The Prospects for Graphic Paper

The Impact of Substitution, the Outlook for Demand
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Around the world, many newspapers are struggling for survival—and some are losing the battle. Other print media, such as magazines, books, and catalogs, are also competing fiercely for consumers’ time and money, as well as for advertising revenues. Their main competitors are television and the Internet. Also eroding readership are behavioral trends, such as the tendency to spend more time working and engaging in family activities. In combination, these shifts could have dramatic consequences for paper companies’ sales and profitability.

Traditionally, demand for paper has been driven by growth in gross domestic product (GDP) and population. Today, however, electronic media are causing both direct and indirect substitution effects as consumers buy and read less print media and advertisers transfer their spending from print to electronic media. Both trends will have a significant impact on the pulp and paper industry.

To understand the underlying drivers of media consumption and technology adoption—and thus graphic paper demand—we recently analyzed consumer behavior, advertising trends, and publishing strategies in key markets around the world. We hope that you find our analyses and conclusions useful, and we welcome your comments.

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Before forecasting the future, it is generally prudent to revisit one's own past forecasts, both to check the validity of the forecasting model and to learn from past experience. In 1999, The Boston Consulting Group published a report on the future of paper demand, *Paper and the Electronic Media: Creating Value from Uncertainty*, which examined the threat posed by the substitution of electronic media for print media. Overall, we forecast that generally stable growth in sales of graphic paper would flatten, stagnate, and in some areas even decline by 2003. We predicted that newspapers would be hit especially hard, whereas we expected office paper, inserts, and direct mail to achieve more positive growth.

The report shook the paper industry and was criticized for being too pessimistic. And it did turn out to have been too pessimistic—in terms of population growth and economic development, both of which were stronger than we had expected back in 1999. With regard to substitution, in contrast, we had somewhat underestimated its effects, particularly on the economics of newspaper publishing. So, for example, in the case of U.S. demand for newsprint—the grade hit hardest by substitution—these stronger-than-anticipated forces had the effect of canceling each other out, bringing our forecast relatively close to actual 2003 sales.

Building on our more recent work in the industry, we designed the present study to permit us to forecast global demand through 2020 for all grades of graphic paper except office paper. Specifically, we have forecast demand for newsprint as well as for uncoated mechanical, coated mechanical, coated wood-free, and uncoated wood-free paper—except the shares of those grades used for office paper. In terms of applications, our study explored paper used in newspapers, magazines, catalogs, inserts, direct mail, books, and directories.

Our study focused on eight markets that together account for some 55 percent of the world’s consumption of graphic paper: Brazil, China, Germany, India, Russia, Scandinavia, South Korea, and the United States. Within these markets, we sought to gain a comprehensive understanding of consumer behavior and technology adoption. We analyzed publicly available data in these and other regions and conducted more than 60 interviews with executives in the paper, media, technology, government, and education sectors. In addition, we held numerous discussions within our network of BCG experts.

On the basis of our research and analysis, we developed a detailed model of paper demand and substitution, which we used to forecast worldwide demand through 2020. This model incorporates data such as GDP growth, population growth, and Internet penetration, together with our insights into likely technological developments and trends in consumer behavior in our eight focus markets. Other markets around the world are also reflected...
in our global forecast; we bundled them, together with our focus markets, into 11 regional clusters on the basis of geographical, demographic, economic, and technical factors. We anticipated the multiple impacts of all the factors—including substitution by electronic media—on print applications such as newspapers, magazines, and books, and thence on demand for their respective paper grades. Our model is therefore more reliable in its forecasts of shifts in paper applications than in its forecasts of shifts in paper grades.

Of the various factors affecting the consumption of print media—and thus of graphic paper—direct and indirect substitution by electronic media are most salient. Overall, two criteria determine the degree of direct substitution: availability and switching probability. That is, can individuals access the electronic medium, and if they can, will they use it to replace the existing print medium? Our study identified six drivers of direct substitution: Internet penetration, demographics, functionality, economics, reading habits, and emotional attachment. Of these, the primary prerequisite for direct substitution is Internet penetration, because it allows access to electronic newspapers, magazines, catalogs, books, and directories. All eight of our focus markets saw significant growth in Internet penetration from 2000 to 2005. (See Exhibit 1.)

Indirect substitution entails the displacement of advertising from a print application. In general, as advertisers choose to spend more of their budgets online, there will be fewer ads in print media—

![Exhibit 1. Internet Penetration Exploded Between the Mid-1990s and 2005](image_url)

**Exhibit 1. Internet Penetration Exploded Between the Mid-1990s and 2005**

Sources: The Economist Intelligence Unit; BCG analysis.
and also, therefore, fewer pages for editorial copy. In the long term, lost advertising revenues will undermine many companies’ performance, and some print media players will need to migrate to different business models or they will eventually fail. Already, online classified advertising has severely undercut newspaper revenues in markets such as Scandinavia and the United States.

Drawing on our observations of consumer behavior, advertising trends, and technology, we developed a scoreboard on the perceived usability, reliability, and costs of electronic media versus print applications. The scoreboard, in turn, provided input into our substitution model. We also considered the growing impact of today’s younger generation, which is far more comfortable with electronic media than older generations are. Together, our analyses of all these interrelated factors drove our forecasts of paper consumption in 2020, as described in the following pages.

In general, our analyses revealed that newspaper readership is declining, while TV and Internet use are gaining share. Advertising exhibits a corresponding pattern. We expect Internet advertising to continue to grow as interactivity and customization gain importance. In addition, people tend increasingly to turn to the Internet and television on weekdays for news, while reading more detailed stories in newspapers and magazines on weekends. We expect these trends to continue as well.

Bandwidth and connectivity will be the key technological drivers of substitution. The increasing penetration of broadband technology, which will eventually be equivalent to Internet penetration, is likely to accelerate the shift in consumer behavior. Other innovations—such as electronic paper, 3G mobile phones with enhanced wireless and video capabilities, and media centers that integrate all forms of electronic media, entertainment, and communication functions—might also transform consumers’ media-related behavior, but the jury is still out concerning the penetration, timing, and impact of these developments.

Our modeling of substitution and of demand for graphic paper in 2020 indicates high growth in demand in China and India, driven by increased wealth, population growth, and greater urbanization. Canada, Japan, South Korea, the United States, and Western Europe will all see a decline in demand for graphic paper, driven mainly by a decreasing demand for newspapers, directories, inserts, and direct mail. Paper companies will need to thoroughly understand the key drivers of demand in specific markets and for specific grades of paper, monitor the development of those drivers, and decide on their strategic long-term implications for their businesses.
Media consumption differs widely across our eight focus markets. Nonetheless, in all of them television is a major medium and Internet consumption is significant, whereas newspaper readership is declining. In this section we highlight the salient characteristics of each market.

Brazil

In Brazil, a large segment of the population has low levels of education and income, as well as limited access to electronic media. In fact, fewer than 15 percent of all Brazilians have online access; however, they spend more minutes online on average than Internet users in any other country. Moreover, the profiles of these early adopters of electronic technology tend to match those of print media consumers, so the country is already experiencing a fairly high degree of substitution.

To address this issue, print publishers have started to build digital platforms and to target lower-income readers by using simpler newspaper formats. The latter tactic will likely ensure that a broader portion of the population adopts newspaper reading as a habit. This shift in turn will likely delay the decline in paper demand. In the longer term, as the Internet becomes available to more people, there is a risk that Internet adoption will prompt some consumers—especially younger ones—to “leapfrog,” or to bypass print media entirely and go directly to electronic alternatives.

China

China is experiencing fast growth in technology adoption, driven by both government support and consumers’ interest in computers and the Internet. Users are concentrated in cities and in eastern China. Among all media, the Internet is growing fastest: from 2001 to 2005 the percentage of people using it regularly in the 30 largest cities more than doubled, from 9 percent to 20 percent. Chinese consumers who have online access tend to be active users of the Internet; for people in China’s 30 major cities, the Internet represented 20 percent of their overall media consumption in 2004, outstripped only by television, which accounted for 52 percent. Nonetheless, television and newspapers both have broad reach in China, and consumers view them as the primary sources of information and entertainment. Overall, our analyses indicate that continued strong growth of China’s GDP and population will offset any substitution effects and lead to overall growth in demand for paper.

Germany

Traditionally, Germany has been more conservative than Scandinavia and the United States in terms of Internet use and technology adoption. But...
this is about to change. We expect to see stronger growth in Internet penetration there. Furthermore, we expect that Internet users will be distributed relatively evenly among the German population. Their increased consumption of online offerings will drive down paper demand. Data from Deutschland-Online indicate that the Internet will account for 25 percent of consumers’ total media consumption in 2015, compared with nearly 11 percent today.

India

India has a relatively limited infrastructure supporting Internet penetration. Moreover, there is a huge disparity in that infrastructure between India’s principal cities and its rural areas. While television is still the country’s major medium, literacy and wealth are growing significantly and leading to increased newspaper readership. For example, if literacy continues to expand at the anticipated rate of 2 percent annually, India will see 330 million newly literate adults by 2020. So we expect that growth in print media will strongly outpace electronic substitution in the medium term.

Russia

In Russia there is a large disparity between major cities and rural areas when it comes to media consumption. Digital adoption has grown rapidly, albeit from a small base, and broadband is expected to penetrate the major cities quickly. In 2005, media consumption was highly focused on television and radio (90 percent), with print media accounting for 8 percent and the Internet for just 1 percent of total consumption. A sharp decline in newspaper readership since the 1990s has been caused primarily by public mistrust of media and political apathy. Across all media, Russian consumers strongly prefer entertainment to news.

Scandinavia

In Scandinavia we are seeing the early and widespread adoption of technology as soon as it becomes available and affordable. All countries in this region have experienced relatively rapid Internet penetration over the past several years, driven largely by declining prices for Internet services and improved infrastructure. Currently, consumers still use print and electronic media in parallel; however, consumption of print media is clearly in decline. Newspaper readership is shrinking, and some recently launched magazines survived only briefly. Moreover, several publishers are strengthening their already strong digital positions, and broadband already represents some 70 percent of Internet penetration.

South Korea

South Korea has seen nationwide adoption of the Internet and other electronic media. Consumers are spending a very high share of their disposable income on technology, often on multiple media. They are also willing to forgo both sleep and other media in order to spend more time on the Internet. As a consequence, newspaper readership is declining, and publishers are enhancing their online positions. Despite a contrarian increase in readership of high-end niche magazines, it is likely that the overall substitution of electronic media for print media will continue—especially among the younger generation.

United States

In the United States, Internet use has mushroomed quickly and is now approaching saturation. Together with the steady growth of multichannel television since the 1970s, the rise of the Internet has caused a significant decline in overall paper consumption. Newspapers have been especially hard hit. Moreover, whereas in other countries the decline in print readership has occurred only in younger generations, in the United States it is occurring across all age groups. U.S. consumers appear highly able and willing to substitute electronic media for print. We expect that the decline in overall paper consumption will continue, at least through our forecast period.
A number of trends—both behavioral and technological—will have a significant impact on the consumption of both electronic media and print media. Although for some trends the broad outlines are similar across markets, for others there are notable differences from market to market.

The Growth of the Internet

The Internet is gaining significant share among consumers. For example, from 2002 through 2004 the Internet’s share of all media consumption grew by six percentage points (from 13 percent to 19 percent) in China’s 30 largest cities and by three percentage points (from 6 percent to 9 percent) in Norway. This growth was driven partly by consumers’ increasing access to the Internet but also by changes in their behavior. A number of media experts believe that there is a broad-based trend toward changed patterns of reading: On weekdays, when people have limited time, they tend to stay abreast of current news by means of frequently updated media, such as the Internet and television. On weekends they tend to use their free time to read more deeply about the stories behind the headlines and their implications. Print is still the dominant medium for such weekend reading.

Various studies confirm that consumers tend to use the Internet primarily for information and news, although usage differs from market to market. For example, in China a survey conducted in 2005 revealed that consumers’ main reasons for going online were for information and entertainment. In the United States, exchanging e-mail and browsing the Web for information are the two primary activities, followed by reading news. In Brazil, searching for information and services is the main driver of Internet use.

Despite the importance consumers claim to accord to online news and information, there are few indications that they are willing to pay for these services. The Wall Street Journal’s online news service, with close to 931,000 subscribers in 2006, is one example of a successful subscription news service. Several other newspapers have tried and failed, attracting a relatively small number of subscribers. These include usatoday.com, washingtonpost.com, and nytimes.com, each of which had only between 1,000 and 3,500 subscribers in 2006. Newspapers in the United Kingdom have experienced similar challenges.

Magazines have moved to the Internet more slowly than newspapers. Nonetheless, online editions are increasingly important. Some print magazines sponsor complementary online offerings; examples include BusinessWeek, Elle, and Sports Illustrated. Others, including InternetWeek, closed down their print editions and replaced them with online versions. And some online magazines are entirely independent of print magazines. Examples include
slate.com, which was the twenty-second-most-viewed “current events and global news” site in the United States in December 2006, with 4.9 million individual viewers, and TheStreet.com, which in the fourth quarter of 2006 had 96,400 subscribers, who accounted for 60 percent of its revenues.

**Widespread Access to Television**

Despite differences in wealth, tradition, culture, and infrastructure across our eight focus markets, television is the dominant medium in all of them. In the United States, although the penetration of multichannel television platforms and television sets per household saw a moderate compound annual growth rate of 1 to 2 percent from 2000 through 2005, television—including video and interactive versions—retained a stable 50 percent share of overall media consumption.

In India, television penetration reached 55 percent of households in 2005; it is expected to expand to nearly 80 percent by 2010. In Russia, where television is considered a more trustworthy source of information than newspapers, it represents more than 50 percent of total media consumption. In Brazil, television has traditionally had a very strong position, and more than 80 percent of programming is on open-signal television. The share of households with one or more color TV sets reached relatively high levels in 2000 and has been rising slowly since then. Penetration varies by state in Brazil, reaching more than 70 percent in developing states and 90 percent in developed ones.

Several new technologies will affect the future of television, boosting consumption or revenues. For example, the broadcasting of television over mobile devices such as telephones might increase TV consumption after 2010. Meanwhile, the cost of producing commercials for television is expected to decline—a development that will expand the potential for more targeted advertising in different regions. In addition, TV channels are increasingly realizing new sources of revenue from expanded platforms, including niche channels, sponsorships and product placements, and interactivity linked to online positions.

Other technologies pose threats to revenues. The largest threat comes from ad-skipping technology, predominantly driven by digital video recorders (DVRs). The U.S. experience with the early adopters (the first 5 percent of users) demonstrates that people who have access to this technology use it to spend 60 percent of their TV-viewing time watching programming that they have recorded and saved. In time-shifted mode, they skip some 90 percent of all commercials. Although the early adopters are more eager than the mass market to leverage new technology, ad-skipping technology is likely to reduce television’s share of advertising budgets in the long run. However, it should also be pointed out that televised advertising has survived many a predicted demise over the years as new technologies and networks have emerged. (See Exhibit 2.) Advertisers are expected to develop more interesting and interactive ads, and they will most likely continue to rely on television to reach the mass market.

**The Decline of Newspapers**

In our 1999 report Paper and the Electronic Media, we projected that the newspaper sector would incur nearly half of all losses because substitution by electronic media would take place largely in that sector. Since that time, newspaper readership and circulation have declined across most Western countries—some slipping by as much as 3 percent per year. In Europe the decline in newspaper readership is strongest in the younger generation. In the United States the decline is occurring among both younger and older readers. Data from China’s five largest cities indicate that in 2004, people aged 16 to 30 spent 20 percent less time reading newspapers than people aged 31 to 45, and 29 percent less time than those aged 46 to 65. On the flip side, those aged 16 to 30 spent 26 percent more time on the Internet than the middle group and 53 percent more time than the oldest group. And the youngest group spent almost three times as many minutes on the Internet as they spent reading newspapers.

In some countries, the distribution of free newspapers has slowed the decline in newspaper readership but has also cannibalized traditional newspa-
Free papers appeal particularly to younger readers, who are attracted partly to their easy-to-read content and partly to their convenience and the fact that they cost nothing. Infrastructure development and travel patterns in the larger cities also play a significant role in the rise of these papers. They have been most successful in cities where a large share of the population spends more than 30 minutes commuting to work by mass transit. Naturally, it’s more challenging to distribute free papers to people driving or walking to work.

Political factors also affect newspaper readership. In South Korea, for instance, regulations prohibit newspaper publishers from participating in national broadcasting media and also place a cap on each publisher’s circulation. In Russia, newspapers have lost moral authority: during the 1990s most of them published articles paid for by sponsors supporting Russian privatization. Many people became disillusioned as privatization enriched only a few; in a 2003 survey, 39 percent of respondents said they trusted television as an information source, whereas only 8 percent reported trusting newspapers.

So far, newspaper readership has declined faster than advertisers’ spending on newspaper ads. However, the continuing decline in readership will likely lead advertisers to follow consumers. Significant defections among advertisers will constitute a serious financial blow to newspapers, many of which depend on advertising as their primary source of revenue.
The Rise of International and Niche Magazines

In all eight of our focus markets, the number of magazine titles has increased in recent years. In the developing markets, high-end niche and international magazines are driving this growth. In the more developed markets, the increase in the number of titles reflects efforts by publishers to directly target certain niche markets, such as young parents, specialty-car enthusiasts, and people interested in healthful food. Despite the greater number of titles, consumers in developed countries do not purchase more magazines, so overall circulation remains relatively flat, while markets become more fragmented.

China has recently seen a rapid proliferation of magazine titles, especially consumer titles, driven primarily by the growth of the middle class and supported by a strong advertising market. Foreign titles account for 30 percent of the total but capture 70 percent of advertising spending, leaving local titles to subsist mainly on circulation revenues.

Magazine growth in South Korea and Russia has been similar to that in China. The increase in South Korea is being driven principally by high-end niche magazines and foreign-licensed fashion magazines. However, most magazines in South Korea are losing advertising revenues. In Russia, international titles face little local competition, and their number has increased significantly. Glossy magazines are most popular, with magazines targeted to women now capturing close to 20 percent of all spending on print advertising in the country.

Norway and Germany are just two of several developed countries where the number of magazine titles has increased while overall circulation has stayed relatively flat. In Norway, magazines are increasingly competing with magazine-style inserts that are distributed in newspapers’ weekend editions. The number of weekly magazines is stagnant, while monthly magazines are multiplying: from 1999 through 2004, their numbers climbed at a compound annual growth rate of 11 percent, while circulation expanded at 4 percent. In Germany, from 2000 through 2005 the number of consumer magazine titles increased at a compound annual growth rate of 1.2 percent, while average circulation per issue declined by 1.3 percent.

Although glossy magazines are capturing a growing share of the magazine market thanks to the popularity of international titles, some magazine publishers are attempting to cut costs by trading down in paper quality, moving to less glossy and lighter-weight paper. In our view, it is still uncertain whether many high-end publishers will pursue this strategy, because their advertisers may be accustomed to a certain paper quality and might not want to see it downgraded.

Many smaller magazines are finding themselves economically vulnerable in the face of the increasing fragmentation of their markets and the focus on niche magazines. It is quite possible that the trend already established in the United States and the United Kingdom will broaden to other markets: small niche magazines will discontinue their print editions and launch online versions.

A Swelling Flood of Inserts and Direct Mail

Several countries have seen an increase in inserts and direct mail in recent years. In Sweden from 2000 through 2005, compound annual growth rates for addressed direct mail, unaddressed direct mail, and inserts were 9 percent, 5 percent, and 9 percent, respectively.

The Household Diary Study conducted by the United States Postal Service in 2005 showed a similar development in the United States: growth from 2002 through 2004 of 2.7 percent and 5.7 percent for addressed and unaddressed advertising mail, respectively. This study also showed that Americans in general have a positive attitude toward direct mail and that as many as 80 percent of direct-mail recipients either read or scan it. However, surveys conducted by the Direct Marketing Association in 2005 showed that advertisers were planning a greater increase in spending on e-mail and Web sites than on direct-mail marketing. In addition, increases in
postal rates in the United States in 2006 and 2007 could curtail the volume of direct mail, because it has become more costly compared with electronic alternatives.

Although inserts and direct mail have grown well in the past, their growth will flatten and eventually decline because of the anticipated significant reduction in newspaper circulation, as well as the spread of technology that enables people to decline to receive unaddressed “junk mail.”

**The Uneven Experience of Catalogs**

Our research shows large variations in the experience of printed catalogs, depending on the industry concerned. The travel industry may be a leading indicator of the general direction of change that lies ahead. Across all of Europe, call centers and travel agency retail stores have been closing down as consumers increasingly turn to the Internet as their main channel for booking travel. Tour operator Thomson Holidays, a division of TUI UK in the United Kingdom, revealed in June 2006 that it was selling 50 percent of its vacation packages online.

The changing dynamics of the industry also put pressure on the circulation of travel catalogs. Individual online bookings are cutting into the number of people buying package tours on the basis of printed travel brochures and catalogs. MyTravel, a leading travel agency in Norway, experienced a 15 percent annual decline in the circulation of its travel catalogs between 2000 and 2006. We anticipate a reduction in the number of such brochures printed over the next several years.

Mail-order service is another industry experiencing substitution effects from electronic media. For Arcandor (formerly KarstadtQuelle), a leading German mail-order and department-store company, e-commerce constituted 37 percent of total sales in 2005—up from only 16 percent in 2004. The increase is expected to continue, and the company now aims to garner 50 percent of its sales from the Internet in 2008.

In the United States, the overall volume of printed catalogs increased by a compound annual growth rate of 4 percent from 1998 through 2004. However, we expect U.S. catalogs to follow a downward trend similar to that seen in Europe for travel and mail-order services.

Of course, some industries will develop differently, at least over the next five to ten years. In countries where IKEA, the Swedish furniture and design company, operates, its catalog has become almost an institution. Even in a mature IKEA market such as Norway, the circulation of IKEA’s catalogs increased by a compound annual growth rate of 6 percent from 2002 through 2005, while the catalog’s worldwide circulation increased by 13 percent. An IKEA representative told us that the company is not planning to reduce the catalog’s circulation because, in IKEA’s view, digital catalogs cannot replace physical ones. Like other distributors of direct mail, IKEA faces the challenge of an increasing population declining to receive unaddressed mail. But the company doesn’t give up easily. In Sweden IKEA is distributing stickers that people can put on their mailboxes, saying “No direct mail please, but I’d love to get the IKEA catalog.”

**The Erosion of Information-Based Books**

Sony’s first e-book, launched in 2004 in Japan, was well received in technical circles and named product of the year in 2005 by the Society for Information Display. Nonetheless, the product failed to appeal to consumers, and it was never sold outside Japan. This failure was attributed to a lack of available content due to inadequate digital-rights management (DRM): customers could access the content for just 60 days, and the device supported only Sony’s proprietary file standard. The second-generation Sony e-book, launched at the Consumer Electronics Show in Las Vegas in 2006, contains technical improvements and has better DRM. Expectations for the product are high, and major publishers are positive. In our 1999 report we mentioned e-books as a possible threat to paper; the outcome of this threat is not yet clear.
Meanwhile, traditional reference books, such as dictionaries and encyclopedias, have already lost ground to electronic media. First CD-ROMs and then the Internet have made huge inroads into people’s consumption of this kind of information. Technical, scientific, travel, and educational books will probably follow the same path, as electronic databases continue to develop. The South Korean government, for example, is exploring the idea of publishing all textbooks on the Internet.

In Scandinavia the total number of books sold rose from 2000 through 2005 by a compound annual growth rate of 2.6 percent in Denmark, 6.3 percent in Norway, and 4.4 percent in Sweden, driven mainly by sales of novels and nonfiction trade books and offsetting a decline in educational books and dictionaries. In the United States during the same period, overall book sales were flat, and annual sales through bookselling clubs and mail-order channels declined by a compound annual growth rate of 1.3 percent and 6.7 percent, respectively.

Data for the South Korean, Scandinavian, and U.S. markets show that sales varied significantly from year to year within the study period. The market for novels, in particular, closely reflected the number of bestsellers published. In our view, entertainment-oriented books will experience fewer substitution effects than information-based books, with fiction the least likely genre to migrate online—unless an e-book or a similar device makes a major breakthrough.

The Death of Directories

In Scandinavia, online directories are already a clear winner. From 2002 through 2005, the online revenues of Eniro, the leading directory publisher in the region, increased by a compound annual growth rate of 13 percent, while revenues from the company’s printed directories dropped by 7 percent. In Germany, printed directories still have a fairly strong foothold, but we anticipate considerable online penetration in the next few years, for two reasons. First, broadband penetration in Germany is expected to increase from 20 percent in 2005 to 50 percent in 2010. Second, both traditional and online players are investing heavily in the development of online local-search functions.

We believe that current developments in Europe are only the beginning. Data from one of the large directory publishers in Europe show that for yellow pages, online penetration had already outstripped print penetration by 2006, whereas for white pages online penetration was rapidly catching up to print. Meanwhile, from 2000 through 2005 the circulation of all printed copies dropped by a compound annual rate of 4 percent, while the number of pages per directory also dwindled, yielding a compound annual decline in total printed directory pages of 10 percent. (See Exhibit 3.) Considering the fluidity of the information contained in directories and the increasing convenience and availability of the online option, it seems unlikely that printed directories will survive for long.

In the United States, similarly, we expect that print-ed directories will decline significantly, but their demise will probably take longer than in Europe. The U.S. directory market is currently very fragmented, with some 6,000 distinct editions of yellow pages. Online directories are published primarily by pure online players, leaving only limited potential for print players to migrate to online positions.

In Brazil, printed telephone directories are distrib-uted only to fixed-line subscribers, and the penetr-a tion of fixed lines is shrinking as mobile phones displace them. At the same time, the top five local-search and directory sites in Brazil saw explosive growth in unique visitors per month, up 77 percent from 2005 to 2006.

In China, India, Russia, and South Korea, consum-ers do not commonly use printed directories. Many still use the telephone itself as their primary source for directory information, while CD-ROMs and the Internet are growing substitutes.

The Migration of Advertising

Total spending on advertising is growing in all our focus markets except Germany. The fastest growth
Exhibit 3. A European Example Illustrates How Online Substitution Has Hit Printed Directories Hard

Penetration of online yellow pages has outstripped that of printed yellow pages...

Penetration of white pages...

Circulation of printed directories is falling...

...as is the number of pages per printed directory...

...drastically reducing the total number of pages printed

Sources: A European directory company; BCG analysis.

Penetration is measured by monthly usage.
from 2001 through 2005 took place in Russia, with a compound annual growth rate of 38 percent over the period, followed by India and China, with 20 and 17 percent, respectively. At the other end of the spectrum, Germany experienced a compound annual growth rate of −3 percent during the same period.

In general, advertising has followed consumers. In most markets, television has significantly strengthened its share of advertising spending. The Internet’s share has also grown, but often from a very small base. Newspapers, meanwhile, are generally managing to maintain their customary volume of advertisers, but this volume represents a dramatically reduced share of the total advertising market.

In India, from 1994 through 2003, advertising expenditures climbed at a compound annual growth rate of 15 percent—and print’s share of those expenditures declined from 60 percent to 39 percent, while television’s share swelled from 30 percent to 43 percent. This trend will very likely continue: a UBS report published in October 2005 anticipated that television penetration in India would expand from some 50 percent in 2004 to 80 percent in 2010. Meanwhile, advertising on the Internet, while growing, constitutes only a small share of overall advertising in India: in 2003 it amounted to some $3 million out of the $2.2 billion total, or 0.14 percent. Nonetheless, various forecasts indicate that spending on Internet advertising will grow to some $14 million by 2009.

Similar trends prevail in Russia. In 2005, television commanded the largest share of media advertising expenditures (47 percent), followed by outdoor advertising (19 percent), magazines (12 percent), free newspapers (10 percent), other newspapers (6 percent and declining), and radio (5 percent). The Internet commanded only 1 percent of total advertising expenditures, but its share is rising rapidly, at a compound annual growth rate estimated at some 40 percent from 2004 through 2008. Television enjoys such a large share of advertising expenditures primarily because it offers significantly lower and more measurable cost per thousand exposures than any other media channel. However, this advantage is about to erode: television’s advertising prices are currently increasing three times as fast as print prices, and a new Russian law limiting the number of minutes of television advertising per hour will very likely push prices even higher.

The United States exhibits a different pattern. There, too, television is the major advertising channel (34 percent share), closely followed by newspapers (30 percent share). But the Internet had already won a solid, nearly 7 percent share of the market in 2005 and is expected to continue to strengthen. Although display ads still account for the largest share of Internet advertising, paid search ads and classifieds have been the largest drivers of growth. A paradigm shift took place in the U.S. market for classified ads after 2000: help-wanted classifieds in newspapers dropped precipitously, and classified ads in eBay outnumbered those in all U.S. newspapers combined. (See Exhibit 4.) This trend could have dramatic consequences.

In South Korea, Internet-based advertising is strengthening from a small but perceptible base. Such advertising increased at a compound annual growth rate of nearly 40 percent from 1994 through 2004, capturing a 6 percent share of the country’s total advertising expenditure during this period. In recent years, search ads have grown more than twice as fast as banner ads. One reason for this rapid growth is that search ads have created an entirely new market because South Korean national daily newspapers never carried classified advertising. Another reason is that search ads appeal to local business owners because the initial fee is small, and they are charged only when an interested searcher clicks on their ad.

Across the world, the growth of Internet advertising is driven not only by consumers’ media habits but also by new opportunities. It is easy to monitor the extent of customer exposure to a particular online ad by tracking the number of clicks it receives. Moreover, in addition to offering an effective cost model, Internet advertising also increasingly supports interactivity and triggers curiosity among consumers. For example, sites are increasingly using banner ads that turn into interactive ads when a user moves the cursor over the ad.
Implications for Publishers

In response to all these trends, publishers are adopting various strategies to defend their print positions. First, they are seeking to retain their current readers by broadening their current product offerings. In several of our focus markets, this strategy includes components such as publishing newspaper supplements, expanding the number of pages in the publication, and including more local and targeted content. The Swedish tabloid newspaper Expressen now includes several topic-specific supplements each week. The Times of India gives away the tabloid Mumbai Mirror free of charge, although it normally costs two rupees. And Russia’s Izvestia, among other newspapers, includes a New York Times digest as a supplement in its Monday edition.

Publishers are also trying to expand their customer base through new channels and products. Free newspapers offer one way to attract new readers and keep advertisers. In some countries, the distribution of newspapers and magazines free of charge—for example, to hotels—is also increasing. In Brazil many publishers have started to target low-income readers with cheap products and customized content.

At the same time, publishers are intensively cutting costs. In addition to slashing their overhead costs, they are narrowing the margins on their printed pages to accommodate more text per page, trimming or eliminating some costs for graphics and design, and streamlining production processes.

To survive and thrive in the long run, however, publishers are not only defending their print posi-
tions but also strengthening their online positions. The Scandinavian media group Schibsted, which publishes several of the major newspapers in the region, has pursued this strategy quite successfully. It has some of the most visited Web sites in Scandinavia and in recent years has launched new initiatives in search ads, classifieds, and online newspapers. As a result, in 2004 its margin on earnings before interest, taxes, and appreciation (EBITA) from digital positions amounted to 28 percent of sales, and online activities now account for one-fourth of the group’s total EBITA.

As publishers of print media build stronger online positions, they will be increasingly willing to give up their traditional print channels. Thus, it is likely that countries where traditional media companies are pursuing this strategy will experience a faster decline in print media.
How Technology Is Changing Behavior

Major events can spur the adoption of new technologies and the demise of older ones. For example, in the United States during 1990 and 1991, televised coverage of the Persian Gulf War—supported by cable TV that reached more than half of U.S. households—contributed to a continuous decline in newsprint consumption per capita. Since then, cable TV penetration has grown steadily. (See Exhibit 5, page 22.)

The terrorist attacks on the United States on September 11, 2001, are another example. In August 2001, 22 percent of U.S. online users said that they had read news online the day before, and 64 percent said that they normally read news online. In the days after the attacks, 27 percent said that they had read news online the day before, and the share of online users regularly reading news on the Internet grew to 70 percent. Interestingly, the increase was not a short-term effect. Online users in the United States did not return to their previous reading habits after the attacks; rather, the share of this population getting news online stabilized at the new level—and continued to grow.

The Importance of Bandwidth

Bandwidth and connectivity will be key drivers of substitution. Already, broadband penetration is outpacing dial-up connection in both developed and developing countries; this shift is being driven by falling prices—in combination with increasing urbanization and literacy, improved infrastructure, and technological developments. As more and more people gain access to broadband, and as Internet offerings proliferate, Internet penetration will continue to grow significantly over the next 10 to 15 years, especially in developing countries. Eventually, almost all online users will access the Internet through broadband connections. For example, in 2005 more than 39 million households in the United States had access to the Internet through broadband connections; by 2009 this number is expected to grow to 62 million. In the same period, the number of households with dial-up connections will shrink from about 41 million to about 31 million. In Brazil, while the number of Internet users is expected to increase by a compound annual growth rate of 5 percent from 2005 through 2009, the number of broadband subscribers will grow by 20 percent. (See Exhibit 6, page 23.)

Broadband is not the only source threatening print media. Various technologies—such as 3G cards, Wi-Fi, and WiMAX—increase bandwidth and mobility in electronic media, thereby enabling consumers to connect to the Internet when traveling, even in areas with limited fixed-line infrastructure.

The Question of Mobile Phones

So far, there are few indications that mobile phones are achieving nearly the levels of substitution for
print media attained by online news sites. For example, the most visited online news site in Norway, VG Nett, has more than ten times as many users as VG Mobil, the WAP equivalent. In the United States, market data show that fewer than 10 percent of mobile phone subscribers have used their mobile phones to obtain news or to download information.

However, today’s mobile phones are better suited to electronic media consumption than their predecessors were. The newer devices are more user-friendly, faster, and equipped with more sophisticated applications that enable their users to read newspapers, watch TV, listen to the radio, and even take high-quality photographs. Nonetheless, because television sets and desktop and laptop computers offer superior visibility and usability, mobile phones are likely to supplement existing media rather than become a significant substitution technology.

The Prospects for Electronic Paper

An electronic paper display (EPD) is a thin, lightweight device on which readable text can be made to appear with paperlike, high-contrast visibility and ultralow power consumption. EPDs, which use 100 times less energy than laptops, are enabled by electronic ink—that is, ink that carries a charge and can be updated through electronics. The EPD itself can be either flexible or inflexible, depending on the backplane used in the device. Its readability is close to that of traditional paper, even in strong light conditions, and the images that appear on it are entirely stable. In addition, it is highly mobile.

Exhibit 5. The Year 1990 Marked a Clear Tipping Point for U.S. Newsprint

Sources: The Economist Intelligence Unit; FedStats; RISI; BCG analysis.

*The demand estimate is based on the historical relationship of newsprint to GDP from 1960 to 1980.
Several players are involved in developing electronic paper and advancing its use. E Ink, iRex Technologies, Plastic Logic, Sony, and Toppan Printing are all driving the development of the device itself or parts of it, and several publishers—including De Tijd, Ifra, and HarperCollins—are pushing the development of content for electronic paper. All these players share high expectations for the technology.

However, electronic paper still faces both technological and commercial challenges. The devices’ color, size, flexibility, costs, and business model all require better solutions if electronic paper is to succeed commercially. Moreover, history shows that technical innovations need time to reach critical mass. Ten years after their respective introductions into the U.S. market, color TV sets had penetrated less than 10 percent of households, home personal computers around 20 percent, and mobile phones close to 40 percent. More recently, adoption curves have shortened because of higher network effects, a proliferation of complementary technologies, shorter product life cycles, and faster time to market. Broadband, for example, achieved more than 50 percent penetration of the U.S. market ten years after it was introduced.

The future of electronic paper remains unclear. We believe that it is likely to penetrate the market eventually but do not foresee its posing a large threat to paper in the medium term.

Exhibit 6. Broadband Will Eventually Replace Dial-up Connection in Many Countries

Sources: The Economist Intelligence Unit; Global Entertainment and Media Outlook, 2006–2010, PricewaterhouseCoopers, June 2006; Brazilian Institute of Geography and Statistics (IBGE).

* Estimates are for 2006 and beyond.
* The number of broadband subscribers was equivalent to approximately 6 percent of Brazilian households in 2005.
Our analyses have shown that print media—especially newspapers—will be the losers across our focus markets. In all these markets, television will remain the dominant medium, at least for the next five to ten years. The Internet is growing significantly, albeit from a very low base in many countries. Advertisers are following consumers to electronic media, although with some time lag. And technology will permit even wider and easier access to electronic media in the future. So what is the outlook for paper?

Global Demand for Paper in 2020

Our forecast of paper demand in 2020 is based on our understanding of media consumption, the underlying drivers of consumer behavior, advertising trends, and technology innovation and adoption. We are cautious regarding the precise accuracy of these forecasts but confident about the directions they indicate.

We estimate that global demand for graphic paper (excluding office paper) in 2020 will be between 80 million and 90 million tons. To arrive at this forecast, we have used our model to estimate demand for each paper application in each of 11 regional clusters, which we have defined in terms of geography, demographics, economies, and technology.

Demand by Region. Demand for paper will vary widely among regions. In general, from 2005 through 2020, demand will grow fastest in China and India, driven by increasing wealth, population growth, increased literacy, and urbanization. Western Europe, Canada, the United States, Japan, and South Korea will all experience significant declines in demand. Demand in Australia and New Zealand will also drop, but with much lower impact on worldwide consumption. Latin America, Central and Eastern Europe, members of the Commonwealth of Independent States, and Malaysia and Taiwan may see some growth in demand over the next few years, but by 2020 they are likely to be back at or very near their current levels. (See Exhibit 7.)

Demand by Application. Paper demand by application will also vary widely. It is unlikely that newspapers will be able to reverse the declining trend in North America, Western Europe, and Asian countries such as Japan and South Korea. In contrast, in countries such as China and India, substitution will be offset by underlying growth in the demand base. In general, newspapers, inserts, and direct mail will take the biggest hits, along with directories, which we expect will practically disappear by 2020.

The development of magazines, catalogs, and books is less certain. Magazines’ consumption of graphic paper is likely to stay relatively level, sustained by growth in international and niche titles and support from advertisers. We expect catalogs
Exhibit 7. China and India Will See the Most Growth in Demand for Graphic Paper

Source: BCG’s proprietary model of graphic paper demand and substitution.
Note: Graphic paper includes all grades and applications, excluding office paper.
to experience a minor decline overall, while books will see a small upward trend, despite the decline in textbooks and traditional reference books. (See Exhibit 8.)

**Demand by Paper Grade.** Our analysis shows that newsprint and mechanical paper will experience the greatest decline owing to the anticipated decrease in circulation of newspapers, directories, inserts, direct mail, and catalogs. Wood-free, coated, and uncoated grades will maintain relatively flat demand because of the slight increase in books and flat circulation for magazines.

However, there are large uncertainties related to demand for various paper grades. In our approach, we have used media consumption trends and the threat of substitution by electronic media to develop our estimates of paper demand. We have not assessed in detail potential shifts in paper grade mixes but rather used current mixes as a proxy for future ones. If the coming years bring new technologies that provide new functionality to any of today’s paper grades, if advertisers start demanding different grades, or if economics push publishers to trade down in quality, any of these developments will also affect the mix in demand in 2020.

**Exhibit 8. Newspapers, Inserts, and Direct Mail Will Decline, and Directories Will All but Disappear**

![Graph showing consumption of graphic paper for different media](image)

**Source:** BCG’s proprietary model of graphic paper demand and substitution.

**Note:** Graphic paper includes all grades and applications, excluding office paper.
Sensitivity Analysis and Early-Warning Indicators

Several developments may cause the demand for paper to rise above or fall below our estimates. We have conducted a set of analyses to understand the likely impacts of these developments.

- GDP growth will have the largest impact on demand. If the compound annual growth rate of real GDP per capita from 2005 through 2020 were to increase by 1 percent over our assumed levels, worldwide demand for paper would increase by 11 percent—or close to 9 million tons—compared with our baseline estimates.\(^1\)

- Changed Internet penetration would have considerable impact. If worldwide Internet penetration were 10 percent higher than we anticipate, worldwide demand for paper would be lower by some 3 million tons—or almost 4 percent—compared with our baseline estimates.

- The possible introduction of new technology, including the accelerated penetration of electronic paper devices, would cause significant uncertainty, especially for newspapers and books.

- How successfully publishers defend their print positions and develop new online markets will also affect future demand. However, their defensive tactics will mainly delay or accelerate substitution, rather than prevent or eliminate it.

Uncertainty in forecasts calls for monitoring. We recommend that paper companies build their own frameworks and systematically follow the development of several factors, such as GDP growth, population growth, broadband penetration, literacy rates (especially in developing countries such as India), trends and economics in the advertising industry, and breakthroughs in new technology. Only in this way can companies identify disruptive trends early on. Because paper is a capital-intensive industry, requiring relatively long payback times for investments, paper companies need to define their views of future demand and begin acting on them as early as possible.

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\(^1\) For each of the countries studied, BCG based its assumptions about the rates of growth in GDP on forecasts provided by The Economist Intelligence Unit.
In recent years, declining markets in some regions and for some paper grades, overcapacity, increasing costs of energy and fiber, downward pressure on prices, and substitution have all contributed to low profitability for paper companies. Every year since 1999, BCG has conducted an assessment of value creation among more than 1,000 public companies across different industries worldwide. The 2007 Value Creators Report, Avoiding the Cash Trap: Achieving Superior Value Creation in an Era of Excess Cash, shows that the paper industry has created significantly less total shareholder value than the total sample. In particular, decreasing margins and lower sales growth are lowering total shareholder value.

On the basis of our analysis and forecast of paper demand for 2020, we have defined four strategic challenges that paper companies should address in order to ensure maximal value creation over the next 10 to 15 years.

Understanding your particular value-creation opportunities. Before aiming for renewed growth, it is important to fully understand the company’s levers for value creation: is your challenge primarily a lack of growth, or is it insufficient profitability? For many companies, the first priority will be to ensure the satisfactory profitability of current assets. In many cases, this will mean operating in radically different ways, such as significantly reducing the complexity in the operation of assets, approaching markets in new ways, or targeting competitors’ profit sanctuaries.

Identifying the specific drivers of development in your core markets and crafting your strategic responses. In our view, there is little doubt that mature markets such as North America and Western Europe will experience stagnating or declining demand for many grades of graphic paper. Newspapers, especially, will suffer from this trend, but it will also take a toll on other paper applications. Companies need to understand specifically how much they will be affected and to review the drivers of demand in their grades and markets, rather than relying on the aggregated market forecasts. The pressure to reduce overcapacity will likely intensify in some grades, and it is important for paper companies to choose the right pace for restructuring. Part of the answer will be to develop reasonable investment plans that permit the exploitation of current assets and market positions without requiring capacity-adding investments. Companies with a major interest in these mature-market regions will have the opportunity to follow various basic business models, such as acting as a consolidator, cost leader, or niche finder.

Developing your overall plan for capturing growth in emerging markets. China and India, which are expected to see compound annual growth rates of 3.5 percent and 6 percent, respectively, in graphic paper demand (excluding office paper) for the next 10 to 15 years, merit
special attention. Paper companies should consider how to participate in this growth without suffering unduly from overcapacity, high energy and fiber costs, or pressure on prices. The key will be to choose the optimal business model to cope with issues such as uncertain sources of raw materials and lack of infrastructure in some areas.

**Communicating with investors.** Setting a new course that combines restructuring in declining markets and investing to capture growth requires some long-term thinking. So it is highly important that paper companies thoroughly understand their investors’ priorities when defining their overall strategy. Similarly, it is critical to develop a comprehensive plan that can be communicated easily and convincingly to investors.

This is the second major report that BCG has published on the effects of substitution on demand for graphic paper, and the overall outlook has not improved. Nevertheless, we are not spelling doom for the paper industry. On the contrary, we see an evolving industry landscape that includes vast differences among countries and grades, a landscape in which there is some shadow but also much light.

In the past, the industry has suffered from too generic and overly optimistic forecasts. These have sometimes led participants to formulate inadequate strategies and make incautious investment decisions. Today the industry should not fall into the opposite trap of seeing only gloomy prospects. We encourage players to develop their own meticulous and carefully differentiated assessments of what will happen in particular regions and grades, to acknowledge their specific risk profiles, and to craft appropriate strategic responses.

While some Western European and North American segments will remain under pressure, other segments in these regions will continue to grow, both within and beyond graphic paper. And even in segments that are under pressure, we have seen highly successful, value-creating strategies. Moreover, there are ample opportunities in other regions—not only China and India—where levels of graphic paper consumption are still just a small fraction of those achieved in Western Europe or North America.

Finally, we believe that this industry will be all the stronger for facing the challenges head-on, seeing both the threats and the opportunities clearly, and choosing to tackle them with energy and vision.
For Further Reading

The Boston Consulting Group publishes other reports and articles that may be of interest to senior executives in the paper industry and related areas. Recent examples include:

**Avoiding the Cash Trap: Achieving Superior Value Creation in an Era of Excess Cash**
The 2007 Value Creators Report, September 2007

**Organizing for Global Advantage in China, India, and Other Rapidly Developing Economies**
A report by The Boston Consulting Group, March 2006

**“Spurring Innovation Productivity”**
Opportunities for Action in Industrial Goods, November 2005

**“The New Economics of Global Advantage: Not Just Lower Costs but Higher Returns on Capital”**
Opportunities for Action in Operations, July 2005

**“Globalizing R&D: Building a Pathway to Profits”**
Opportunities for Action in Operations, May 2005

**“Globalizing R&D: Knocking Down the Barriers”**
Opportunities for Action in Operations, May 2005

**“Avoiding Supply Chain Shipwrecks: Navigating Outsourcing’s Rocky Shoals”**
Opportunities for Action in Operations, March 2005

**The Central and Eastern European Opportunity: Creating Global Advantage in Serving Western Europe**
A Focus by The Boston Consulting Group, January 2005

**Navigating the Five Currents of Globalization: How Leading Companies Are Capturing Global Advantage**
A Focus by The Boston Consulting Group, January 2005

**Capturing Global Advantage: How Leading Industrial Companies Are Transforming Their Industries by Sourcing and Selling in China, India, and Other Low-Cost Countries**
A report by The Boston Consulting Group, April 2004

**“What Is Globalization Doing to Your Business?”**
Opportunities for Action in Industrial Goods, February 2004
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The Prospects for Graphic Paper
The Impact of Substitution, the Outlook for Demand