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SMART PHONE WARS

By Robert Hahn and Hal J. Singer

T *The agreement that gives AT&T exclusive rights to distribute the iPhone – the handset that redefined what people expect from mobile communications – has caught the attention of AT&T’s smaller competitors and, by no coincidence, some powerful policymakers in Washington.*

The Federal Communications Commission, which regulates wireless networks, has yet to address the exclusivity issue. But it is under pressure from smaller wireless providers and a number of consumer-advocacy groups to bar a handset maker from signing an exclusive distribution agreement with a wireless carrier. “Restricting advanced handsets to specific carriers is an anticompetitive practice that harms the markets for mobile devices, handset-friendly software applications, and wireless carriage itself,” Jim Chen, dean of the University of Louisville’s law school, told the FCC on behalf of Cellular South.

We disagree. The evidence doesn’t support the contention that the iPhone has a dominant position in the handset market. More important, we don’t think that banning exclusive agreements along the lines of the Apple-AT&T pact in rapidly changing markets is likely to serve the interests of consumers.



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For one thing, such agreements can encourage risky investments in innovative products and services. For another, when dominance does occur in a market subject to rapid technological change, it is typically fleeting: There is now a long history of “dominant” digital technologies – everything from Microsoft’s Internet Explorer Web browser to the MySpace social networking Web site – that failed to check emerging competitors.

THE MARKET FOR HANDSETS AND THE NEXT BIG THING

The first handset for cellular technology networks was introduced by Motorola in 1973. The handset, called the DynaTAC, offered 35 minutes of talk time and weighed 2.2 pounds. In 1983, Motorola brought out a lighter version, with a list price of \$4,000. Six years later, Motorola unveiled the MicroTAC flip phone, weighing 12 ounces and initially priced at \$2,995. *Fortune* magazine predicted that “Portable phones won’t get a lot smaller than this one. After all, they have to reach from your ear to your mouth.”

Needless to say, *Fortune* was wrong. In 1996, Motorola introduced the 3.1 ounce StarTAC. And while the StarTAC led to similar end-of-innovation auguries, it proved no more memorable than a host of handsets that were thinner or more flexible or offered breakthrough features ranging from Web access to text messaging to cameras to MP3 players.

With major innovations in handsets com-

ing from a number of firms, including Nokia, Palm, Research in Motion (RIM) and, of course, Apple, we would expect to see changes in market share over time and the absence of a clearly dominant firm. That tracks what has actually happened in recent years.

Consider first the market niche for “smartphones,” the high-end phones that offer multiple advanced features. While the iPhone got more press, RIM’s BlackBerry Curve moved past Apple’s iPhone to become the best-selling smartphone for non-business users in the United States in the first quarter of 2009. Indeed, Verizon’s introduction of new models and its aggressive marketing pushed RIM’s share of smartphone sales in the United States to nearly 50 percent in 2009, while Apple’s and Palm’s shares declined 10 percent each.

The lack of a manufacturer or model with staying power that could rightly be labeled “dominant” is even more stark when one considers global smartphone sales. Nokia, the industry leader, sold almost four times as many smartphones as Apple did in the first quarter of 2009, but hardly dominates: RIM’s share of the market has grown from 8 percent to 20 percent since 2007, while Nokia’s share has slipped from 47 percent to 41 percent.

Indeed, the only straightforward conclusion one can make about the smartphone segment is that it is unstable. Apple only emerges on the list of leading suppliers in 2008, while Motorola and Palm go from major vendors to distant also-rans. Share shifts have largely been driven by the introduction of models that captured consumers’ imagination – albeit briefly. The big hits: the Blackberry Pearl and Curve, and, of course, the iPhone. Only Nokia seems to have a marketing strategy that yields relatively stable sales; the company offers numerous smartphone models at widely varying prices.

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The picture in the rest of the mobile phone market (which still accounts for over 85 percent of total sales) is quite similar. Nokia is the market leader, yet its share of the market was below 40 percent through the entire 2005-09 period. The fortunes of other makers ebbed and flowed, with Samsung and LG posting big net gains over the period at the expense of Motorola, Sony Ericsson and BenQ Mobile. And there is every indication that other makers are waiting to pounce when the leaders stumble: one handset in four is made by companies with very modest market shares today.

- It syncs easily with Apple's popular iTunes software.
- It supports thousands of applications distributed by Apple's App Store.
- Its touch-screen interface features "multi-touch" capabilities.
- It supports video streaming of media files.
- It runs over a fast 3G data network.
- Its built-in camera allows users to upload images to social networking sites like Facebook.
- It includes a GPS chipset that allows users to pinpoint their locations.

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IS THE IPHONE A MUST-HAVE?

Economists are concerned about exclusive contracts between an upstream input provider (in this case, a handset maker) and a downstream distributor (a wireless carrier) if the excluded input is needed by the distributor's rivals to compete effectively. Inputs that are deemed essential to preserve downstream competition are called "must-have" ones. Although there are a few prominent examples – the rights to broadcast the games of a popular sports team – it is hard to conceive of must-have inputs in telecommunications, where breakneck innovation causes arguably dominant inputs to lose their special appeal very rapidly.

Is the iPhone that special case of a must-have input? Apple's entry into the smartphone market attracted a fanatical following after its debut in the summer of 2007. But none of its features fit the definition of must-have. We identified seven features as the current iPhone's biggest selling points.

iPhone. Four other recently introduced smartphones – the Palm Pre, BlackBerry Storm2, Nokia N97 and HTC G1 – all have GPS chips, digital cameras and touch screens; all sync with iTunes software in one way or another, and all offer video streaming on 3G networks.

The phones are not, of course, identical. The iPhone's touch screen is more sophisticated in function and far more applications are available for the iPhone than for any of its rivals. Indeed, this latter advantage is often compared with the Windows-based PC's advantage over Mac OS X and Linux-based computers.

Windows-based computers retain a commanding share of the business market at least in part because so many applications have been written for the Microsoft operating systems. There are good reasons to believe, however, that the iPhone's lead in applications will narrow fairly quickly. Google's Android



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platform, which is used in the HTC G1, already has thousands of third-party applications, and tens of thousands of developers have downloaded the software-development kit for the Palm Pre.

Competition, by the way, is not only leading to innovative designs comparable to the iPhone, but has also ensured that the prices for smartphones have declined to levels that many more Americans can afford. Apple dropped the sticker price on its earlier-generation iPhone to \$99 in 2009 (upon the introduction of the iPhone 3GS), and Palm reduced the price of its Pre shortly after its introduction.

If competition is alive and well in smartphones, why was Apple able to maintain its lead in the United States for several years? The most plausible explanation is that RIM – the company that makes Blackberrys – stumbled in one round of innovation (and marketing) with the original Blackberry Storm. The applications gap, combined with the manual syncing required to load applications

on the Storm, hardly helped. But there were other problems, too: the screen-based keyboard on the Storm didn't please Blackberry users accustomed to a better QWERTY keyboard. Moreover, the handset's many functions were less intuitive to use than the iPhone's. And, of course, the iPhone was supported by Apple-quality advertising and glitzy Apple stores.

But the fact that the Storm was a disappointment does not mean that the iPhone's market position is permanent. RIM will likely learn from its failures. Indeed, RIM and Verizon introduced the Storm2 in late 2009, which offers better touch-screen input as well as a Wi-Fi alternative to Verizon network access. Meanwhile the new Blackberry Tour, a smartphone that relies on the signature Blackberry trackball and keyboard, has received glowing reviews.

It's worth noting, moreover, that Apple occasionally stumbles, too. In 2005, Apple joined with Motorola and Cingular (now AT&T) to produce the ROKR, a cell phone that synchronized with iTunes and could play



music like an iPod. But the ROKR didn't attract customers. No surprise there: it lacked intuitive controls, carried only a few hours of music, and took roughly an hour to transfer a complete set of songs to the device. Just two years, later, though, Apple was back with the iPhone.

THE LOGIC OF EXCLUSIVE AGREEMENTS

If the iPhone isn't a must-have input – or if its must-have status is fleeting – the exclusive agreement between Apple and AT&T doesn't give the latter the sort of market power that worries trustbusters. Nonetheless, it's worth examining the role for exclusive agreements in the telecommunications industry both because they are common and because there's reason to believe that, contrary to intuition, they serve the interests of consumers.

T-Mobile was the exclusive distributor of Danger's Sidekick (2002), while Motorola's iconic Razr V3 was offered exclusively by AT&T (2004). The Blackberry Pearl was introduced exclusively by T-Mobile (2006), while only AT&T offered the Blackberry

Curve (2007). Indeed, with very few exceptions, most successful handsets in this decade have initially been marketed by a single wireless carrier in the United States.

The reason manufacturers and carriers enter into exclusive contracts is not, on its face, obvious. After all, such agreements impose costs as well as benefits on both parties. Take the iPhone deal. At the time the contract was signed, AT&T had a 30 percent share of the U.S. wireless market. So the agreement meant that 70 percent of wireless customers would have to switch carriers to use the iPhone. And it's tough to get customers to switch. From this perspective, Palm's exclusive deal with Sprint for distribution of the Pre is even more curious, since Sprint controls just 11 percent of the market.

Still, most handsets are, at least initially, sold exclusively by a single wireless carrier. So handset makers must think the benefits of exclusive deals outweigh the costs. And it is plain that the primary benefit for them is risk-sharing. From the perspective of Apple, aligning with AT&T ensured that Apple did



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not bear the whole burden in the event the iPhone flopped.

The agreement also served Apple by ensuring that AT&T would make substantial iPhone-specific investments to back the commitment. Handset manufacturers typically require operators, as part of an exclusive agreement, to commit to investing in techni-



cal support for new handsets – no small thing for an awesomely complex piece of electronics like a smartphone. But the largest commitment that carriers typically make is to subsidize the cost of purchase in hope of earning back the money by selling services. The iPhone debuted unsubsidized, at a price of \$499 (\$599 with more memory). However, to reach beyond the “early adopters” who lined up for hours to be among the first to own Apple’s coolest-ever gadget, AT&T agreed to pay Apple \$300 for each early model, leaving AT&T’s customers to pay \$199 (and, of course, to sign a multiyear contract for network services). For its part, Verizon

paid RIM roughly \$200 toward the \$399 price of the original Blackberry Storm, while Sprint pays Palm at least \$340 for each Pre. And even lower-end phones backed by exclusive distribution contracts can draw \$100 subsidies from carriers.

The iPhone is surely a money-maker for Apple. But the shortcomings of the once-eagerly anticipated Motorola ROKR, RIM Blackberry Storm, and Nokia N97 highlight the uncertainty faced by handset makers introducing new models. Apple reportedly spent \$150 million developing the iPhone, while most of Palm’s \$400 million R&D budget in fiscal years 2008 and 2009 presumably went into the Pre.

Exclusive contracts also facilitate the coordination of marketing efforts between downstream distributors and upstream manufacturers. In the absence of an exclusive agreement, distributors will be hesitant to invest in marketing that will also benefit rival distributors. If, for example, the Blackberry Storm had been available to all carriers, Verizon would likely have spent less to promote it – or simply refused to distribute it.

Note, moreover, that, in this case, what’s good for handset makers and wireless carriers is also good for consumers. By allowing optimal risk-sharing and marketing outlays, exclusivity increases the expected return and thus the pace of innovation.

Exclusive marketing may also allow manufacturers to closely monitor distribution so that the product does not become associated with sellers who might harm the brand. This point is particularly applicable to wireless handsets because the final product is necessarily tied to the network on which it is used.

Thus, through an exclusive contract, a manufacturer like Apple can ensure that its handset is only used on a wireless network that can meet its standards. AT&T, it's worth noting, invested an additional \$2.5 billion in spectrum to accommodate the release of the data-hungry iPhone 3GS.

WHY THE CRITICS ARE WRONG

Critics of exclusive contracts for handsets begin their analysis with a faulty premise – namely that carriers impose the exclusion provisions on the handset manufacturers. Under the traditional paradigm of monopoly-leveraging, a carrier with excessive downstream market power demands exclusivity as a condition of granting access to the carriers' customers. Having secured exclusivity, the carrier then denies the must-have input to its rivals.

But it is often the handset manufacturers that press for exclusive agreements. For example, Apple used the exclusive contract with AT&T as a means to secure control of the iPhone brand. As part of the deal, Apple demanded that AT&T not place AT&T's name on the phone, that AT&T share subscriber revenues, that the iPhone not be made available outside Apple or AT&T stores, and that Apple maintain sole discretion as to whether to repair or replace defective handsets. Apple also insisted that the iPhone's development be secret. (Only three AT&T executives were permitted to see it prior to its release.)

Since AT&T voluntarily signed the agreement, it plainly expected to benefit in spite of Apple's unprecedented inroads into the downstream end of the wireless business. But the agreement was certainly not a unilateral exercise of market power on the part of AT&T. Verizon, the carrier with the largest market share, rejected a similar offer from Apple.

While the story of Palm's deal with Sprint

doesn't show which party was more eager to make it exclusive, there is no evidence that Sprint sought to use the contract as a means of exercising market power. Dan Hesse, Sprint's CEO, said the acquisition of the Pre marked Sprint's "coming-out party": the elite handset would highlight the value of Sprint's reorganized customer service and improved network. Palm, for its part, had been suffering a long drought in sales and, one may presume, was reluctant to bet the farm on its iPhone-fighter.

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THE BIGGER PICTURE

We've focused on competition in handsets. But, with rare exceptions, cell phone consumers buy the whole package – handset, operating system and network services. And while marketing leads the media to focus on the handset portion of the business, much of the innovation that threatens to change the pecking order in wireless communications is coming from other quarters.

As of mid-2009, the wireless carriers were battling to be the first to implement a 4G – fourth generation – wireless network. There are two major 4G technologies in development: LTE (Long Term Evolution) and WiMax. Both promise more speed and versatility, and either could have a momentous impact on the wireless industry. Verizon, AT&T, T-Mobile and MetroPCS are all developing

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LTE networks. Verizon has announced that it will deploy LTE in 2010, while AT&T has indicated that that it will unveil LTE in 2011. Sprint has a joint venture with Intel and Clearwire (a major provider of high speed Internet access) to deploy a 4G WiMax network. The relative success of the rival wireless carriers (along with their handset partners) may well turn on the impact of their versions of 4G on the consumer experience.



The lesson from wireless handsets is pretty clear: in dynamic industries, regulators need to be more tolerant of new technologies that appear to be dominant, or risk slowing innovation.



Meanwhile, innovation in the least visible part of the wireless market, handset operating system software, also has the potential to reorder the wireless landscape. While the full impact of 4G networks won't be felt for years, the next generation of mobile operating systems that will displace Nokia's Symbian, RIM's Blackberry and Microsoft's Windows Mobile OS is just around the corner.

Some of the newest smartphones are based on the open-source Linux OS, which runs everything from servers to cell phones. Open sourcing offers a low-cost alternative to proprietary software and makes it easier for third parties to develop applications for a platform that runs on many different devices. Worldwide sales of Linux-based phones in 2008 were up 19 percent from the previous year,

while the share of the once-popular Symbian operating systems slid significantly. All told, nearly 9 percent of smartphones sold in the fourth quarter of 2008 were Linux-based, up 19 percent from 2007.

In the summer of 2008, Google launched its Linux-based open-source Android operating system with the Open Handset Alliance of 47 telecommunications and technology companies. T-Mobile was the first to offer an Android phone, the G1 from HTC. And a year later, T-Mobile released its second-generation Android phone (called myTouch 3G) in Europe and Asia. MyTouch is a version of HTC's well-received Hero handset, which gives users access to the significant and growing library of apps developed for Android. Google expected that some 18 different Android phones would be available by the end of 2009.

Finally, Linux Mobile ("LiMo") is being developed by an association of 50 technology and telecommunications companies, including Samsung and Vodafone. LiMo differs from Android and WebOS (which runs the Pre); the consortium is focusing on building a flexible platform rather than a user interface. The goal is to cut handset-development costs while leaving phone makers free to create unique user interfaces. Currently, LiMo has over 30 handsets, including several models by Motorola, NEC and Panasonic.

LEARNING FROM PAST MISTAKES

The lesson from wireless handsets (and a half-dozen other telecommunications and IT markets) is pretty clear: in dynamic industries, regulators need to be more tolerant of new technologies that appear to be dominant, or risk slowing innovation. But this has proved an elusive lesson for the FCC.

The agency has at times prematurely declared technologies to be dominant and imposed harmful regulation. In the late 1970s,

it required that wireline (jargon for old-fashioned land-line) telephone companies “unbundle” equipment from services. And in 1981, it extended this requirement to the telephone companies’ cellular operations. Cellular providers affiliated with wireline telephone companies could not sell mobile handsets; nor could they offer certain additional services like voicemail.

In 1992, the FCC acknowledged that competition rendered such regulation unnecessary and allowed the bundling of cellular service and handsets. But for the intervening 11 years, all the potential economies associated with selling handsets and wireless services as a package were lost.

We lack data for U.S. handset sales prior to 1990. But we do know that most of the handsets sold here used the CDMA digital standard, while most of the phones sold elsewhere did not. We also know that CDMA sales were nonexistent in the 1980s, sputtered in the early and mid-1990s, and did not reach 10 million units until 1998. In contrast, the sales of non-CDMA phones reached 10 million units by 1993.

What accounts for this five-year lag behind Europe and Asia? The most plausible explanation is Federal Communications Commission interference, which took the form of banning the joint sale of handsets and services, and holding up incumbent landline operators (who were poised to offer wireless) until another entrant established a foothold.

We are not the first to link the FCC’s regulatory intervention in the mobile handset market to reductions in consumer welfare. Back in 1997, Professor Jerry Hausman of MIT concluded that “regulatory indecision made a new good, cellular telephone unavailable in the United States when it was being offered in Scandinavia and Japan using equipment invented by AT&T Bell Labs.” Hausman

estimated that the delay in making cellular service widely available cost Americans roughly \$25 billion a year.

THE BENEFITS OF FORBEARANCE

Regulators may find it hard to ignore the whiffs of market power given off by muscular players in markets that are routinely shocked by innovation because it is hard to know what good things might have happened if they hadn’t intervened. In contrast, the benefits of intervention are easier to assess, and there is often a constituency that stands to reap those benefits. For example, some small rural carriers argue that terminating the iPhone-AT&T exclusive contract would enable them to offer the iPhone and more aggressively compete with AT&T for customers.

But do small carriers (or AT&T’s giant competitors) need access to the iPhone to compete effectively with AT&T? The question should not be whether a company like Cellular South would benefit from access to the iPhone (it likely would), but rather whether Cellular South needs the iPhone to constrain the price of AT&T’s wireless offerings or to induce rival handset makers to accelerate delivery of competing smartphones. And though the iPhone represented a marketing triumph for Apple and AT&T, there is nothing about it that constitutes a must-have input.

More generally, while regulators look askance at virtually any vertical restraint that leaves rivals out in the cold, the burden of proof should rest with those who claim that consumers (as well as rivals) will be harmed. It is very hard to predict the impact of changing technology or consumer taste, especially in markets in which innovation has a way of redefining the product. And in a world in which economic growth so depends on innovation, the stakes are just too high for regulators to guess. **M**