
Cell Phones Provide Significant Economic Gains for Low-Income American Households

A Review of Literature and Data from Two
New Surveys

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*You Can Hear Me Now: How Microloans and Cell Phones
Are Connecting the World's Poor to the Global Economy
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Table of Contents

Executive Summary3
Overview.....6
Methodology.....7
General Findings.....8
The Decline in Household Penetration9
The Mobile Phone’s Role in Safety and Security14
New Surveys: The Mobile Phone as a Safety and Security Device15
Economic Impact of Cell Phones16
Mobile Phones and Economic Gains.....17
Conclusions.....22
Bibliography25

Executive Summary

Americans, and particularly those in lower-income groups, are deriving clear economic benefits from cell phones—even though low-income groups are far less likely to own a cell phone.

The average amount of money earned by those who said they use their cell phone to get work or make money was \$748.50 last year, according to analysis by polling firm Opinion Research Corp. (ORC). For households in the bottom two quintiles making \$35,000 or less, the mean reported earning was \$530. This translates to income gains of \$4.5 billion, and suggests that – if the 38% of these 45.2 million low-income, bottom quintile households that do not now have cell phones were to start using them, and earn money at the same rate as those households that do own cell phones—it would add \$2.9 billion to household incomes.

This new study on cell phone usage in America is based on two new surveys—a scientific national sampling of 1005 households by ORC and a statistically large online sampling of 110,000 TracFone prepaid phone users. While the study examines all cell phone owners, the focus is primarily on benefits to those in the bottom two quintiles of household income (less than \$35,000), who are much less likely to own cell phones. Those who do not now own a cell phone tend to be older (37% are retired), less educated (29% have a high school education or less; 25% have some college but not completed), low income (38% make less than \$35,000 a year) or unemployed (30%). This suggests that a significant minority of Americans who are most in need are not benefiting from the economic gains that other Americans attribute to their cell phones.

Another dominant finding is that super majorities from every demographic segment say the cell phone is “extremely important” for “emergency use,” and overwhelmingly prefer a cell phone to a landline phone as a security blanket. Nearly half of respondents (48%) in the ORC survey have used their phone to call or text during an emergency situation, a fifth (20%) have received an emergency call or text on their cell phone, and nearly a third (32%) have bought a cell phone for a relative to use in emergency situations. By more than a 3-1 ratio, Americans say they prefer a cell phone to a landline phone for emergency use.

To a certain extent, these security results confirm the expected. But whereas much has been made of the social and cultural impact of “anytime anywhere” communications, these new insights into the productivity value at the household level (rather than the firm level) are notable. More than three-quarters of those polled by ORC use their cell phones to discuss work or money, and nearly a third of those working say their cell phone has helped them make money, get new work or customers. Far more respondents in blue collar jobs say their cell phone has gotten them work or money (40%) than those in white collar professions (27%)—as do far more prepaid (43%) than postpaid (28%) cell phone owners. The gains for low-income Americans are notable given that the average number of minutes (280 per month) was below the overall average (303), and income tends to rise with minutes used.

But the income gains and potential noted above may be conservative figures, as the ORC research was conducted by landline phone and may not have reached those who are more active cell phone users, or those who rely exclusively on cell phones, which is an estimated 5-10% of U.S. households. Nor were respondents asked to quantify sums above \$1,000, and 50% of respondents cited gains of more than \$1,000.

In the much larger (albeit non-scientific) Tracfone survey, where 30% of *working* households (not retired, student, unemployed) attributed gains to their cell phones, the average annual gain cited was a much higher \$2,361 per household. (Respondents were asked to quantify sums up to \$10,000 and above.) Using this calculus, if non-cell phone households in the two lower income quintiles were to acquire phones and earn money at the same rate, it would translate to \$11.1 billion in new income gains. Thus, pending further research, it is fair to use the ORC data as a lower bound and the TracFone data as an upper bound, putting put the potential economic gain for low-income households in the \$2.9 to \$11 billion range.

The ORC polling showed that another economic benefit for all income segments was time savings, with more affluent households saving more time, a function of using more minutes. Further, prepaid users, who are typically less educated and from lower income households, and who use far fewer minutes (209) than average, overwhelmingly cite monthly cost savings compared to contract cell phones. In many cases, prepaid users have been

unable to keep up with large and unanticipated monthly phones bill for postpaid phones and switched to prepaid phones. While ORC pollsters did not ask respondents to quantify savings, TracFone respondents estimated monthly savings of \$35 compared to postpaid phones, for an annualized total savings of \$419. Combining these savings with the income gains significantly increases the already notable economic benefit to low-income households.

The overall conclusion is that the cell phone is extremely important to Americans for personal safety, and a huge boon to an individual's economic productivity and earning power. The cell phone is particularly important to blue collar, less educated and low-income segments, even though those groups are far less likely to own cell phones.

Overview

In the United States, telephone penetration rates (the number of households with any telephone access) are dropping even as sales of mobile phones skyrocket. [Mobile subscribers numbered 243 million in the middle of 2007 (CTIA annual survey).] The U.S. now has the second lowest telephone penetration rate in the developed world.

Why are households in the richest country in the world losing telephone access—in a country where universal access has been codified by regulators since 1934, and where the number of cell phones far exceeds the number of households? What benefits of telephony are being lost along with access? Are any of the well-documented benefits of cell phones seen in the developing world being replicated amongst low-income groups in the U.S.? These are the questions this paper addresses.

Most of the recent studies on the impact of cell phones on poor populations have focused on the developing world, where the sales growth and penetration increase have been exponential and dramatic, and where the vast majority of the world's poor reside. Studies on the impact of cell phones in the developed world, and the U.S. in particular, are scant in number. Studies that do exist focus on social interaction and cultural and generational shifts, on ICT and Internet broadband access, on productivity at the firm (not household) level, or on high-level issues of infrastructure investment and competition.

Timeline studies on the impact of universal telephony (landline) are more common. These studies show national income gains in developed countries, particularly during the 1970-1990 period but more incremental in recent years, since service levels are so high that very little incremental productivity or economic gains are derived from adding small percentage of phones. But the studies notably make little demographic breakout, and thus don't focus on the so-called "forgotten poor" in the developed world.

This is the first study that specifically targets the impact of cell phones on poor and low-income households in the U.S. (the bottom two quintiles with annual incomes less than \$35,000) and comes at a time when the household penetration rate is dropping, and more people are transitioning to wireless phones only. Meanwhile, efforts to achieve universal service, which have shown some signs of success in some states, focus exclusively on fixed line

phones. In addition, this study attempts to draw some comparison between users of prepaid cell phone users, who tend to be from lower income groups, and contract (postpaid) cell phones.

Methodology

In addition to a review of existing literature, the findings presented in this paper are based on two new surveys, both of which focused on the security and economic benefits of mobile phones. The primary survey was a scientific, randomized (computer generated nth-caller) and representative national probability sample of 1005 U.S. households, conducted by Opinion Research Corp. Interviews were conducted with 504 men and 501 women 18 years of age and older, living in private households in the continental United States, during the weekend of Oct 25-28, 2007, by fixed-line phone interviews (i.e., cell phones were not used). Random digit dialing to both listed and unlisted numbers was used.

Respondents split roughly evenly amongst those who used landline only (233), used both cell and landline equally (292), used both but primarily landline (241), and used both but primarily cell (221). Among cell phone users, 167 (22%) said they were prepaid cell phone customers. Because all calls were made to landlines, the survey did not capture those who either had no phones, or had a cell phone only.

There were 753 cell phone users in the survey (75%), and most of the follow-up questions were addressed to these respondents. Those with incomes less than \$35,000 and less than \$50,000 were less likely to own cell phones, while those with household incomes higher than \$50,000 and those from dual-income households were more likely to own a cell phone. Households with three or more people, and those with more children, were more likely to use cell phones, as were those with more education.

The second survey of more than 110,000 TracFone prepaid customers (“National Survey on Social and Economic Impact of Cell Phones”), was conducted during September 2007. This was not a scientific, randomized survey of the U.S. population. TracFone customers were notified by email, and self-selected respondents filled out a survey form on the Internet. However, the number of responses do make it a statistically significant drill-

down survey on the attitudes of prepaid phone owners; further, 12% of respondents used a cell phone only, which gives a snapshot of a growing minority of Americans.

Neither survey, of course, probed households without any phone access, thus theories presented here on why household penetration rate is slipping derive from a review of the literature and best guesses based on a combination of the surveys and focus groups.

General Findings

The most dominant finding from both surveys was that super majorities from every demographic segment say the cell phone is “extremely important” for “emergency use,” and overwhelmingly prefer a cell phone to a landline phone as a security blanket. Nearly half of respondents have used their phone to call or text during an emergency situation, and nearly a third have bought a cell phone for a relative to use in emergency situations.

On the economic side, more than three-quarters of those working either full- or part-time, use their cell phones to discuss work or money, with 45% attributing more than a quarter of their calls to work. Nearly a third of those working say their cell phone has helped them make money, get new work or customers. Far more respondents in blue collar jobs say their cell phone has gotten them work or jobs (40%) than those in white collar professions (27%); not surprisingly, heavier cell phone users derived more economic gains. The average amount of money earned for all cell phone users was \$748 last year, and higher (\$874) for those who rely primarily on the cell phone. Households making less than \$35,000 a year, despite far fewer minutes used, earned an average of \$530, which translates into an aggregate economic benefit of \$4.5 billion for that cohort.

In addition, three-quarters mention another economic benefit, which is saving time. The average amount of time saved was 2.6 hours per week.

More than half (58%) said if they had to choose only one phone, it would be a cell phone rather than a landline phone. Those who do not now have a cell phone tend to be older (37% are retired), less educated (29% have a high

school education or less), from households with less than \$35,000 annual income (38%) or unemployed (30%).

This suggests that a significant minority of Americans are not benefiting from the safety and economic gains that other Americans attribute to their cell phones. Based on income gains for those who do have phones, the data suggest that if non-owners were to acquire cell phones and use them as productively as others in their cohort, it would add anywhere from \$2.9 billion to \$11.1 billion to income for households earning less than \$35,000.

Overall, the findings suggest that the cell phone is a viable alternative to a landline phone and for practical purposes is more valuable than a landline phone. For those who cannot afford two phones, the cell phone is a better option. Further, for those who cannot afford a contract cell phone, the prepaid phone is a viable alternative. In the TracFone survey, for example, 34% of Hispanics (1935 respondents) said they had a prepaid cell phone as their only phone.

Organization of Paper

This paper first addresses the declining household penetration levels in the U.S., and suggests several reasons why it may be occurring in a period of exploding cell phone sales. I review the literature and theories on the impact of cell phones on safety and crime prevention, before reviewing my own survey results. Finally, I review the literature on the economic impact of telecom in the developed world, before describing my own surveys that focus on the United States. A conclusion follows.

The Decline in Household Penetration

Household phone penetration in the U.S. rose from 91.8% in 1984, just before the breakup of AT&T, to 94% in 1997, and to 95.5% in March 2003. Given the rapid rise in cell phone sales and subscriptions, one would expect the phone-penetration rate to remain steady or keep rising, even given that more and more households convert to wireless phone only. But by March 2006, the penetration rate had dropped to 92.9% (FCC 2007), a statistically significant decline, with younger households showing the greatest decline, and larger households the least decline. Virtually every state and every income group shows a decline in penetration. Approximately 3.7 million fewer U.S.

households now have the ability to dial 911 in an emergency (Zimmerman, 2007). With the exception of Portugal, all of the EU 15 member countries and Canada have higher household telephone penetration rates than the U.S (Gabel & Gideon, 2006).

Since lower penetration rates are typically observed at lower income levels, particularly among recent immigrants, illegal immigrants, Hispanic and African-American households, not to mention large numbers of white households, and because communications has been proven to be so important to personal and economic security (and reproved by these new surveys), it's important to understand the reasons behind the lower penetration and how it has impacted income potential.

Universal service has been a goal of U.S. policy makers since the Communications Act of 1934 codified its terms: "To make available, so far as possible, to all the people of the United States, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges." The initial use of the term "universal service," by AT&T president Vail in 1907, was corporate speak for a monopoly as opposed to the "dual service" allowed under competition. Nonetheless, the goal of universal service, reaching all households at a reasonable cost, was part of the rationale for allowing AT&T's Bell-system monopoly.

**Possible Explanations
for Declining
Penetration Rates**

Typically, high long-distance rates have subsidized lower local calling rates; high business rates have subsidized lower residential rates; and higher urban rates have subsidized rural rates. Since the Telecommunications Act of 1996, there has been significant "rate rebalancing" to move toward market-value pricing.

Many have written about the market distortions caused by the inherent subsidies, although most studies find that the elasticity of connection with respect to price is low, and there are relatively small gains in penetration when prices are lowered (Crandall and Waverman 2000; Garbacz and Thompson 2005; Rosston and Wimmer 2000). Studies suggest that the initial connection fee is more of an impediment to access than the monthly usage fees.

Controlling costs.

A recent paper (Milne, 2006) suggests that traditional regulatory provisions for ‘social tariffs’ have been focused on fixed lines—when people in developed countries on low or irregular incomes are increasingly abandoning fixed lines for the flexibility of prepaid mobile phones. Pre-payment eliminates bills and provides full user control of cash outgoings, both features that people on slim budgets tend to appreciate. For people who make little use of the phone, the relevant tariffs often reduce cash outlays overall compared with a fixed line (relatively high call charges being offset by low or zero regular payments).

Milne suggests that much of the innovation with prepaid phones is occurring in the developing world, but could have useful applications in developed countries. For example, over-the-air person-to-person credit transfers could be very popular for ‘rescuing’ friends and family members when their call credit unexpectedly runs out. And mobile commerce (allowing small payments, such as parking fees, through mobile phones), now spreading rapidly among the ‘unbanked’ in the developing world (particularly in South Asia and sub-Saharan Africa), could be especially valuable to some groups in developed countries—for example, elderly people who have traditionally preferred to use cash but now have difficulty getting out and about.

Dual phone ownership.

Another perspective on penetration declines (Gideon and Gabel, 2006) suggests that local rate rebalancing brought on by competition (Knittel 2004) and the consequent rise in landline pricing might be a possible cause for an increase in disconnects, although the authors note the many papers showing low elasticities of price related to service.

A more likely cause of disconnects, the authors hypothesize, is the cost impact of dual-phone ownership, a function of an increase in wireless phones per capita. As households add wireless phones to their “monthly nut,” the bills can get out of control. Contract wireless phones lead to volatile, unpredictable and large phone bills that result in disconnecting both landline and cell phone. In other cases, low-income households may even substitute a wireless for a

landline phone to save money, but then experience unpredictably high bills — from paying for received calls as well as outgoing, confusing details of calling plans, and usage of minutes beyond the fixed price package. In both cases, the household's telephone service may be cut off.

Households with cell phone service only are most vulnerable. They are most likely to be students, renters, single-person households, and low-income households (Tucker et al, 2005). These wireless subscribers are disconnected, and then unable to reconnect landline service due to outstanding balances or poor credit history.

Given these scenarios, it's surprising that in Gideon and Gabel's econometric regressions, poverty itself is not a particular driver of the penetration decrease, although they find the recent decline in penetration levels partially driven by an increase in black and recent immigrant populations, which tend to be lower-income households.

Our own surveys tend to support this hypothesis. In our TracFone survey, 65% of those who relied on just a prepaid cell phone had household incomes less than \$35,000. (Since Opinion Research Corp. conducted surveys by landline phone, no respondents relied exclusively on cell phones.)

Inadequate consumer protection laws.

States with inadequate consumer protection laws also see higher levels of disconnects, as consumers who purchase wireline and wireless from the same provider can be disconnected from both for nonpayment of their wireless bill. As a test of the thesis that consumer laws are at fault, the authors included a dummy variable in their econometric regressions for states where Qwest provides service.

Qwest is the only ILEC that does not own a wireless network (although it is a reseller of wireless service). As a consequence, Qwest is likely to be less aggressive in marketing wireless service to its landline customers. In states where Qwest operates there was an increase in telephone penetration, supporting the authors' hypothesis that aggressive marketing of additional

services may be making bills less predictable and pushing people off the network.

Although the authors do not differentiate between prepaid and postpaid wireless accounts, it should be noted that prepaid customers cannot be cut off (although they can, of course, voluntarily stop using the phone for extended periods with minimal repercussions). This would suggest that those with prepaid phones, and therefore less volatile and more controllable bills without hidden costs, would be less likely to lose all telephone service if, in fact, dual-phone ownership is a determining factor in dual disconnects.

Lifeline and Link-Up Programs.

Government-led efforts to extend telephone service through programs such as Lifeline and Link Up have been effective to a point, particularly where there have been “full or high assistance” levels of support. Between 1984 and 1997, low-income households (less than \$10,000 in 1984 dollars, which is essentially the poverty line for a family of four in 2006 dollars) with assistance increased their penetration level from 79.3% to 85.5% (FCC, 2007), nearly double the increase rate of households without assistance. But between 1997 and 2006, the gains have been minimal (1.2%) for those states offering “full or high assistance” levels. In states with “intermediate” (-.2%) or “low” (-2.7%) assistance levels, penetration rates amongst the poorest households have dropped.

While the level of assistance obviously shows impact, FCC data also shows that between 2003 and 2006, the percentage of households with telephone service dropped roughly 3 percentage points in every single income group, clearly supporting the theory that poverty alone cannot explain the declines.

However effective Lifeline and Link-Up programs may or may not be, it’s clear that neither program is currently effective in stemming the disconnection tide that is contributing to one of the lowest phone penetration rates in the developed world. Current efforts to improve the effectiveness of these programs, including a surge of over \$600 million in support for the Lifeline Across America, are being implemented without evidence that they are likely to work, according to Gideon and Gabel.

Garbacz and Thompson (2003) also find that in the U.S. both “untargeted and targeted universal service policies for households during the period 1970-2000 were ineffective, inefficient and generally counter-productive.”

The Mobile Phone’s Role in Safety and Security

One of the drivers behind universal service is importance of communications for health and safety concerns, especially for people living in rural or remote areas. As it turns out, the cell phone is exponentially more valuable and important as a hedge against danger and emergency than the landline phone.

When it comes to citizen safety and cell phones, the presumption is that cell phones provide people with a way to communicate if stranded or hurt, or to report a crime in progress. People anywhere under emergency duress of any kind—even stuffed in the trunk of a car—can call 911 for help. The particular value of the cell phone in this context was fully realized during the 9/11 attacks, when cell phones not only allowed people to say their last goodbyes, but more likely than not prevented a second plane from hitting a key target in Washington, D.C., as passengers aboard Flight 93 learned from the ground about the other planes hitting the World Trade Center.

The Department of the Interior, in its “Safe and Secure” memo, noting that a violent crime is committed every 15 seconds in the U.S., urges people to carry a cell phone and preprogram it to dial the police emergency number (911 or otherwise). “If you hit the preprogrammed 911 button and can’t talk, the police might still be able to find you... Many police departments have electronic locators.” The report suggests that if you don’t have a cell phone, “fake it—if the criminal thinks that you are calling for help, he/she may leave you alone.”

Since the Virginia Tech campus murders in spring 2007, many college campuses have set up emergency texting systems to alert students to danger. Increasingly, public safety officials auto broadcast evacuation information during emergencies to landline and/or cell phones, alerting home owners during the 2007 wildfires in San Diego (landline), or students at St. John’s University campus during a 2007 shooting incident (cell phones).

According to a recent Forrester Research study, approximately 35% of the United State's mobile subscriber population has used text messaging, although texting is largely confined to younger age groups. Given the growing dominance of this communication platform, text messaging provides an additional and viable way for organizations and communities to communicate important information—including safety alerts, preparation procedures and security notifications with students, parents, faculty and staff.

**New Surveys:
The Mobile Phone
as a Safety and
Security Device**

Our own surveys show that the primary importance of a cell phone for the vast majority of owners is for use in an emergency. It's interesting to reflect that the idea of "emergency use" was the rationale that many early adopters gave when spending money on what many perceived to be a luxury item—the question is whether people have that idea ingrained in their perception of a cell phone or whether it is more grounded in reality. Survey results suggest the latter, with a high degree of cohesiveness between the two surveys.

In the ORC survey, 82% said emergency use was extremely important, and 13% said somewhat important. In the TracFone survey, the results were 89% and 9%, respectively. While the ORC responses were uniformly positive across all segments, there were a few groups that were significantly more likely to say yes than others: females more so than males; 45-54 years more so than 55+ (probably due to the higher incidence of teenage children); people from the Northeast and South more so than people from North Central states; and urban more so than rural. Income, education, and household size had no such skews.

Nearly half (48%) said they had used a cell phone to make a call or send a text message in an emergency. College grads were more likely to have done so than high school grads, and those making more than \$75,000 a year were more likely than those making less than \$25,000 a year. Only 20% of the ORC respondents reported receiving a call or text in an emergency.

When asked if they had ever bought a cell phone for a relative to use in emergency situations, 32% ORC respondents said yes; when asked which phone was more important to them in an emergency, 62% of ORC respondents

said a cell phone (and 18% said a cell phone and landline were equally important).

It's interesting to note that if people had to choose one phone to use for all purposes, 58% said they would choose a cell phone (with an overall preference for contract phones)—with college grads and high-income groups preferring contract cell, and low-income preferring prepaid.

The results on the value of a cell phone for safety and emergencies are overwhelmingly uniform, segment by segment, in naming “emergency use” as the primary use of the mobile phone—and in naming the mobile phone as superior in that regard to the landline phone. This carries implications for policy makers. If one of the drivers behind universal service is to insure that people have telephone access in a health or safety emergency, the phone of choice for the vast majority of Americans—young and old, male and female, poor and rich—is a cell phone.

Economic Impact of Cell Phones

It is by now a widespread assumption that increases in telephone penetration (and ICT overall) lead to an increase in labor productivity and national income gains. This is in part because one aspect of telecommunications infrastructure, which distinguishes it from other public infrastructure projects, is the so-called “network effect”: the more users, the more value is derived by those users (as seen clearly by the success of Microsoft’s operating system). The impact of such a network externality—which decreases transaction costs—is that any economic gains deriving from it will not be linear, but will accelerate as critical mass is achieved.

Garbacz and Thompson (Sun Moon Lake Publishers, 2003), comparing the Economic Freedom Index to telephone penetration and universal access threshold (set as 300 mainlines per 1,000 people) as a driver of production efficiency, find that real GDP per worker is a function of telephone access, which “significantly reduces production inefficiency and therefore is conducive to greater productivity.”

The definitive study on the causal relationship between telecommunications and income gains is a study of 21 OECD countries over a 20-year period

(1970-1990) (Roller and Waverman 2001). The paper employs a “two-model technique,” which allows the authors to factor out “reverse causality,” i.e., the fact that an increase in demand for telecommunication services could be a function of economic growth due to other causes.

When controlling for fixed effects (including labor and capital) Roller and Waverman conclude that for the OECD country average over that 20-year span, the impact of telecommunications is .59 percentage points of annual GNP growth. Given that the OECD countries’ GDP grew at a compounded annual rate of 1.96 percent from 1970-1990, they attribute a little less than one-third of growth to telecommunications investment and penetration. While the U.S. and Canada had near-universal service in 1970, Portugal, France, and Italy, for example, had only 6, 8, and 12 phones per 100 people, respectively.

When dividing countries according to low, medium or high levels of penetration, the authors find that with high penetration rates the “impact of aggregate economic growth is substantially larger...in fact, twice as large for the high end as for the low and medium ends.” They conclude that in a country with a penetration rate of 40% (phones per 1,000), which approaches a household penetration rate in excess of 90% (assuming 2-2.5 people per household), the growth rate will be double that of a country with 20% penetration levels, all other factors held fixed. These increasing returns on investment are consistent with the presence of network externalities—and show that the goal of universal service is not only a question of equity, but a recognition of the income-enhancing properties of telecommunications.

Mobile Phones and Economic Gains

In a similar study of developing countries that focuses on mobile phones (Waverman, Meschi & Fuss, 2005), the authors find that “mobile telephony has a positive and significant impact on economic growth, and this impact may be twice as large in developing countries compared to developed countries,” which already have fully-articulated fixed line networks.

Waverman et al conclude that all else held equal, a low-income country with 10 more mobile phones per 100 people than another country would enjoy a per capita growth rate higher by .59 percentage points. The results suggest that long-run growth in the Philippines could be as much as 1% higher than in

Indonesia, were the mobile gap evident in 2003 maintained (the Philippines had 27 mobiles per 100, compared to 9 for Indonesia). This study was followed by a 2007 McKinsey study of telephone penetration in China, which came to virtually the same conclusion.

Consumer Surplus from Mobile Phones

While the two Waverman studies are valid—and their credibility is particularly enhanced since they essentially replicate findings in developed and developing countries—it’s possible they underestimate the added labor productivity that the addition of wireless phones can make to a developed economy such as that of the U.S. In a study for the CTIA on the U.S. wireless telecom industry, Ovum cites the Waverman study as being a “top down econometric” study and asserts the need to consider a “bottom up case study” approach (Entner, R. & Lewin, D., 2005).

To quantify the productivity gains in the U.S. at the firm level, Ovum looked at 8,172 job types involving 132.7 million employees as outlined in the Current Employment Statistics for 2004. Ovum then identified 4,983 job types with 75.8 million employees that would benefit from wireless telecom, although the benefits are hard to quantify.

Another metric is the “consumer surplus,” which measures the amount consumers are willing to pay for an item minus the cost they actually pay. To the extent that it can be accurately measured, the consumer surplus is a clear indication of a product’s value to consumers (which in this case also includes businesses). Here, Ovum estimates a mobile-phone consumer surplus of \$157 billion for the year 2004; previous estimates from other analysts were \$80 to \$150 billion for 2003 (Jerry Hausman), and \$80 billion for 2003 (Thomas Hazlett’s testimony to the U.S. Senate).

Ovum compares the consumer surplus of \$157 billion to the producer surplus of \$10.3 billion, which means that 94% of the total surplus goes to consumers. By contrast, the producer surplus in the U.K., where carriers charge more and achieve twice as much EBITDA as U.S. carriers, the producer surplus is 12% of the total surplus. If U.S. carriers were to charge the same price as U.K. carriers, Ovum contends, the consumer surplus would be cut in half.

**New Surveys:
Economic Impact
of Mobile Phones
in the U.S.**

At the consumer level, the relative importance of telecommunications compared to other possible household expenditures can be gleaned by long-term spending patterns by households in OECD countries. Starting from an Index of 100 in 1990, spending on communications has increased more than that for health, education, housing, transport, clothing and other key categories (OECD, 2005).

Moving beyond the macro-economic impact of ICT on aggregate GNP, this paper strives to answer two micro-economic income-related questions: how do Americans perceive the economic benefits of their cell phones; and, in particular, what benefits do poor and low-income demographic segments in the U.S., which include many recent and illegal immigrants and others with no or low credit ratings, that have relatively low phone penetration rates, attribute to their cell phones? In an age of declining phone penetration rates, the issues are important for policy makers.

Importance of mobile phones for work or business.

When ORC asked respondents to rank the uses of their cell phone in order of importance, 66% said the cell phone was “extremely” or “somewhat” important for work or business. Those who were employed, used contract phones, and had higher incomes were more likely to say yes.

Interestingly, the breakdown segments for the 37% who cited the cell phone as “extremely” important were pretty evenly split across the board—with prepaid and postpaid virtually identical at 36% and 37%, respectively—with slight skews toward the 25-44 age group, males, and African Americans.

Calls devoted to work or money.

Monthly cell phone use is much higher among those who are employed (343.3 minutes) than among those who are retired (178) or not employed (275). When those working full- or part-time were asked if they made phone calls related to work or money, 75% said yes, with a decided skew toward those with more education and higher incomes. As might be expected, respondents in households with less than \$35,000 income said fewer of their calls (20%)

were about work or money than households with incomes of \$75,000 or more (29%)—nonetheless, low income respondents clearly perceive the cell phone at least in part as a work tool. More than half of those from households making less than \$25,000 make calls about money or work, although only 16% attribute actual income to the phone.

Of all those making calls about work, 41% said more than a quarter of their calls were about money. For the 21% of those who said more than half their calls were about work or money, nearly a third (31%) use prepaid phones, compared to 19% for postpaid owners. Again, these callers were more likely to be white collar and well educated. Note, however, that postpaid subscribers typically use far more minutes (331) than prepaid owners (209), who are much more price sensitive. The survey did not distinguish between a personal cell phone and a company owned phone.

The mean percentage of *all* mobile calls about work or money was 27.2%; excluding those who said they don't use their phone for work, the mean was 35.9%.

The mobile phone as money maker.

In the ORC survey, 31% of those working either full- or part-time said their “cell phone has helped make money, get work, or get new customers,” with 43% of men answering yes, and only 16% of women. Surprisingly, (given the likelihood of less education and household income), 43% of prepaid users said yes, compared to just 28% postpaid owners. Far more blue collar (40%) than white collar professionals (27%) say their cell phone has helped them make money. Combining these two findings, intuition suggests that that self-employed blue-collar trades people are more likely to rely on their cell phone as their primary communications device—and choose a prepaid phone because it is less expensive than a contract cell phone.

More than half (62%) of those who had earned money thanks to their cell phone said they had earned more than \$500 in the previous year—and 50% had earned more than \$1,000. More than half the men in the \$500-plus category attributed earnings of more than \$1,000 to their cell phone. The overall average income gain was \$748, and would likely be much higher had

ORC asked respondents to quantify gains of more than \$1,000. (In the Tracfone survey, where respondents were asked to quantify gains up to \$10,000 and above, the average earning was \$2,361.) Although the survey did not distinguish between those who were self-employed and those who worked for employers, intuition suggests that a plurality if not a majority of those attributing concrete income gains were self-employed, or perhaps sales agents on commission.

The Tracfone survey, however, did break out the self-employed (6,018 total respondents) from the total TracFone universe (110,000 respondents). A significant 44.2% of the self-employed call the phone “extremely important” as a work tool, with 30.4% allocating more than half their calls to work, and 41% saying the phone had helped them get work or earn money. And nearly half of those (49.2%) attributed more than \$1,000 in earning to the phone (11.4% earned between \$5,000 and \$10,000; and 10% earned more than \$10,000).

Saving time and money.

Beyond income, both surveys showed clear economic benefits in terms of time and money saved. The same number of people (75%) who said they used the phone for work said the cell phone saves them time. (In the TracFone survey, 75% also said their cell phone saves them time.) Younger people, those with higher incomes, those with bigger families, and those with larger households, are more likely to mention larger time savings. The average amount of time saved per week was 2.6 hours. Those who rely primarily on their cell phone (as opposed to landline) are much more likely to save more than three hours a week.

On saving money, the question was asked only of prepaid phone owners, as the primary reason to use a prepaid phone is to lower costs. In the ORC random sampling survey, 65% of prepaid owners said the phone saves them money, compared to a landline or contract cell phone. In the TracFone survey, 80% said their prepaid phone saves them money, compared to landline or contract cell phones, with a majority (59%) saying they save more than \$25 a month, including 12% who save \$50-\$100. The average monthly savings for TracFone users was \$35 a month, or \$419 a year.

Intuition would suggest that there is little overlap between those who say they are saving money and those who say they are making money, as evidence suggests that using more minutes (and thus spending more) leads to more income gains, but the survey did not tease out that information. Either way, it's important to include time and cost savings in the calculus of overall economic benefit.

The majority (75%) of cell phone owners use the phone for work-related purposes, although it is not the most important function of the phone. The phone is most important as a security blanket in case of emergency, and secondarily as a way to stay in touch with family and relatives. The amount of calls devoted to work or money is a function of whether the cell phone is a primary phone, and a function of the type of work people do. For instance, blue collar workers appear to rely more heavily on the cell phone as a work tool than white collar professionals, which may indicate that they are self-employed. The amount of money people make (and time they save) is largely a function of the number of minutes they use per month (although education levels also play a major role), and because low-income households are more price sensitive, they use fewer minutes and earn less on average. However, because low-income households are the least likely to own cell phones, it is by adding phones in this cohort (less than \$35,000) that the largest income gains would be realized, potentially upwards of \$10 billion or more.

Conclusions

As policy makers struggle to identify ways to increase penetration levels in low-income households, this paper examines the benefits of mobiles phones for low-income households, through a review of the literature and two new surveys.

In an era of exponential growth in the wireless market, the telephone penetration rate in the U.S. is dropping, and now ranks second to last in the developed world. The reasons for this are not clear, but the most plausible explanation is that as more households take out multiple wireless phones, the volatility of monthly bills results in losing both landline and mobile phones. Declining rates of penetration are particularly acute in states with weak consumer protection laws. Although penetration declines are evident across

the income spectrum, those with lower incomes have always had much lower penetration levels, in the 75-85% range, well shy of universal service.

At the same time, more households are relying on mobile phones exclusively. In low-income segments of the population, particularly Hispanics and households with less than \$35,000 income, large numbers are turning to the prepaid phone as their only phone. Whether this is out of choice or necessity is unclear. But it seems likely that many of these households may have lost both landline and wireless phones, don't have the credit to re-subscribe, and adopt prepaid as a way to rejoin the communications grid.

The primary benefit of cell phones is as a security blanket in case of emergency. This is true across the board for all demographic segments, with almost no variation. Similarly, all demographic segments choose the mobile phone as more valuable than the landline phone for emergency use.

A major secondary benefit is economic: income gains because of reduced transaction costs, time savings, and, for prepaid users, money savings over landline and contract cell phones. Clearly, the mobile phone in a developed country will not have the radical and positive accelerator affect it does on the GDP in a developing country, where phone penetration levels are below 20%. However, as more low-income households convert to mobile phones only, and particularly prepaid mobile phones, there is evidence of economic gain at the micro (household) level. And if larger numbers of low-income households were to adopt cell phones and use them productively, aggregate income gains might easily top \$10 billion.

While income gains in our surveys were generally higher at higher income levels, in large part because the affluent can afford to use more minutes, more than half of working households making less than \$25,000 make calls about money or work, and far more blue collar workers than white collar professionals say their cell phone has helped them make money. Similarly, majorities from all income segments cited time savings, with more affluent households saving more time, again a function of minutes used. Prepaid users, who are typically less educated and from lower income households, overwhelmingly cite monthly cost savings compared to landline or contract cell phones.

The overall conclusion is that the cell phone is extremely important to Americans for personal safety, and a huge boon to an individual's economic security. By and large, it is perceived to be more practical than the landline phone by significant minorities and, in some cases, super majorities, depending on the segment interviewed. And for significant percentages of some populations, the prepaid cell phone is their only phone.

Bibliography

- Annenberg Research Network on International Communication. (2004) "The Mobile Communication Society: A cross-cultural analysis of available evidence on the social uses of wireless communication technology," prepared for International Workshop on Wireless Communication Policies and Prospects, Los Angeles, CA.
- Belinfante, Alexander. (2007) "Telephone Penetration by Income by State (Data Through March 2006)," FCC, Industry Analysis and Technology Division.
- Cooper, M.(1996) "A Historical Perspective and Policies for the 21st Century," Benton Foundation and the Consumer Federation of America.
- Crandall, R. and Waverman, L. (2000). "Who pays for universal service? When telephone subsidies become transparent," Brookings Institution, Washington, DC.
- Entner, R. and Lewin, D. (2005). "The Impact of the US Wireless Telecom Industry on the US Economy," a study for the CTIA, Ovum.
- Frieden, Rob. (2005) "Killing with Kindness: Fatal Flaws in the \$5.7 Billion Universal Service Funding Mission and What Should Be Done to Narrow the Digital Divide," Telecommunications Policy Research Conference.
- Gabel, D. & Gideon, C. (2006). "Disconnecting: Universal service on the decline," Unpublished paper.
- Garbacz, C. & Thompson, H. (1997). "Assessing the impact of FCC Lifeline and Link-Up programs on telephone penetration," *Journal of Regulatory Economics*, 11, 67-78.
- Garbacz, C., and Thompson, H. (2003) "Estimating Telephone Demand with State Decennial Census Data From 1970-1990: Update with 2000 Data," *Journal of Regulatory Economics*.
- Garbacz, C. & Thompson, H. (2005). "Universal telecommunication service: A world perspective," *Information Economics and Policy*, 17, 495-512.
- Knittel, C. (2004). "Regulatory restructuring and incumbent price dynamics: The case of local telephone markets," *Review of Economics and Statistics*, 82 (2).
- Ling, R (2004). "The Mobile Connection: The Cell Phone's Impact on Society," Morgan Kaufmann/Elsevier, San Francisco, CA.
- Milne, C. (2006) "Improving affordability of telecommunications: cross-fertilization between the developed and the developing world," Telecommunications Policy Research Conference 2006, George Mason University, Virginia.
- OECD Communications Outlook, 2005, Figure 2.2
- Rosston, G. & Wimmer, B. (2000). "The state of universal service," *Information Economics and Policy*, 12 (3), 261-283.
- Tucker, C., Brick, M.J., Meekings, B. & Morganstin, D. (2004). "Household telephone service and usage patterns in the US in 2004," Mimeo, US Bureau of Labor Statistics.
- Zimmerman, P.R. (2007). "Recent developments in US wireline telecommunications," *Telecommunications Policy* 31, 419-437, Elsevier.