect of add-on charges. If most consumers paid per minute of use, as in the early days of wireless service, they could simply adjust their usage once they received the first bill and learned the true price. But since wireless plans are commonly sold as "buckets" of minutes, consumers who do not know the size of add-on charges may commit to buying more minutes than they would buy if they knew the full cost. Similarly, some consumers who were debating between purchasing and not purchasing wireless service might decide they had made a mistake once they learned the full magnitude of add-on charges.

For this reason, truth-in-billing makes it even more imperative that regulators and policymakers find ways to minimize the distortionary effects of add-on charges.

V. Implications for Policy Reform

Table 2 estimates the effects of several different policies to reduce the inefficiency associated with wireless add-on charges. Scenario one alters the universal service contribution system to replace percentage contributions with per-subscriber contributions in a revenue-neutral way. It raises the same amount of revenue from wireless, but it results in a $530 million increase in social welfare (or a $530 million reduction in deadweight loss), compared to the baseline. This reform is roughly equivalent to replacing per minute charges with a

numbers-based or connections-based tax—an alternative already under consideration in the debate over restructuring the federal universal service funding mechanism.

Table 2: Annual Economic Effects Post-Reform

	Wealth Transfer	**Difference from Baseline**	**Deadweight Loss**	**Difference from Baseline**
Baseline	$18,820,868,144	N.A.	$9,600,686,977	N.A.
Reform Scenarios				
1. Make U service a per subscriber charge	$18,820,868,144	$0	$9,071,665,477	$529,021,500
2. Reduce state taxes to state average sales tax rate	$14,903,383,252	$3,917,484,892	$7,405,232,106	$2,195,454,871
3. Repeal federal excise tax	$15,736,234,371	$3,084,633,773	$7,871,103,117	$1,729,583,860
4. Eliminate wireless U service charge	$17,049,710,144	$1,771,158,000	$8,606,800,057	$993,886,920
5. Ensure that regulatory benefits > costs	$15,898,780,680	$2,922,087,464	$8,836,749,662	$763,937,314

The improvement follows automatically from the shift from taxing something that is more price-sensitive (wireless usage) to taxing something that is less price-sensitive (wireless subscription). Such results are not unusual in telecommunications. Since the mid-1980s, for example, federal regulators have consistently sought to replace per-minute "access charges" that inflate the price of long-distance service with flat monthly federal subscriber line charges. Since subscribership is much less sensitive to price increases than per-minute long-distance use, the result has been a substantial increase in economic welfare.[89]

Scenario two, reducing average state wireless taxes to the same level as average state general sales taxes, also leads to a substantial improvement in social welfare. State and local taxes on wire-

[89] *See* Jerry Ellig, *Intercarrier Compensation and Consumer Welfare,* 2005 U. ILL. J. L. TECH. & POL'Y 97, 98-99 (2005).

less averaged 10.74 percent in 2004, whereas state and local general sales and use taxes averaged 6.93 percent.[90] If wireless taxes are reduced to the same level as general sales taxes, state tax revenues will fall due to the lower tax rate. This effect is offset somewhat by the fact that the reduction in the tax rate prompts consumers to buy more wireless service, thus expanding the tax base to which the lower rate is applied. The deadweight loss associated with add-on charges falls by about $2.2 billion when state wireless taxes are reduced. The improvement comes because wireless usage expands in response to the tax reduction, generating increases in consumer and producer surplus, along with some additional revenues that help offset the revenue lost due to the lower tax rate.

Scenario three is another commonly-proposed reform: repeal of the three percent federal excise tax on telecommunications. For wireless, this reform effectively occurred in 2006 as a result of the U.S. Treasury's decision not to contest court decisions declaring that the tax applies only to toll services that vary both with distance and elapsed transmission time. These decisions effectively removed the tax from wireless packages.[91] Elimination of this tax on wireless can be expected to cut federal revenues and save consumers about $3.1 billion. In addition, overall economic welfare would increase by $1.7 billion, as the deadweight loss associated with add-on charges falls from $9.6 billion to $7.9 billion.

Scenario four shows the effect of eliminating universal service contributions from wireless. Policymakers could accomplish this in several ways, such as better targeting of universal service funding so that the wireless contribution is not needed, or funding universal service programs through general taxation rather than mandatory contributions from telecommunications carriers. Examining just the effects in the wireless market, eliminating universal service contributions would increase economic welfare (reduce deadweight loss) by $1 billion.

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[90] *See* Mackey, *supra* note 61, at 184 tbl.2.

[91] *See e.g.,* Am. Bankers Ins. Group v. United States, 408 F.3d 1328 (11th Cir. 2005) (holding the federal excise tax on "toll telephone service" inapplicable unless the toll telephone service charge varies with the distance *and* elapsed transmission time of each call as per 26 U.S.C. § 4252(b)(1) (2006). The Treasury announced in May 2006 that it would no longer contest the court decisions. *See* I.R.S. Notice 2006-50, 2006-25 I.R.B 1141 (May 26, 2006) (following the holdings in Am. Bankers Ins. Group v. United States, 408 F.3d 1328 (11th Cir. 2005); OfficeMax, Inc. v. United States, 428 F.3d 583 (6th Cir. 2005); Nat'l R.R. Passenger Corp. v. United States, 431 F.3d 374 (D.C. Cir. 2005); Fortis v. United States, 447 F.3d 190 (2nd Cir. 2006); and Reese Bros. v. United States, 447 F.3d 229 (3rd Cir. 2006)).

Funding universal service through general revenues leads to an overall increase in economic welfare as long as the deadweight loss associated with general taxation is lower than the deadweight loss associated with wireless taxation. Most economic studies find that general taxation usually involves a deadweight loss of 25-40 cents per dollar raised.[92] For wireless, the $1 billion deadweight loss divided by the $1.77 billion in revenue yields a deadweight loss equal to about 56 percent of revenue—clearly higher than the deadweight loss associated with general taxation.

Scenario five focuses on reducing the inefficiencies of regulatory mandates—not necessarily by eliminating regulation, but rather by ensuring that any mandates create value for consumers at least equal to their cost. If mandated 911 service, for example, produces benefits for consumers that exceed the costs, then the mandate could generate increased purchases of wireless service in spite of the additional cost. This result would occur if the additional benefits exceed the additional costs for the vast majority of marginal consumers—that is, consumers who are just on the edge of subscribing to a more expensive calling plan, or are not sure if they will subscribe to wireless service at all. If mandated 911 has negative or no value for a substantial number of marginal consumers, then the mandate may not produce an increase in wireless subscribership or usage even if the aggregate benefits exceed the costs. If benefits of regulation just equal the costs of regulatory charges for a sufficiently large number of marginal consumers, then consumers receive at least $2.9 billion in benefits to offset the costs. We model this change as a $2.9 billion reduction in the wealth transfer, since consumers receive benefits that offset the regulatory costs. Under such a scenario, regulation does not reduce consumption of wireless service, and $760 million worth of deadweight loss disappears.

Unfortunately, there is little systematic evidence that regulatory charges produce results that most consumers would regard as worth the costs. A comprehensive survey of studies on the effects of telecommunications regulation revealed that no studies evaluate whether local number portability, number pooling, and CALEA have produced measurable benefits to consumers or society.[93] A few studies indicate that wireline 911 service has saved lives and reduced hospital costs significantly, but no similar studies exist for wireless

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[92] Jerry Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, 53 NAT'L TAX J. 733 (2000).

[93] Ellig, *supra* note 77, at 73-75.

911.[94] Therefore, it is not clear whether the regulatory mandates create benefits at least equal to their costs.

VI. Conclusion

Truth-in-billing seeks to ensure that consumers receive a realistic estimate of add-on charges before signing a wireless service contract. Although the regulation likely increases billing transparency, it also has the potential to generate significant consumer and social costs as consumers respond to perceived price increases by purchasing less wireless service than they otherwise would have purchased. If the premise underlying truth-in-billing is true, truth-in-billing prompts consumers to purchase less wireless service because they perceive the price to be higher than they would otherwise perceive it to be. If, on the other hand, the underlying premise is not true and consumers already accurately perceived the extent of add-on charges, then truth-in-billing was not necessary, but the deadweight losses were always with us.

Add-on charges impose substantial costs on consumers and society. Truth-in-billing seeks to make these costs more transparent to consumers. Even if truth-in-billing works perfectly, however, significant costs remain hidden from consumers and policymakers alike. Add-on costs alter prices, and prices alter consumer behavior. The resulting deadweight loss totaled about $9.6 billion in 2004—about half of our estimated $18.8 billion in add-on charges. The deadweight loss is also several times the $2.9 billion in regulatory add-on charges that prompted the original NASUCA petition which led to the FCC's current truth-in-billing disclosure policy. Because it represents a forgone opportunity associated with the current level and structure of add-on charges, this $9.6 billion is effectively hidden, and truth-in-billing does nothing to change this.

If current add-on charges were designed to minimize inefficiency, then there would be little else to say. Economic welfare improves when consumers receive more accurate price signals, and add-on charges would simply be an efficient price signal. However, it is unlikely that the current structure of add-on charges minimizes inefficiency. Indeed, policymakers and regulators' tendency to assess most of these charges as a percent of revenues turns them into usage-based charges that generate substantial inefficiencies.

Policymakers and regulators could reduce the hidden costs of add-on charges in three ways:

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[94] *Id.*

1. Alter the structure of add-on charges by assessing some or all of them as per-subscriber charges rather than percentage or per-minute charges. If the charges were assessed in this way, wireless firms would likely pass them on to consumers as per subscriber charges instead of percentage or per minute charges. Economic welfare losses would likely be lower, because a per-subscriber charge generates less inefficiency than usage-based charges that raises the same amount of revenue.

2. Reduce the size of add-on charges by lowering taxes and/or universal service contributions. Whether the charges are per subscriber or per minute, reducing the charges lowers the price distortion and hence reduces the inefficiency.

3. Reduce the disincentive effects by ensuring that add-on charges fund improvements in wireless service that most marginal consumers believe are worth the cost. If benefits associated with the charges equal or exceed costs, then the increased value of the service to consumers could well generate an increase in demand that outweighs the decrease prompted by the price change. This result is most likely to occur with regulatory charges, which fund specific features and functionalities of wireless networks. If regulatory charges are more transparent, then policymakers may face greater consumer demand to justify them.

One can only hope that the price transparency fostered by truth-in-billing will also provide impetus for further reform as consumers become more fully aware of the size of add-on charges. The unintended consequences of add-on charges make it critical that policymakers and regulators understand and address the hidden costs—*especially* when add-ons are fully disclosed.